Marxian Economics 101: the equations

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The letters

c: constant capital, the value of materials and machinery used up. It passes into the product.
v: variable capital, the wages paid for labour-power.
s: surplus value, the new value beyond v.
Labour-power is the capacity to work. Labour is the activity.

Value and cost

$$w = c + v + s$$

$$\text{new value} = v + s$$

$$k = c + v$$

With $c = 100$, $v = 100$, $s = 100$: $w = 300$, new value $= 200$, $k = 200$.

Rate of exploitation

Surplus value for each unit of wages:

$$e = \frac{s}{v} = \frac{100}{100} = 100\%$$

The working day

$$T_n = T \times \frac{v}{v + s}$$

$$T_s = T - T_n$$

$$e = \frac{T_s}{T_n}$$

In an 8-hour day with $v = s$: 4 hours replace the wage, and 4 produce surplus value.

Rate of profit

Surplus value for each unit of capital advanced:

$$r = \frac{s}{c + v} = \frac{100}{200} = 50\%$$

Linking the rates

Replace s with ev, then divide top and bottom by v:

$$r = \frac{ev}{c + v} = \frac{e}{1 + \text{OCC}}$$

$$\text{OCC} = \frac{c}{v}$$

If e stays fixed and OCC rises, r falls. Rising exploitation and cheaper machinery can offset it, so this is a tendency and not a forecast.

Prices of production

Competition tends to equalise profit rates:

$$r = \frac{\sum s_i}{\sum (c_i + v_i)}$$

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

A: $50, 100, 100$. B: $150, 100, 100$. Then $r = 50\%$, $p_A = 225$ and $p_B = 375$. Values are 250 and 350, so 25 is redistributed, and total price equals total value.

Piece wage to time wage

$$w_{\text{hour}} = \frac{\text{pay per piece}}{\text{hours per piece}}$$

PKR 160 per ball at 3 hours per ball gives about PKR 53.33 an hour.

Reading the numbers with care

Money examples assume money is proportional to value, as a teaching convention. Reported profit is only a stand-in for surplus value, so accounts cannot directly measure e.