Conjecture of **?@eq-moneyquant** and **?@eq-workthermal**

How consistently map economic measures to the quantities of nature to model the economical system?

Input:

$$Input = f_0(Resouces, Labor, Capital) = \text{Work} = \Delta\text{Energy} = p \cdot v \tag{1}$$

Output:

$$Output = \text{Goods} + \text{Services} = \text{Production} = \Delta\text{State} = V_I \tag{2}$$

Productivity:

$$Productivity = \frac{Output}{Input} = \frac{\Delta State}{\Delta Energy} = \frac{Production}{Work} = \frac{V_I}{pv} \tag{3}$$

see description of "movement" **?@eq-movement**

Table 1: Core Measurements

Economy	$\rightarrow$		$\leftarrow$	**Physics**
Resources	Assets		Force	Matter
Capital	Liabilities		Momentum	Space
Labor	Expenses		Work	
	Income	Production	Energy	Time

As a first approach, considering the geometrical perspective of the concept of "work" (**?@eq-workgeom**), applied to economical measurements, so to satisfy the following system:

$f_A(Assets) = f_B(Liabilities + Gain) =$ "momentum" p from initial state r_0 to new state r_1, where the change of state is $r = r_1 - r_0$

Matter substance, object movement/change:

$$A = f_A = F \cdot t = p \tag{4}$$

Space of movement, maneuverability:

$$B + R = f_B = m \cdot v = p \tag{5}$$

Work input (efforts, costs) through labor force, machines and infrastructure applied, and materials consumed for production:

$$W = f_0 = F \cdot r = m \cdot \frac{v}{t} \cdot r = p \cdot v \tag{6}$$

Energy transfer, energy change, profit or loss:

$$Y = \Delta E = \frac{1}{2} pv + \mathcal{U} \tag{7}$$

Production value inflation adjusted:

$$P \cdot V_I = \sum Y_{adjust} = \sum (W + R)_{adjust} = \Delta U - \Delta H = Q \cdot N \tag{8}$$

see **?@eq-workthemostat** and **?@eq-workgeom**

Thus, to be determined are v (economy velocity) and p (financial structure). Eventually, determine r = "state change through trajectory" (substance change to the new assets structure) by given v = "velocity of movement" (Business speed = monetary value, price with inflation), or determine v by given r. The individual positions $\{i, j, l, m\}$ of Liabilities $\{B_i + R_j\}_k$, Assets $\{A_m\}_k$, and Expenses $\{W_l\}_k$ shall be grouped in sets $\{k\}$, so to satisfy $f_k(i, j) = f_k(m) = f_k(l) = \{pv\}_k$.

The constraints shall be modelled with the Lagrangian. Hence, "Work" shall be derived from the Hamiltonian which leads to the identification of the "movement" (= change, transformation) of the trajectory (= path to new state) with $\dot{r} = v$ and $\dot{p} = F$.

Experiment design: p **and** v **are modelled ex-ante with means of CONSTRAINTS from contractual agreement and from given juristic legislation, in such a way that physics laws are satisfied. Decisions making occure within this ex-ante frame.**