

**Towards a sustainable society:
Concept for an alternative
economic system**

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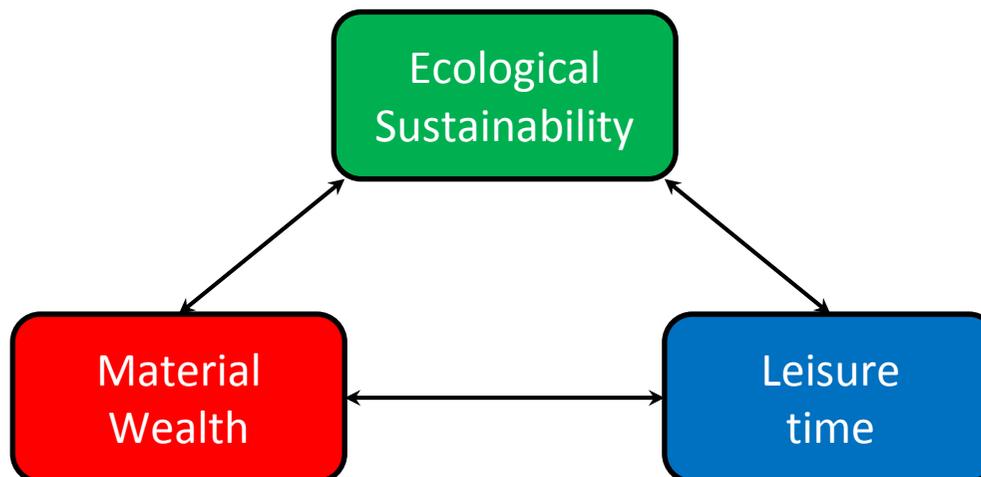
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1 Introduction

- The present capitalistic economic system has changed and changes the state of the world in such a way that planetary limits are reached soon.
- The capitalistic economy stimulates wasteful consumption in industrial nations for which humans of the lower class must work hard and often under degrading conditions.
- The social inequality is increasing.
- A fair division of labor, to be realized by a reduction of the working time is systematically prevented to maintain competition and keep productivity high.
- Solving these problems requires a new economic system built on different principles.

Objectives of economy



- Ecological sustainability, material wealth and leisure time are positive things but they are to some degree contradicting.
- The priority should shift to ecological sustainability and technological progress should aim at a mitigation of the contradictions with sustainability.

Capitalist economy:

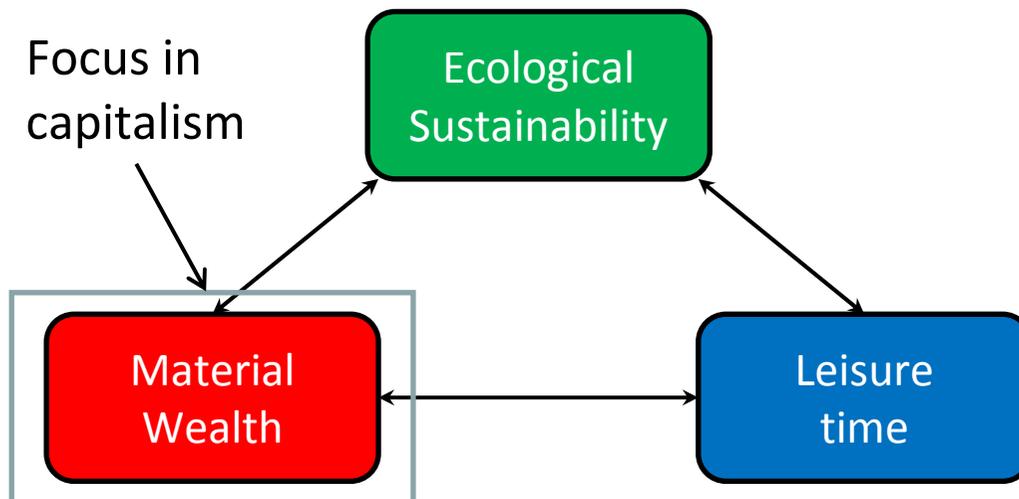
Accumulation of capital and technological progress lead to economic growth.

The possible advantage of more leisure time due to technological progress is not availed.



Bundesarchiv, B 145 Bild-F039789-0014
Foto: Schaack, Lohar | 22. Januar 1973

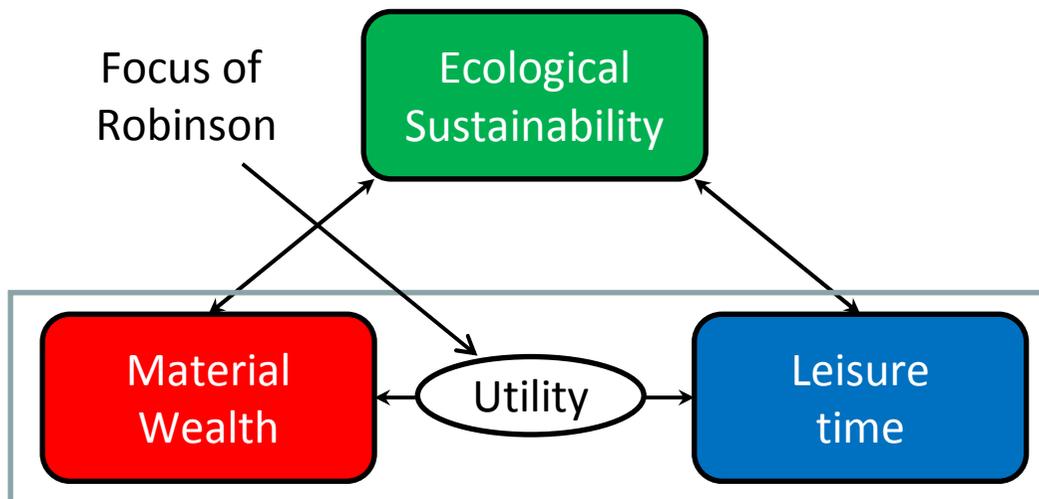
Technological progress



Robinson Crusoe economy:

In this economy the steady state naturally results from utility maximization of a *homo economicus*.

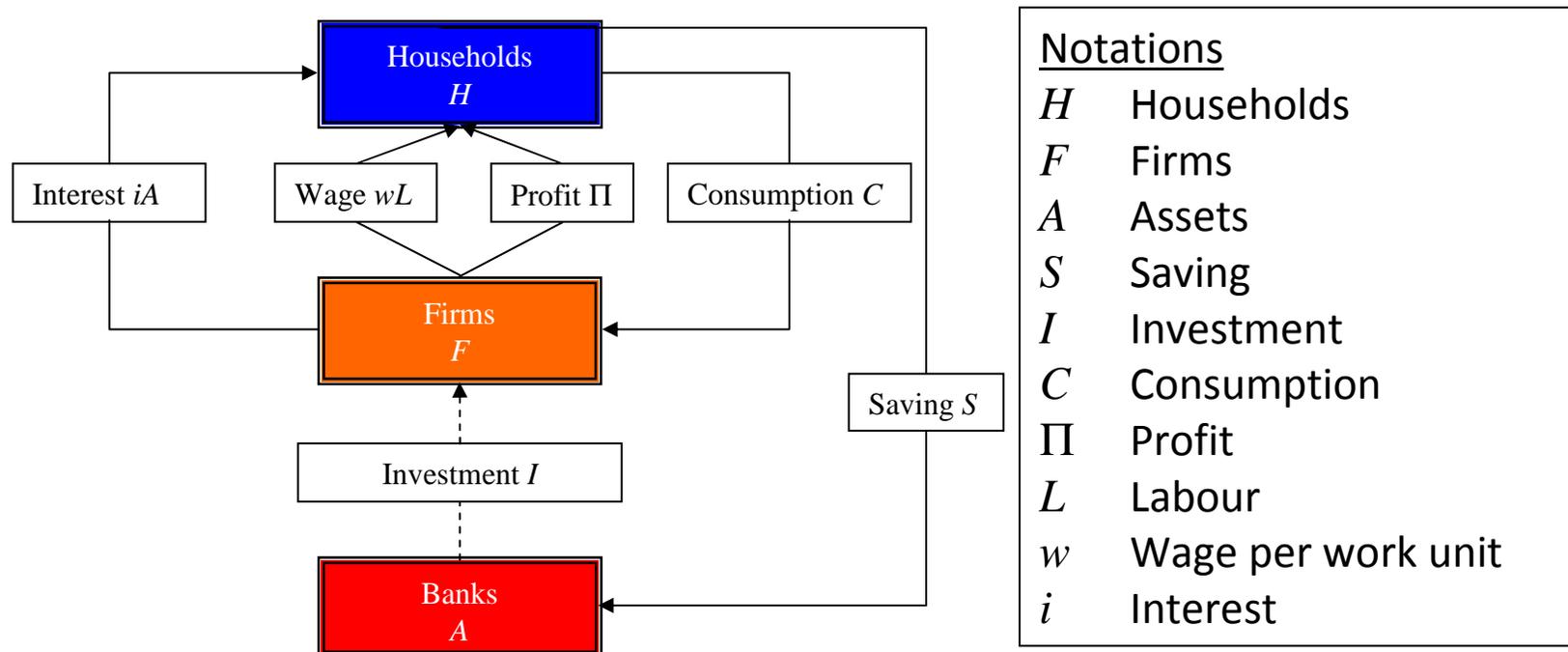
It makes no sense for Robinson to accumulate, e.g. producing many spare axes and spare umbrellas.



2 Macroeconomics of the current economy

The fundamental difficulties already becomes evident in the neoclassical macroeconomic model. It divides the complete economic system into one aggregate for households, one for firms and one for banks (e.g. Felderer and Homburg 2005).

Sketch of the monetary circuit



The monetary circuit of this macroeconomic model can be summarized by three equations:

$$I \quad \frac{dH}{dt} = iA + wL + \Pi - C - S$$

$$II \quad \frac{dF}{dt} = -iA - wL - \Pi + C + I \quad \Rightarrow \quad \frac{d}{dt}(H + F + A) = I \neq 0 !$$

$$III \quad \frac{dA}{dt} = S$$

- The money supply is not conserved!
- Saving S must decline to zero for a steady-state. However, this appears illusory as households with large incomes cannot spend their money solely on consumption.
- Therefore, such an economy does not appear sustainable in the long run.

Relation to the real economy

- The production is described in terms of a neoclassic production function, e.g. the Cobb-Douglas-function

$$Y = Y(K, L) = c_Y K^\alpha L^{1-\alpha}$$

α ($0 < \alpha < 1$) and c_Y are constants (the latter increases with technological progress).

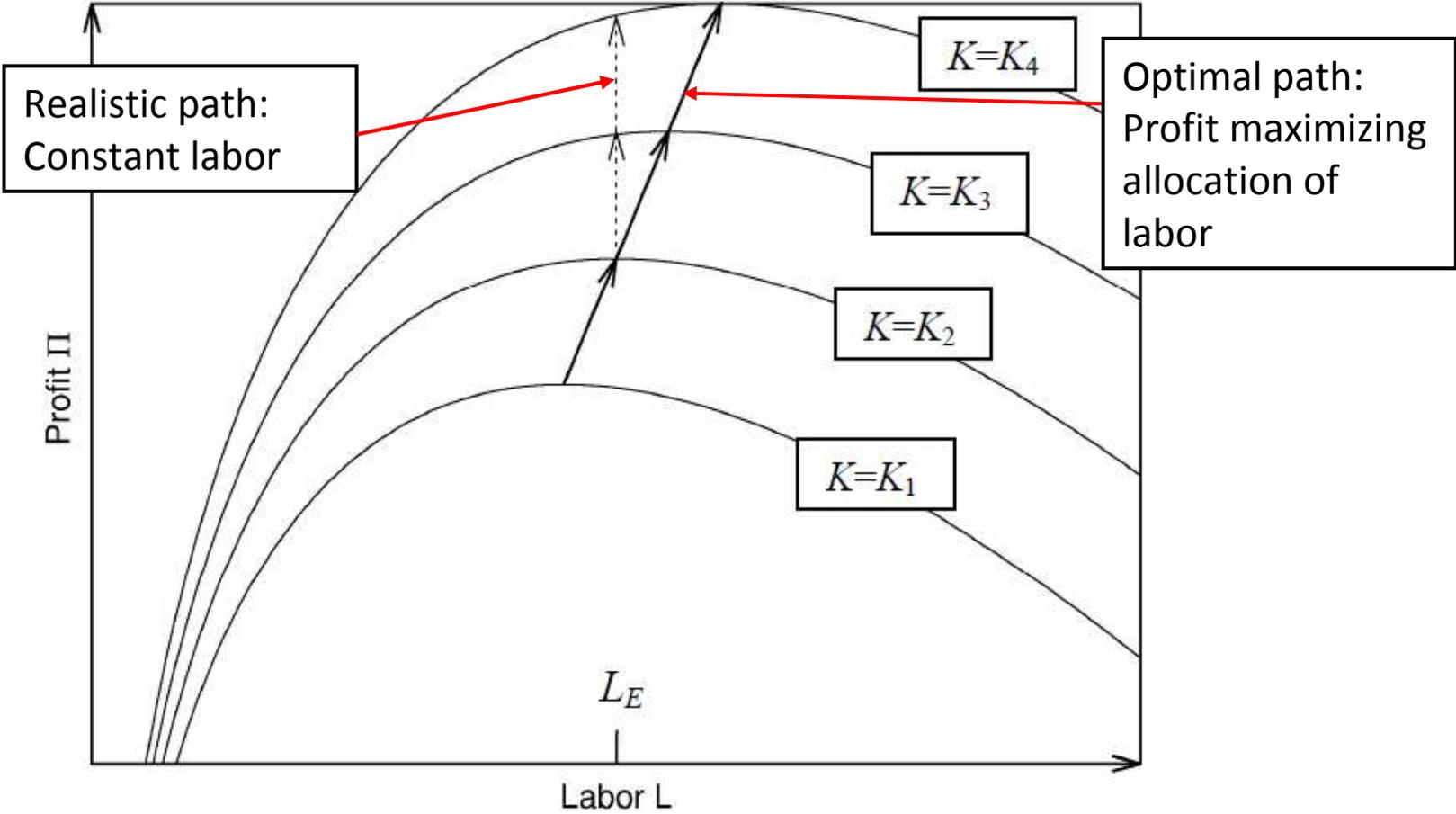
- The real profit Π results from the equation

$$\Pi = Y - \frac{w}{P} L - \frac{i}{P} A$$

in which P denotes the price.

- The amount of labor L can be deduced by maximizing Π .

Profit as a function of Labor L for various amounts of capital K



Economic growth (Solow-Swan model)

- The production creates capital, consumer goods and restore existing capital . Therefore (assuming $P=1$ for simplicity),

$$Y = \frac{dK}{dt} + C + \delta K = \frac{dK}{dt} + (1-s)Y + \delta K$$

where δ denotes the depreciation and s the saving ratio.

- A steady state is inevitable when labor remains limited. In this state we have

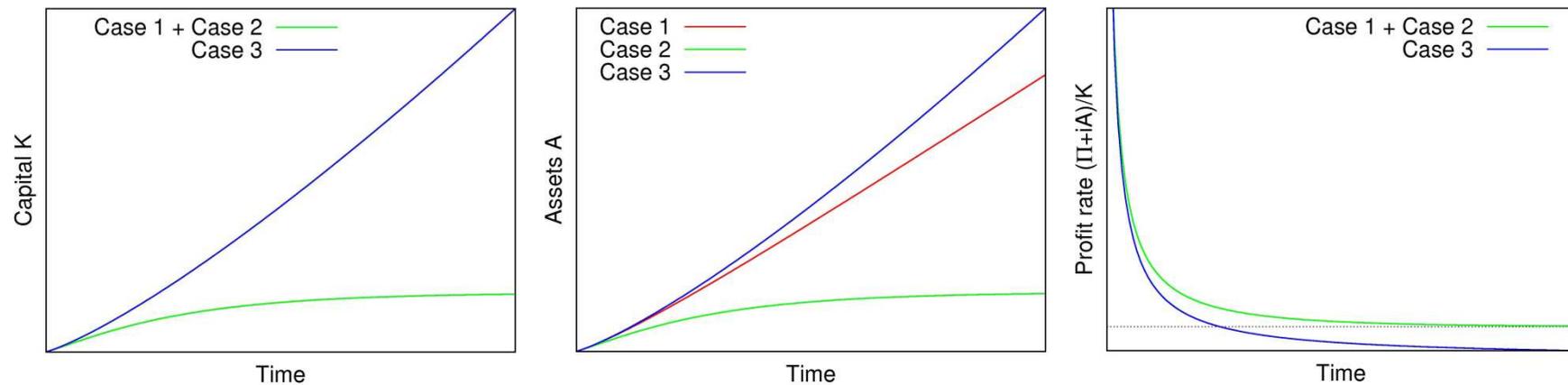
$$sY = \delta K$$

- Problem: the real economy reaches a steady state while the monetary economy can not!

The economic development depends upon the investment policy

	Case 1	Case 2	Case 3 (questionable)
Investments	Capital + Depreciation	Capital + Depreciation	Capital only
Depreciation costs	Employer	Investor	Employer

Time developments for capital K , assets A and profit rate $(\Pi+iA)/K$



Summary

- All 3 cases reveal a fall of the profit rate making a crisis likely.
- In case 2 a steady state also results for monetary assets. However, the return on capital approaches zero. This has the consequence that saved money will be increasingly extracted from the monetary circuit due to the liquidity premium (see e.g. Loehr 2012).
- The only ways to overcome crisis is destruction of capital or technological progress! But this is not a sustainable solution.
- The problems are even more dramatic when the planetary boundaries are taken into account.

3 Principles of an alternative economic system

Aims

- Stop the unearned accumulation of property by a minority
- Suppress the increasing exploitation of natural resources
- Decrease the average consumption in industrial nations
- Establishment of humane living conditions for all people in this world

The alternative economic system is divided into

- National level (national states with a high degree of economic autonomy)
- Global level (superordinate global government to fairly regulate natural resource allocation)

Principles at the national level (selection)

- Residential property owned by inhabitants only. Other immovables should be owned by the national state and can be allocated to firms.
- Banks are replaced by a democratically authorized state agency.
- Prevention of money hoarding by a tax on monetary assets
- Firm holders must distribute a part of their profit to their staff.
- Limitation of production. This necessitates a limitation of the average working time for a fair distribution of labor.
- Import and export have to be restricted to goods and raw material that cannot be produced and mined in the respective countries.
- Introduction of a resource and pollution tax serves to trigger technological progress in the use of renewable resources.

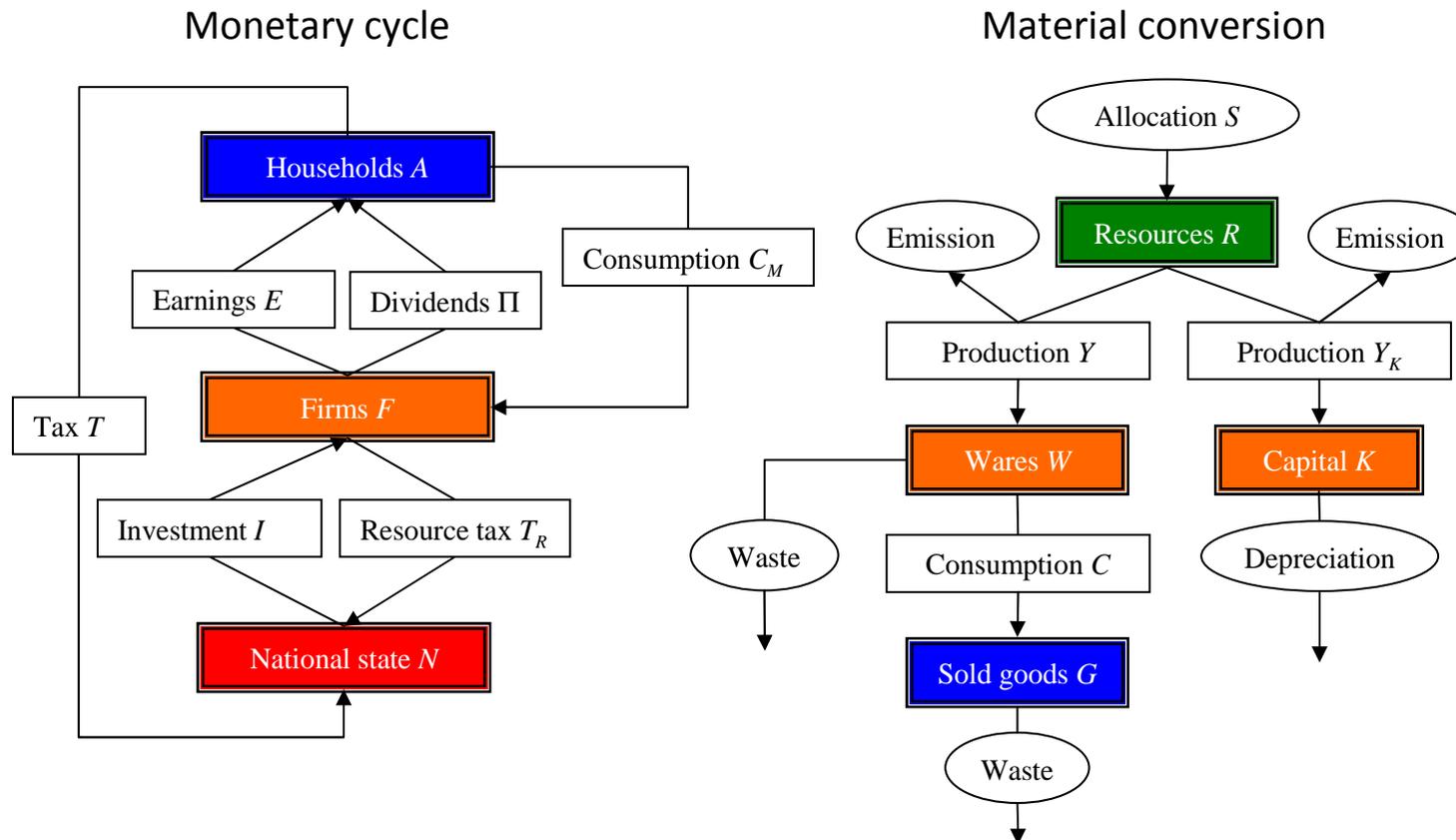
Principles at the global level

- The exchange of natural resources that are not available in every country is regulated by a global government of the global community.
- An independent sustainability council decides together with the global government about the extent of non-renewable resource mining.
- A global currency has to be introduced for an equitable distribution of natural resources and the associated amount of labor.
- Countries with few natural resources must compensate the lower amount of labor by additional production of useful goods.
- Nature protection and implementation of human rights also fall under the responsibility of the global government.

4 Macroeconomics of the alternative system

The macroeconomics at the national level is explained with a mathematical model.

Schematic of the model



Specifications

- The total money supply is constant
- Monetary assets are taxed by the government to control the amount of money in the circuit
- Investments are regulated by the government
- A resource and pollution tax directs technological progress in the direction of a cleaner and resource-saving production
- A fixed minimum wage is introduced.
- The economy must cope with the exogeneously given resource allocation.

Model equations

Private assets:
$$\dot{A} = -(1-r_p)[C - (L + L_{KE}) - c_R P(\sqrt{LK} + c_{YK}\sqrt{L_K K})(1 + f_P c_D K)] - c_T(A - A_E) + L_K - L_{KE}$$

Firm assets:
$$\dot{F} = (1-r_p) [C - (L + L_{KE}) - c_R P(\sqrt{LK} + c_{YK}\sqrt{L_K K})(1 + f_P c_D K)]$$

Government assets:
$$\dot{N} = c_T(A - A_E) - L_K + L_{KE}$$

Natural resources:
$$\dot{R} = S - (\sqrt{LK} + c_{YK}\sqrt{L_K K})(1 + c_D K)$$

Wares:
$$\dot{W} = \sqrt{LK} - c_p (1 - G) \frac{A}{P} - W$$

Private goods:
$$\dot{G} = c_p (1 - G) \frac{A}{P} - G$$

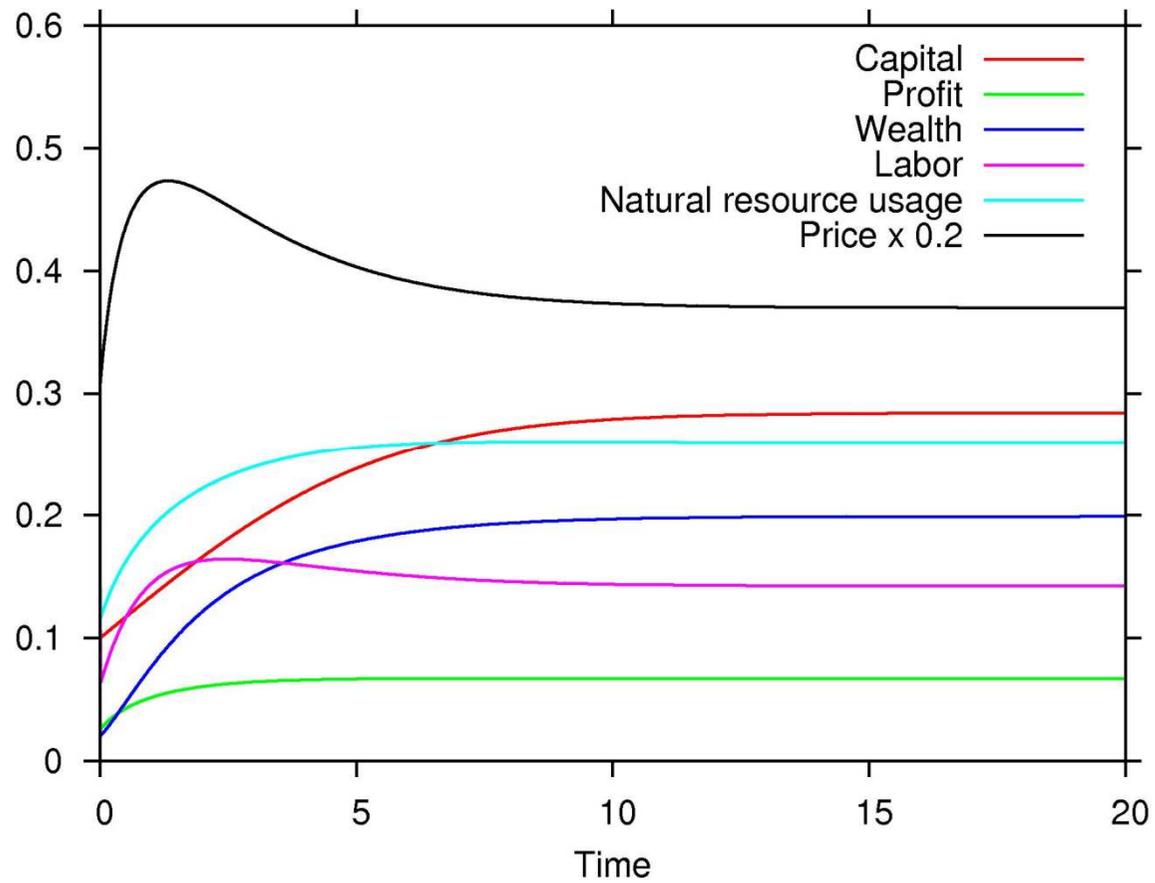
Real capital:
$$\dot{K} = c_{YK}\sqrt{L_K K} - \frac{K}{\tau_K}$$

Assumptions

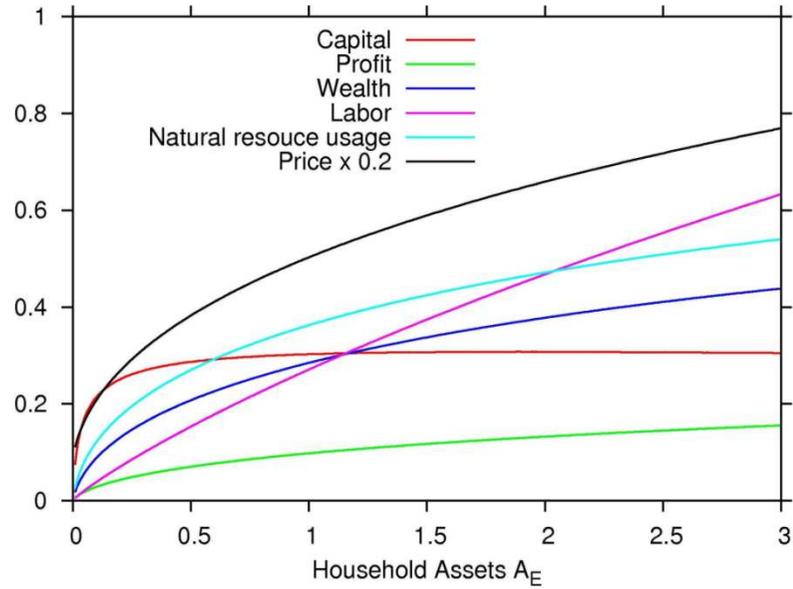
- The price adjusts immediately to the demand so that overproduction cannot take place.
- The consumption is a function of monetary assets and saturates at a prescribed material wealth (income dependent consumption is treated in another more complicated model)
- The firms maximize profit by employing their capital most efficiently.
- The firms do not accumulate monetary assets.
- Investments into the economy take place until the profit maximizes.

The model has a stable equilibrium:

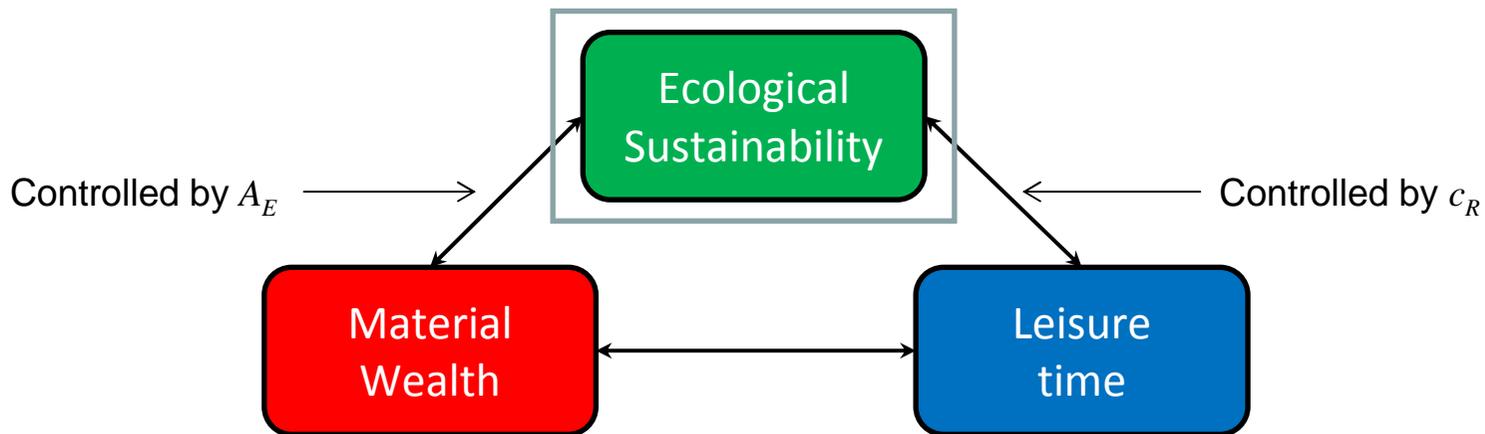
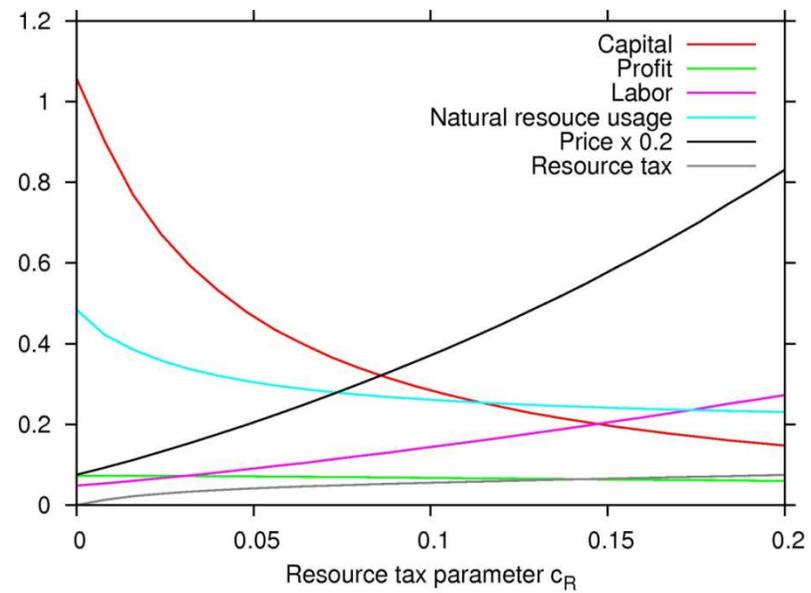
A steady-state economy develops after the economic growth stage.



Equilibrium characteristics as a function of household assets



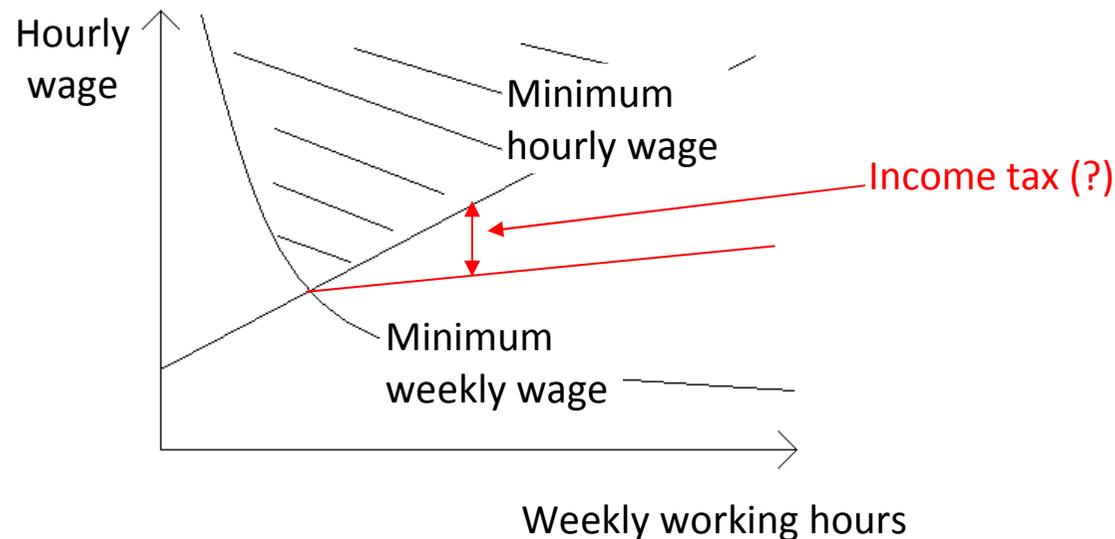
Equilibrium characteristics as a function of resource tax for at a prescribed wealth



5 Wage and redistribution tax

a) Wage

- The working time per capita should be adjusted to avoid mass unemployment
- Two minimum wages (sectoral) have to be introduced:
 - Minimum weekly wage (sufficient for a below average life style)
 - Minimum hourly wage rate (increase with weakly working hours)



b) Redistribution tax

- The macroeconomic model does not tell us anything about the inequality.
- A redistribution tax on monetary assets can lessen any inequality.
- Parts of this tax could be used for the payment of a basic income.
- It should be so large that the gap between rich and poor is much smaller than nowadays but not too large in order to sustain the motivation for the supply of useful performance.
- Such a redistribution system is essentially an implementation of the „free money“ idea by Silvio Gesell.

6 Conclusions

- The proposed alternative economic system could be a conceivable solution towards a fair and sustainable society.
- It can lead to growth in developing countries and degrowth in industrial nations.
- Together with the fair sharing of natural resources a gradual reduction of inequality between north and south becomes possible.
- The national economy becomes more solidary as powerful society members support the less powerful ones by a redistribution tax and no one can get richer solely due to their private property.
- Unemployment is minimized by a working-time dependent wage rate. This could lead to more leisure time, especially in industrial nations.

**Thank you
for your attention!**

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