IIPPE Training Workshop

Value and Price

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27 March 2017
(am session)

Room B102 (Brunei Gallery), SOAS, London

The Fundamental Question

- Consider a class society in which a surplus is produced
- Suppose this society is also a market economy in which the voluntary buying and selling of commodities is the norm
- Can we construct a theoretical account that at the same time
  1. demonstrates and explains exploitation?

  and
  2. understands competition and prices?
- The same issue put differently:
  - are Marxian theories of exploitation and competition compatible?

Structure of Knowledge I

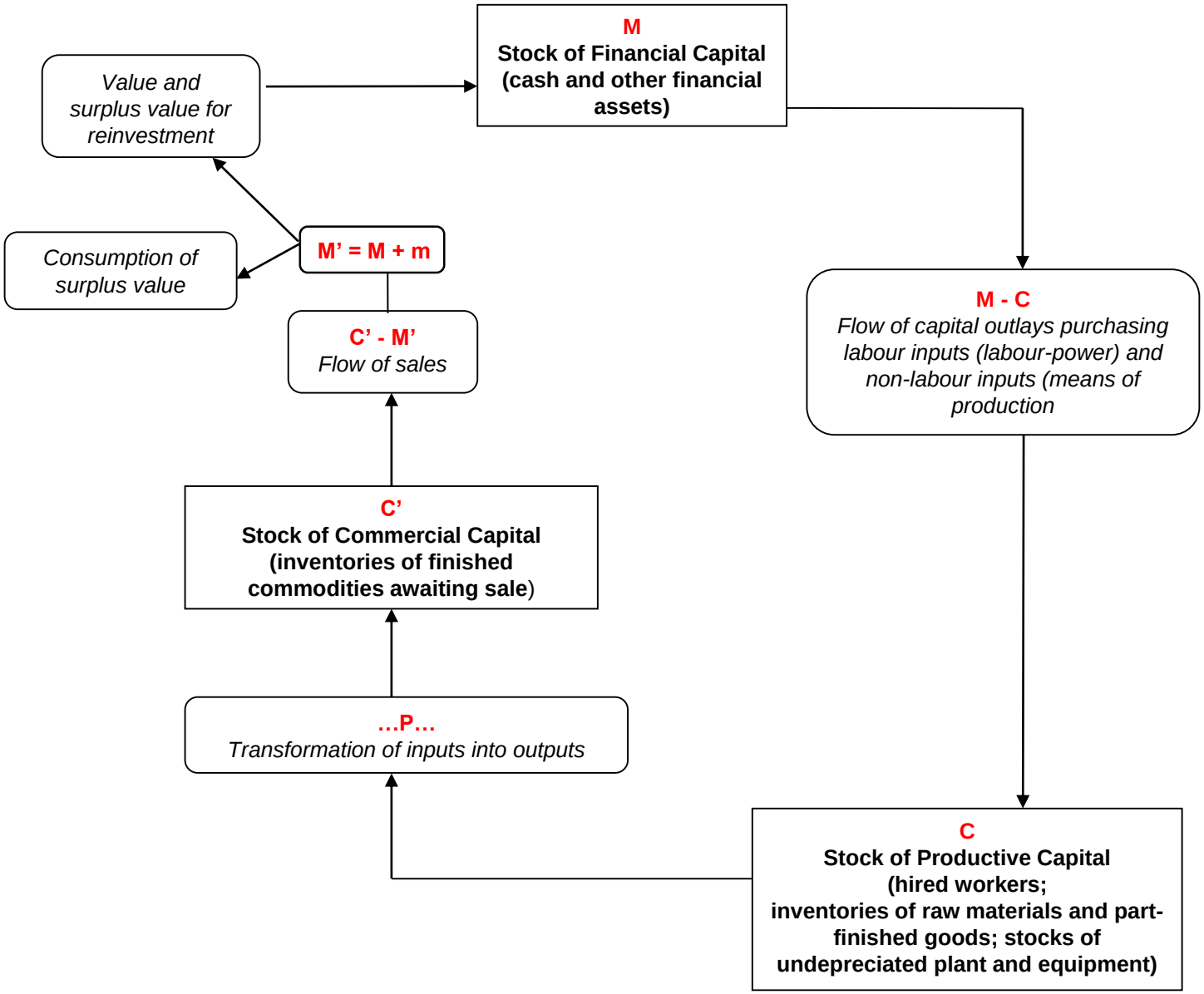
- Basic elements: abstractions or determinations
  - aspects of reality
  - abstract from whole complex of factors that make up some actual concrete instance
- Abstractions are layered or ordered:
    - concrete to abstract (to formulate the theory)
    - abstract to concrete (to expound and develop the theory)
  - starting points important in establishing meaning
    - how theory is explained is different from how it is constructed

- Abstractions constituting a theory define each other
  - set of ideas concerning value comprise a self-determined system
  - all theories have this self-determined character
    - difficult to understand concepts outside system comprising all of them
    - makes critical stance difficult
      - cf sympathetic criticisms and hostile criticisms

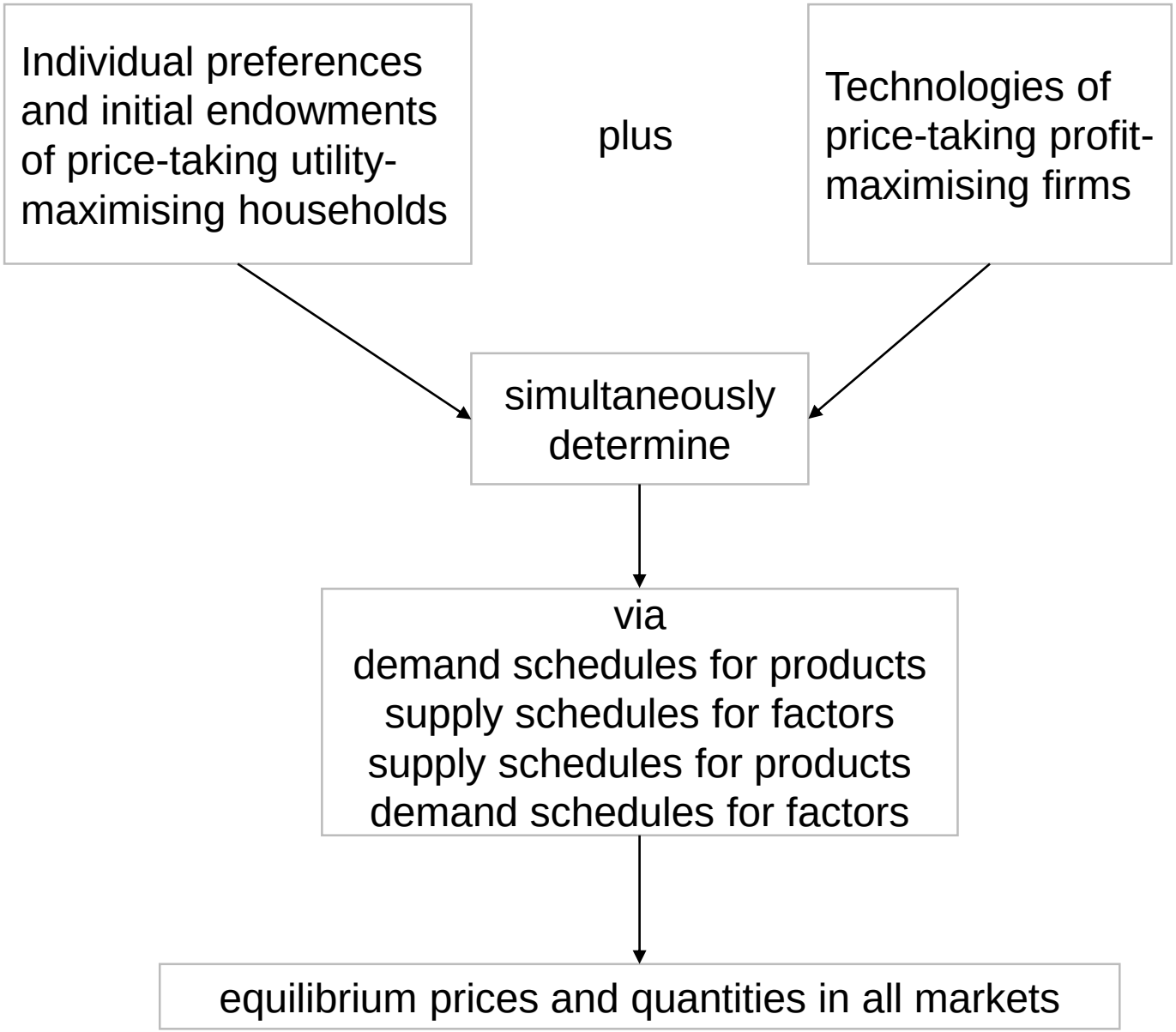
Structure of Knowledge II

- Marx's abstractions or determinations
  - purpose:
    - to understand historical specificity of CMP
  - abstractions:
    - value, labour, money, commodity
- Rival visions:
  - neoclassical economics
    - purpose:
      - to explain resource allocation in any society
    - abstractions:
      - preferences, technology, endowments
  - post-Keynesian economics
    - purpose:
      - to explain causes and consequences of growth in capitalist economies
    - abstractions:
      - empirically-based behavioural relationships in specific institutional contexts in real historical time

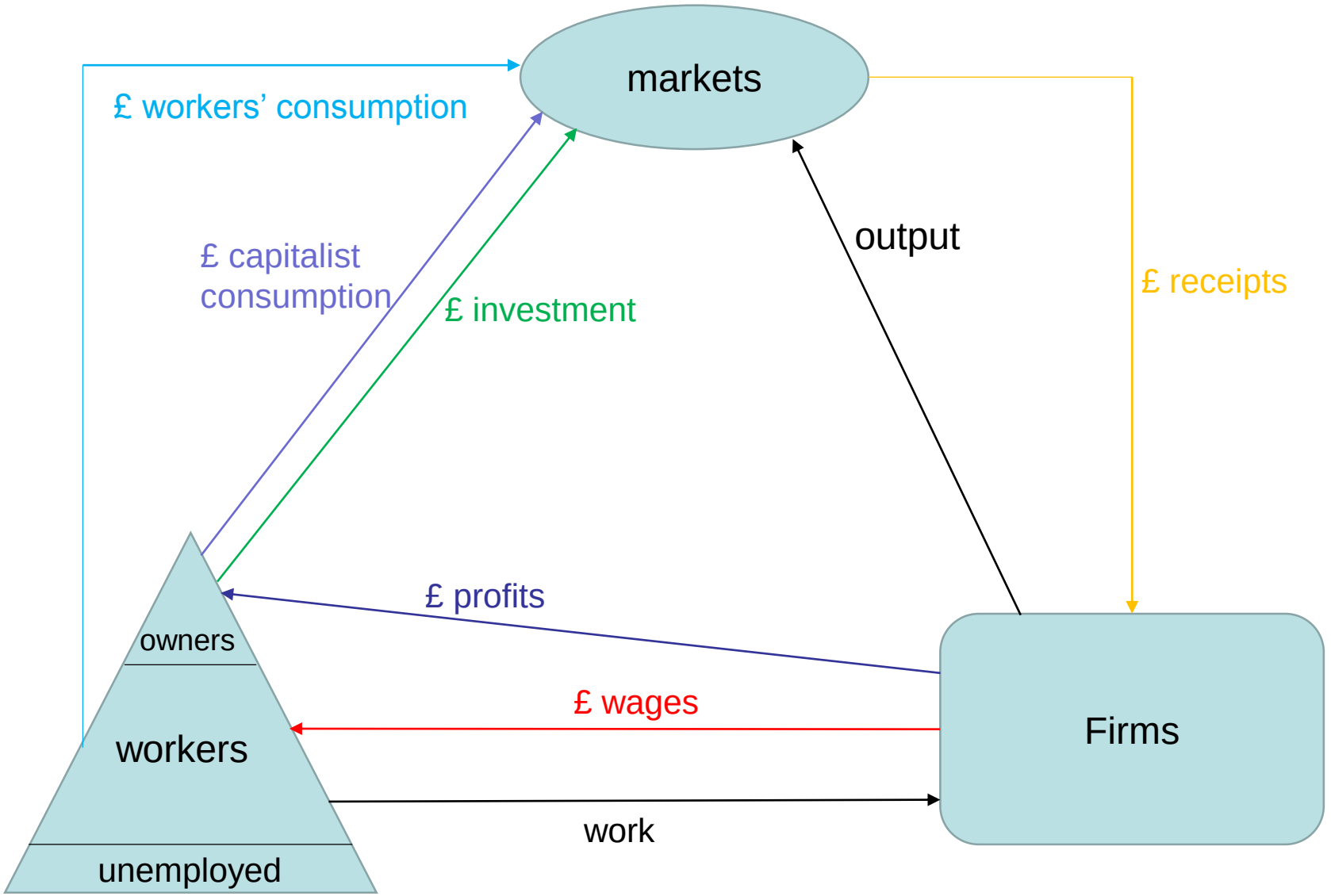
Marx: Circuit of Capital



Cf: Neoclassical Economics



Cf: Post-Keynesian Economics



Theory and Causation

- Basic activity of science lies in explaining phenomena
  - explanation: causal account of phenomena we want to explain
    - if we understand causes of something, we might better be able to control it

- Different accounts of causation
  - empiricist
    - Hume: causation = temporal succession and regularity
      - explanation ≡ prediction
  - realist
    - focus on underlying (invisible) mechanisms
      - explanation ≠ prediction
        - » because we don't (can never?) know enough (geology of earthquakes)
        - » because randomness built in (Darwinian natural selection)
  - denial
    - Althusserian focus on overdetermination

Explanation and Prediction

- What is a good explanation of something?
  - use the ordered set of abstractions (determinations) constituting the theory to understand the phenomenon, so that
    - the phenomenon is reproduced by the way in which the determinations of the theory interact
    - the fundamental determinations continue to operate
- In this sense, reality is determined
  - explained *ex post* by the theory
  - given the causes of the phenomenon, ‘necessary’ or ‘inevitable’
- Does not mean future is predetermined
  - after something has happened, all of its determinations have occurred and so are known
    - still disputes in historical explanations
  - in the future we have no way of knowing all the active determinations, even if we believe we know some of them

What Did Marx Mean? Hegelian Tradition

- Hegelian tradition
  - through observation, we first become aware of what happens as contingent possibilities
  - only later, through theoretical analysis, do we understand the full determinations of these real cases
  - in that sense, what is ‘possible’ is developed by theory into something that is ‘necessary’
    - what actually happens has special status

- So explanation of patterns of capitalist development emerge out of the framework of the theory
  - in that sense, these patterns are ‘necessary’
    - different meaning of terms from everyday sense
    - different from deduction from axioms

Basic Structure of Marx's Theory

- Consider societies in which production is organised through exchange: commodity production
- Special laws (ie fundamental determinations) arise in such societies, arising out of dual nature of exchanged commodities
  - use-value (any society has useful products)
  - value: property of exchangeability with other commodities
    - unique to commodity production
    - created by labour
    - appears as exchange-value, in form of money
      - money is value separated from any particular commodity
- Source of value added of total mass of commodities produced is the labour expended in producing them
  - labour theory of value
  - inherited from Smith and Ricardo

Adam Smith

- Crucial feature of society
  - mobility of producers
- Long run level of price
  - determined through competition among producers
  - equalizes rate of return across all activities
  - called the 'natural price', a long run equilibrium price
  - different from 'market price'
    - day-to-day fluctuations caused by all sorts of ephemeral and contingent factors
  - essentially postulate of **'capitalist law of exchange'**
- Problem of the theory of value
  - determination of the natural prices of commodities
    - ie determination of long run equilibrium prices

Smith and the Labour Theory of Value

- "Early and rude state of society" before "the accumulation of stock [Smith's technical term for non-labour inputs] and the appropriation of land"
  - 'mobility' of labour presumed (in hunting for deer and beaver)
- Natural price determined by difficulty of production
  - difficulty measured by labour hours required for production
- Primitive **"commodity law of exchange"**
  - a labour theory of value (ltv): price corresponds to labour-time
    - in unit terms, for commodity *i*, $$p_i = \frac{l_i}{\lambda_m}$$
      - » so that for commodities *i* and *j*, $$\frac{p_i}{p_j} = \frac{l_i}{l_j}$$
      - » ratios of labour-times = corresponding ratios of natural prices

Smith and Capitalism

- Organization of hunting process later takes capitalist form
  - capitalists hire hunters
  - capitalists supply hunters with hunting implements
  - capitalists pay landowners for hunting on private land)

- Then Smith's simple ltv becomes problematic
  - why?
    - revenues from production have to cover more than wages
      - capitalist requires a return on capital (invested in both labour and non-labour inputs): profit
      - landlord requires a return on ownership of land: rent
    - 'labour commanded' (revenues) > 'labour embodied' (wages)
  - so for Smith, labour embodied does not work as an explanation of 'natural prices'

Smith's Second Theory of Price

- Faced with need to include rent, wages, and profit in his account, Smith abandoned his labour embodied theory

- Instead, proposed an adding-up theory
  - natural price of commodities explained by adding up labour costs, land costs, and capital costs
    - these costs evaluated at natural wage, rent, and profit levels

- Requires an independent determination of natural wage, rent and profit levels
  - but no such independent theory in Smith
  - hence enmeshed in circularity
    - prices determined by costs
    - costs determined by prices

Prices and Invisible Hand

- Smith did not manage to work out natural price interpretation of rent, wages and profit
- But very clear that differences between market price and natural price entailed quantity adjustments
  - market price fluctuations around levels determined by natural prices
    - natural prices = centres of gravity for market prices
- Invisible hand process was one of
  - continual adjustment towards an equalized rate of profit
  - continual displacement as technology and demand evolved
- Hence endless arbitrage process
- Natural price = value substance underpinning market price
  - but once Smith had abandoned his embodied labour theory of value, he had no satisfactory theory of natural price levels

Genealogies of Price

- Smith's two theories of price were the ancestral foundations of all subsequent theories of price
  - contemporary neoclassical economics traces its genealogy back to Smith's adding-up theory
  - Smith's immediate successors focused on developing his embodied labour theory of value
- Both theories presume labour and capital mobility

Smith: A Balance-Sheet

- Smith's successes
  - a more or less explicit capitalist law of exchange (theory of competition)
    - definition of natural price
      - price that supports an equalised rate of profit
    - distinction of natural price from market price
      - market prices fluctuate around natural prices
      - natural prices are centres of gravity for market prices
    - arbitrage process (invisible hand)
  - a primitive commodity law of exchange (crude ltv)

- Smith's failure
  - couldn't apply ltv to a capitalist economy

Ricardo's Generalisation I

- Ricardo generalised Smith's ltv to an economy in which
  - 'stock' had been accumulated
  - land was privately owned
- Prices were determined by

  labour actually performed (direct or living labour)

  + labour embodied in nonlabour inputs (indirect or dead labour)
  - assumes that different types of labour (different skills and intensities of work) can all be reduced to common standard unit
    - Ricardo paid little attention to how this might be done

- Then, measuring in this common standard, we have "commodity law of exchange" applied to capitalist economy
  - for individual commodity:

    price = value (embodied labour) ÷ value of money
  - implies relative prices determined by embodied labour ratios

Ricardo's Generalisation II

$$p_i = \frac{\lambda_i}{\lambda_m} \quad \Rightarrow \quad \frac{p_i}{p_j} = \frac{\lambda_i}{\lambda_j}$$

where $$\lambda_\iota = \sum_{j=1}^{n} \lambda_j a_{ji} + l_i$$

Note: a_{ji} is called an input-output coefficient, representing amount of commodity *j* necessary to produce 1 unit of commodity *i*

- value = indirect (dead) labour + direct (living) labour

Ricardo's Problem

- Ricardo's prices were Smith's natural prices

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

price = (nonlabour costs + labour costs)(1 + *r*)

[note: labour mobility ⇒ uniform wage rate per hour *w*]

- However, Ricardo soon discovered that
  - determining prices by embodied labour

  and
  - considering these prices as the 'natural prices' at which profit rates were competitively equalised as *r*

  was not logically possible

Example I

- Technology (in terms of per unit of output):
  - direct labour l_1 working with means of production
  - these means of production were produced one period previously, and only with direct labour l_2

- For capitalist:
  - advance wl_2 at beginning of previous period
  - earning $wl_2(1+r)$ at end of that period
  - advance $wl_1 + wl_2(1 + r)$ at beginning of current period
  - earning $\{wl_1 + wl_2(1 + r)]\}(1 + r)$ at end of current period

Example II

- Consider 2 competing production processes, producing commodities *A* and B respectively
  - suppose competition equalises rate of profit between the 2 processes
- Given the technology, price equations are

$$p_A = (1+r)[wl_{A1} + (1+r)wl_{A2}]$$

$$p_B = (1+r)[wl_{B1} + (1+r)wl_{B2}]$$

- Suppose A and B
  - are each produced by identical quantities of embodied labour:

    $l_A = l_B$ where $l_A = l_{A1} + l_{A2}$ and $l_B = l_{B1} + l_{B2}$

    $\Rightarrow$ identical values and hence natural prices
  - have production processes differently divided as between direct and indirect labour: $l_{A1} \neq l_{B1}$ eg $l_{A1} > l_{B1}$

Example III

$$p_A = (1+r)[wl_{A1} + (1+r)wl_{A2}]$$

$$p_B = (1+r)[wl_{B1} + (1+r)wl_{B2}]$$

$l_A = l_B$ where $l_A = l_{A1} + l_{A2}$ and $l_B = l_{B1} + l_{B2}$ and $l_{A1} > l_{B1}$

- Then, if $p_A = p_B$, rate of profit accruing to each capitalist cannot be the same
  - rate of profit on capital invested in the production of B will be lower
  - this contradicts definition of natural price as supporting an equalized rate of profit
- Conversely, if the rates of profit *are* equalized, then prices that bring this about cannot reflect total labour embodied in production of each commodity
  - natural price of commodity B must be higher
    - because capital tied up for longer
  - this contradicts the embodied labour theory of value

Example IV

- Prices:

$$p_A = (1+r)\left[wl_{A1} + (1+r)wl_{A2}\right]$$
$$p_B = (1+r)\left[wl_{B1} + (1+r)wl_{B2}\right]$$

- Ricardo's LTV:

$$\frac{l_A}{l_B} = \frac{p_A}{p_B}, \quad \text{or} \quad \frac{l_{A1}+l_{A2}}{l_{B1}+l_{B2}} = \frac{l_{A1}+(1+r)l_{A2}}{l_{B1}+(1+r)l_{B2}}$$

- Under what conditions does LTV hold?
  - LHS has to equal RHS. How so?
  - $r = 0$

    not a capitalist society
  - time structure of labour embodied identical for A and B

$$\frac{l_{A2}}{l_{A1}} = \frac{l_{B2}}{l_{B1}}$$

in general this will not be true: ratios of means of production to labour (whether in use-value or value terms) will be different

$$\text{RHS} = \frac{l_{A1}+(1+r)l_{A2}}{l_{B1}+(1+r)l_{B2}} = \frac{l_{A1}\left[1+(1+r)\frac{l_{A2}}{l_{A1}}\right]}{l_{B1}\left[1+(1+r)\frac{l_{B2}}{l_{B1}}\right]}$$

$$\text{LHS} = \frac{l_{A1}+l_{A2}}{l_{B1}+l_{B2}} = \frac{l_{A1}\left[1+\frac{l_{A2}}{l_{A1}}\right]}{l_{B1}\left[1+\frac{l_{B2}}{l_{B1}}\right]}$$

Did Ricardo Find a Way Out?

$$p_A = (1+r)[wl_{A1} + (1+r)wl_{A2}]$$

$$p_B = (1+r)[wl_{B1} + (1+r)wl_{B2}]$$

$$\Rightarrow p_A/p_B = [l_{A1} + l_{A2} + rl_{A2}] \div [l_{B1} + l_{B2} + rl_{B2}]$$

- Since problem was generated by different structures of production, maybe there is some commodity that has an 'average' structure of production
- then its value
  - determined only by total labour directly and indirectly embodied
  - so could be used as 'invariable standard of value'
    - invariable to changes in *w* (and hence *r*)
    - distributional relations could be analysed independently of prices

Ricardo and Sraffa

- Ricardo never found what he was looking for
- Turns out to be rather complicated problem
  - for a given technique of production, Sraffa's 'standard commodity' generally considered to have solved Ricardo's analytical problem
  - but across different techniques no such invariable standard of value has been discovered
- Much contemporary empirical work in political economy supports Ricardo's conjecture (ltv 93% correct) that differences between natural prices and embodied labour ratios are not very large
  - all such investigations rest on some particular measure of deviations of one relative price system from another
    - no agreement on any one method to measure these differences
  - Shaikh emphasises that time structures of embodied labour are not so different (vertical integration an 'averaging' process)

Ricardo: A Balance-Sheet

- Ricardo's successes
  - applied ltv to means of production
    - so a commodity law of exchange for capitalism
  - held on to both commodity law of exchange and capitalist law of exchange

- Ricardo's failures
  - never considered the nature of the labour underlying ltv
  - had no notion of class other than as recipient of type of income
  - couldn't resolve logical difficulties entailed in applying both commodity law of exchange and capitalist law of exchange

Marx's Corrections of Ricardo: How do We Understand a Commodity Theory of Exchange?

- Ricardo's LTV: source of value of a commodity produced is the labour expended in producing it
- Marx refines concept of labour
  - labour that produces value is
    - abstract rather than concrete
    - simple rather than compound
    - social rather than private
    - necessary rather than wasted
  - homogeneity of commodities as exchange-values reflects fact that production of any commodity requires a certain fraction of the total (abstract, simple, social, necessary) labour-time of society
    - exchange-value represents an amount of homogeneous social labour-time (abstract labour)
    - abstract labour appears as exchange-value (form of value)
- Since prices are expressed in monetary units, money expresses abstract labour
  - theory of value, theory of price, theory of money inseparable

Fundamental Relation

- Marx begins with a commodity theory of exchange
  - simple labour theory of value
  - assumptions
    - labour mobility
    - equivalent exchange
  - p_i = unit price of commodity *i* (in units of gold)
  - λ_i = unit value of commodity *i* (in units of hours)
  - λ_g = unit value of unit of money (in hours per unit of gold)

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

- Could write this equivalently as

$$p_i = \lambda_i * [monetary\ equivalent\ of\ labour\text{-}time]$$

ie: price in gold = [value in hours]

* [what each hour is worth in terms of gold]

$$\frac{1}{value\ of\ money} = melt$$

Implications of the Fundamental Relation

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

- Conservation principle (value conserved in exchange) enables answers to 2 questions:

  – how much labour time does a £ represent? Equivalently, what is the value of money?

    value of money = labour value added ÷ money value added

    [dimension is hours per £]

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

  – how much value in £ does an hour of labour time create?

    monetary expression of labour-time (*melt*) = 1/value of money

    [dimension is £ per hour]

$$\frac{1}{\lambda_g} = melt = \frac{p_i}{\lambda_i}$$

Application: Value of Labour Power

- Capitalist buys labour power for its price in £, called the wage (*w*)

$$w\,(\text{per hour}) = \frac{vlp\,(\text{per hour of labour hired})}{\lambda_g}$$

so that $$vlp = w\lambda_g$$

- If value conservation applies to all commodities individually, prices of commodities bought with *w* (wage-bundle of commodities) are determined in same way. Per hour:

$$\text{w} = £\,(\text{wage-bundle}) = \frac{\text{value of wage-bundle}}{\lambda_g}$$

- Assume workers do not save. Then substituting for *w* in $vlp = w\lambda_g$

$$vlp\,(\text{per hour}) = \text{value of wage-bundle (per hour)}$$

  - So *vlp* is value of consumption goods necessary to (re)produce LP

A Digression

$\mathbf{p} = (p_1, p_{2,} ....., p_{i,} ....., p_n)$, a (row) vector (or list). Similarly for $\boldsymbol{\lambda}$.

$\mathbf{x}, \mathbf{y}$ and $\mathbf{l}$ are also vectors (lists) but written in columns.

$\mathbf{A}$ is a matrix (with n rows and n columns);

a_{ij} is the element in the ith row and jth column.

$\mathbf{x} = \mathbf{A}\mathbf{x} + \mathbf{y}$ is a system of n equations, of which the ith is

$$x_i = \sum_{j=1}^{j=n} a_{ij} x_j + y_i$$

Multiply through by p_i

$$p_i x_i = p_i \sum_{j=1}^{j=n} a_{ij} x_j + p_i y_i$$

Sum over all commodities:

$$\sum_{i=1}^{i=n} p_i x_i = \sum_{i=1}^{i=n} p_i \sum_{j=1}^{j=n} a_{ij} x_j + \sum_{i=1}^{n} p_i y_i$$

This can be written much more compactly using matrices and vectors:

$$\mathbf{p}\mathbf{x} = \mathbf{p}\mathbf{A}\mathbf{x} + \mathbf{p}\mathbf{y}$$

Application to Total Value Added

$$\mathbf{py} = \frac{\boldsymbol{\lambda}\mathbf{y}}{\lambda_g}$$

- This conservation of total value added is of course a simple consequence of aggregation, starting from

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

- Interpretation of this aggregate relation:
  a) social abstract labour is distributed across the different production processes that together produce net outputs;
  b) prices are means by which this distribution is effected;

  so that

  c) prices are bearers of social labour time

Marx's Macroeconomics

- On basis of equivalent exchange (conservation of value across exchange), Marx analysed
  - how capital (any sum of money invested in order to make more money) creates surplus-value in the production process
  - how surplus-value creates capital as an accumulation process
- In modern terminology, a macroeconomic approach
  - all individual capitals:
    - treated qualitatively as identical
    - differ only in quantity
      - any individual capital is representative of all capitals: 'capital in general'
- Analysis of 'capital in general' sufficient to expose and analyse the most fundamental determinations
  - enables sharp focus on economic categories representing class

Capitalist Law of Exchange I

- But freedom of markets entails competition
  - individual capitals pursue highest profit on their investments
  - entails mobility of capital
    - in addition to previously presumed mobility of labour

- If capitals are perfectly mobile, competition must ensure an equalized rate of profit on average over repeated production periods

Capitalist Law of Exchange II

- Assume commodity law of exchange (ltv) applies
  - labour mobility enforces uniform rate of surplus-value
- Capital-in-general exists as competing capitals
  - competition requires capital mobility
- Each capital has technologically different production process
  - some will be highly mechanized, employing very little labour
    - so producing very little new value
  - some will be very labour-intensive, employing a lot of labour
    - so producing a lot of new value
  - for the same investment, rates of profit must differ if the commodity law of exchange applies
  - but process of competition rules this out
- Therefore, back to Ricardo, prices at which each capital would earn same *r* cannot be prices-proportional-to-values

Capitalist Law of Exchange III

- No reason to presume equalization of *r* is actually achieved
  - rather a tendency, continually disrupted by empirical contingency
- Prices at which *r* is equalized called *prices of production*
  - same as Smith's natural prices when capitalist employers determine distribution of labour among branches of commodity production (CIII, Penguin ed. p.300)
- Determination of prices of production is the *capitalist law of exchange*

- Labour mobility and 'commodity law of exchange'
  $\Rightarrow$ theory of exploitation and uniform rate of surplus-value
- Capital mobility and 'capitalist law of exchange'
  $\Rightarrow$ theory of competition and equalised rate of profit
- Can the theories of exploitation and competition be combined?

Marx's Corrections of Ricardo: Aggregation

- Marx often not explicit about level of aggregation
  - frequently explains aggregate behaviour of a system by discussing a typical or average element of it
    - when he writes about individual commodity, means typical, average commodity
    - whole of CI: written in terms of a typical or average capital, meaning aggregate capital (or scale model of aggregate capital)

- Interpret Marx as altering location of LTV
  - reference is level of aggregate production of commodities (or the average commodity), and not in each particular commodity
  - to arrive at this, his exposition begins with an individual commodity
  - I.e. he begins with the individual and concludes by showing the principles derived hold for the aggregate, not the individual
    - can easily confuse

Marx's Approach

- Prices (of production) at which each capital would earn the same rate of profit ≠ prices-proportional-to-values
  - exchange: not equivalent exchange but non-equivalent exchange
    - then value is realized at prices of production in different sectors from where it was produced
      - competition among capitalist firms effectively (re)distributes surplus-value among the sectors of commodity production
- In the aggregate, value is conserved
- For each individual commodity exchange: unequal exchange
- Clear and meaningful framework that Ricardo (and Smith) never achieved
  - Ricardo had realised that it was not just embodied labour that mattered, but the time-structure of that embodiment
  - Marx formulated this in terms of the composition of capital: the proportions in which capital is advanced as constant and variable
- But which aggregate of value is conserved?

Where Is ‘Equal (or Equivalent) Exchange’ Located?

- If we start with equal exchange, then ‘commodity law of exchange’ holds for each and every commodity
  - so it holds for all aggregates

- But we know exchange has to be unequal because of different compositions of capital (Marx) or time structures of embodied labour (Ricardo)

- Suppose we start with equality of aggregates
  - then we can have unequal exchange in individual exchanges
    - on summation the individual deviations will net out to zero
  - fundamental determinations derived in *Capital* I represent aggregate (or average) behaviour

- But which aggregates?

Total Value Added

- Apply basic formula to total net product **y**
  - price is **py**
  - value added is $\boldsymbol{\lambda}\mathbf{y}$, so: $\mathbf{py} = \dfrac{\boldsymbol{\lambda}\mathbf{y}}{\lambda_g}$
  - but total value added = total number of (paid) hours worked *H*

$$\mathbf{x} = \mathbf{A}\mathbf{x} + \mathbf{y} \quad \Rightarrow \quad \boldsymbol{\lambda}\mathbf{x} = \boldsymbol{\lambda}\mathbf{A}\mathbf{x} + \boldsymbol{\lambda}\mathbf{y}$$

$$\boldsymbol{\lambda} = \boldsymbol{\lambda}\mathbf{A} + \mathbf{l} \quad \Rightarrow \quad \boldsymbol{\lambda}\mathbf{x} = \boldsymbol{\lambda}\mathbf{A}\mathbf{x} + \mathbf{l}\mathbf{x}$$

$$\therefore \boldsymbol{\lambda}\mathbf{y} = \mathbf{l}\mathbf{x} = H$$

  - so: $\mathbf{py} = \dfrac{\boldsymbol{\lambda}\mathbf{y}}{\lambda_g} = \dfrac{H}{\lambda_g}$
  - in the aggregate actual losses and gains of new value in exchange must sum to zero, because all losses are exactly matched by gains

Historical Changes in Domestic and International Monetary Arrangements

- Marx's gold standard day no longer relevant
  - commodity theory of money is no longer applicable

- So we must also change λ_g into λ_m

- How then do we understand the value of money (and its inverse, the *melt*)?

$$\mathbf{py} = \frac{H}{\lambda_m} \quad \Rightarrow \quad \lambda_m = \frac{H}{\mathbf{py}} \quad \text{and} \quad melt = \frac{\mathbf{py}}{H}$$

Marx's Correction of Ricardo: Conservation of Value Added

- Fundamental conservation principle of LTV:
  - in whole system of commodity production, value added is produced by labour (*H*) and conserved in exchange (**py**)
- Marx represents this for the individual commodity as an assumption of equivalent or equal exchange
  - usual justification: to show capitalism is an exploitative system even if each commodity owner receives the full value of the commodity she sells
  - in the aggregate it is a conservation principle: value added is neither gained nor lost in the process of exchange
- At the individual level, equal or equivalent exchange poses the possibility of unequal or non-equivalent exchange
  - not in Smith and Ricardo
  - lies at the heart of Marx's resolution of the logical difficulties of combining commodity law of exchange with capitalist law of exchange
- If *py* interpreted as *NNP* (or similar), and *H* is total hours (of productive labour) worked, Marx's ltv is immediately operationalisable

An Empirical Example

- USA 2010:

  py = \$9,876.4 billions

  H = 99,329 million hours

$$\mathbf{py} = \boldsymbol{\lambda}\mathbf{y}\frac{1}{\lambda_m} = H\frac{1}{\lambda_m}$$

$$(9{,}876.4)*1000 = 99{,}329\frac{1}{\lambda_m}$$

- How much value in \$ does 1 hour of labour-time create?
  - ie: what is the "monetary equivalent of labour-time" (*melt*)?

$$\text{melt} = \frac{\mathbf{py}}{\boldsymbol{\lambda}\mathbf{y}} = \frac{\mathbf{py}}{H} = \frac{(9{,}876.4)*1{,}000}{99{,}329} \approx \$99.4\,\text{per hour}$$

- How much labour-time does \$1 represent?
  - ie: what is the "value of money"?

$$\lambda_m = \frac{\boldsymbol{\lambda}\mathbf{y}}{\mathbf{py}} = \frac{H}{\mathbf{py}} = \frac{99{,}329}{(9{,}876.4)*1{,}000}$$

$$\approx 0.0101\,\text{hours per \$} = 32.6\,\text{seconds per \$}$$

Coverage of the Commodity Law of Exchange

- Is the commodity law of exchange only an aggregate conservation principle?
- Is there an individual commodity for which the commodity law of exchange applies? That is, at this level of abstraction,
  - is there an individual commodity exchange that is systemically unaffected by considerations of different structures of production (ie different compositions of capital)?
  - is there an individual commodity whose price is proportional to its value?
  - is there an individual commodity whose exchange for a sum of money is in general an equal or equivalent exchange?
  - is there an individual commodity for which the capitalist law of exchange does not apply?
- Were there to be such a commodity, it would have to be a very peculiar one

Labour-Power

- A peculiar commodity
  - an aspect of human beings
  - reproduced outside of capitalist relations
  - not produced in a capitalist-organised production process
    - no composition of capital involved
    - no rate of profit involved
  - so considerations of unequal exchange (forced by competitive equalisation of rate of profit) do not apply
  - so basic formula of commodity law of exchange applies:
    - price = value ÷ value of money

$$w\,(\text{per hour}) = \frac{vlp\,(\text{per hour of labour hired})}{\lambda_{\text{m}}}$$

or

$$vlp = w\lambda_m$$

Value of Labour-Power I

- USA 2010
  - w = \$25.06; and since $vlp = w\lambda_m$
    then vlp = (25.06)*(0.0101) ≈ 0.25
  - so for each hour of work, worker gets 0.25 of what is produced, and capitalist gets 0.75
  - for each \$ of new value produced, worker gets 25 cents and capitalist 75 cents

- Can be put a different way:

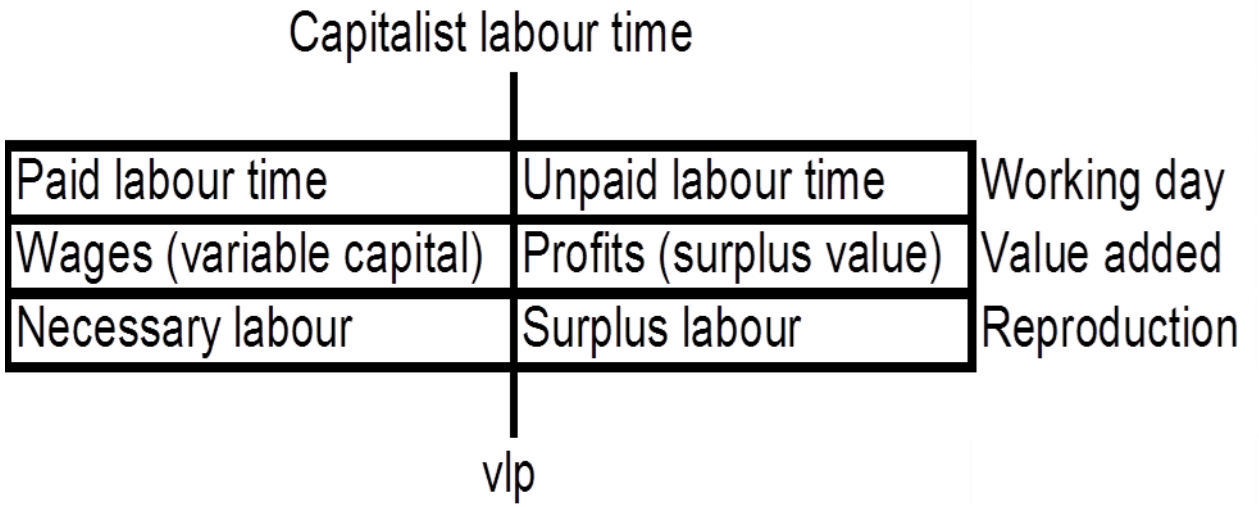
$$vlp = w\lambda_m, \text{ and since } \lambda_m = \frac{H}{\mathbf{py}}$$

$$vlp = \frac{wH}{\mathbf{py}} = \frac{W}{Y}$$

  - nb: wage share of productive labour (0.25), not all labour (0.71)

Value of Labour-Power II

- So vlp measures
  - (productive labour) wage share of net output (0.25)
  - proportion of total money value added that the (productive) working class receives in exchange for an hour of collective labour-power



- Net output that is not wages is profit, produced by working class but accruing to capitalist class; hence called surplus-value
  - proportion of net value that working class does not receive is due to exploitation

Value of Labour-Power III

$$vlp = w\lambda_m^*, \text{ and since } \lambda_m^* = \frac{H}{py}$$

$$vlp = \frac{wH}{py} = \frac{W}{Y}$$

- Remember earlier assumptions
  - workers do not save
  - conservation of value for all commodities in the wage-bundle
- These strong assumptions are only necessary to get result that

  vlp = value of wage-bundle of commodities

- What happens when we do not make these assumptions?

Value of Labour-Power IV

- Consider the C-M-C circuit of the commodity labour-power
- Assumption of equal or equivalent exchange (and no savings out of wages) means:

$$\text{Commodity law of exchange}: \quad \frac{vlp}{\lambda_m} = w$$

$$\text{Budget constraint}: \quad w = \frac{\mathbf{pb}}{H}$$

$$\text{Generalised equal exchange}: \quad \mathbf{pb} = \frac{\boldsymbol{\lambda}\mathbf{b}}{\lambda_m}$$

- But equal or equivalent exchange for individual commodities does not in general hold, so that
  - the last equality is an inequality
- It cannot be the case that *vlp* is the value of the real wage

Value of Labour-Power V

- Value conservation only applies in aggregate
- So in general

  vlp ≠ value of wage bundle necessary to (re)produce labour power

  - *vlp* = proportion of total money value added that (productive) working class receives in exchange for 1 hour of collective labour-power

- Wage is determined by
  - subsistence floor
  - 'moral and historical element'
    - class struggle over construction and implementation of social norms

- All sorts of short-run fluctuations, but in long run issue is cost of maintaining some socially determined standard of living, as proportion of each hour of labour

The Laws of Exchange

- Begin with the commodity law of exchange (ltv)
- Then add capitalist law of exchange (equalisation of *r*)
- Does the capitalist law of exchange supersede the commodity law of exchange?
  - always and everywhere?
- Answer: no
  - the capitalist law of exchange has no effect on aggregate value added (*H* remains the same) and, by the conservation principle, has no effect on the representation of *H* as a sum of money (value added in price terms)

$$\mathbf{py} = \frac{H}{\lambda_m}$$

  - the capitalist law of exchange has no effect on the sale of labour-power for a wage

$$w = \frac{vlp}{\lambda_m}$$

Implications

- Prices distribute social labour across net output
  - they do differ in that distribution according to whether commodity exchange or capitalist exchange is considered
  - but what matters is only that there *is* a distribution

- Social division of labour allocates portions of social labour to production processes, through decentralized price mechanism
  - qualitatively, prices are always the bearers of social labour
  - quantitatively, total net output, evaluated at whatever prices are, must always = total hours worked at prevailing value of money

Capitalist Laws: A Summary I

- Assume an economy where
  - capitalists as employers allocate social labour
  - labour and capital are perfectly mobile

- Principle of equalization of advantages of production tends to equalise wages, or more generally rates of exploitation (ratios of unpaid to paid labour)
  - labour mobility $\Rightarrow$ Commodity Law of Exchange

- Principle of equalisation of *r* determines natural prices
  - capital mobility $\Rightarrow$ Capitalist Law of Exchange

Capitalist Laws: A Summary II

- Commodity exchange combined with labour mobility entails an exact LTV for each individual exchange

  price = value ÷ value of money

- Adding capitalist exchange combined with capital mobility entails
  - LTV no longer exact for any individual produced commodity
  - LTV remains exact in labour market and for total value added
- This is sufficient to explain
  - existence of exploitation
  - rate of exploitation
  - overall level of profits as unpaid labour
- Individual prices
  - remain qualitatively bearers of social labour
  - quantitatively diverge from labour values (in all commodity markets except the market for labour-power) because capitalist exchange entails systemic unequal or non-equivalent exchange

The Simple Mathematics

Conservation principle:

$$\mathbf{py} = \frac{H}{\lambda_m}$$

Commodity law of exchange applied to labour-power:

$$w = \frac{vlp}{\lambda_m} \quad \Rightarrow \quad wH = \frac{vlp.H}{\lambda_m} \quad \Rightarrow \quad V_{£} = \frac{V_h}{\lambda_m}$$

Net output is wages plus profits:

$$\mathbf{py} = wH + S_{£}$$

$$\Rightarrow \frac{H}{\lambda_m} = \frac{V_h}{\lambda_m} + S_{£} \quad \Rightarrow \quad S_{£} = \frac{H - V_h}{\lambda_m} = \frac{S_h}{\lambda_m}$$

$$e = \frac{S_h}{V_h} = \frac{S_{£}}{V_{£}}$$

Elaboration of Implications

- Non-equivalent or unequal exchange has implications for understanding competitive strategy
  - very large capitalist firms are small relative to
    - world economy
    - pool of world surplus-value
  - each makes negligible contribution to this pool through exploitation of its own workers
  - profitability of any firm rests on its ability to secure share of pool of surplus-value through its competitive strategy
    - extreme cases (land rents, intellectual property royalties, finance etc): appropriators of surplus-value may make no contribution at all to pool of surplus-value through production and direct exploitation of workers

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

Summary: LTV From Smith to Marx

- 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: only for labour power and for total value added
    - in all other markets: unequal exchange of values is necessary
  - precisely how is what 'transformation problem' is about