Quality over Quantity

A stock-flow consistent analysis of socio-economic impacts in consumption pattern transitions

ISEE 2025 - RS 4.1.1: Social-ecological provisioning systems

Kilian Rouge, Franck Lecocq, Julien Lefèvre

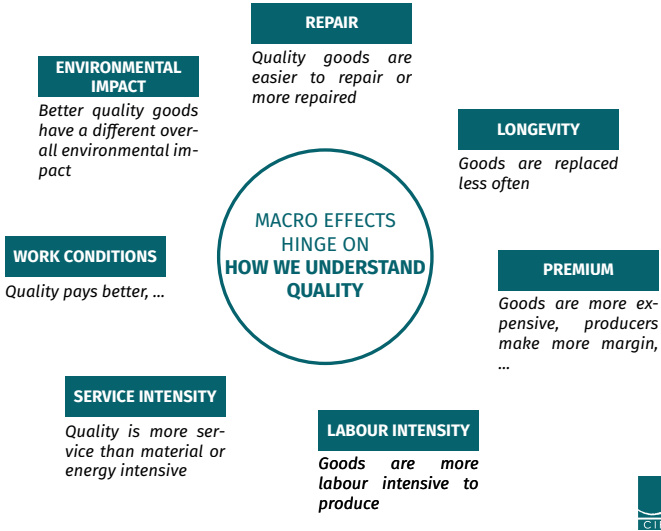
Centre International de Recherche en Environnement et Développement (CIRED)
Paris, France

June 25. 2025

Context

Research question

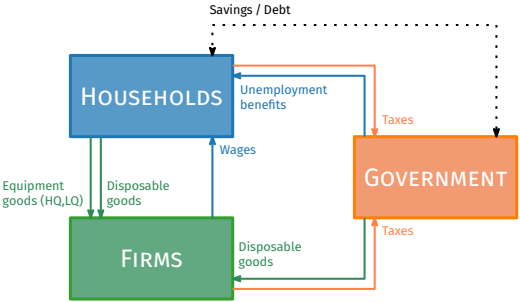
To what extent can promoting quality-oriented consumption foster sufficiency and what socio-economic changes might emerge during this transition?



Extra short literature review

- *Quantity* $\rightarrow$ *Quality* transition literature mainly focuses on the microeconomics of the production side (Cooper, 2016; Niessen & Bocken, 2021)
- Monserand (2022) investigates the impact of planned obsolescence on inequalities in an SFC model
- Aghion et al. (2025) analyses a *quantity* $\rightarrow$ *quality* transition in an orthodox growth model where quality is service intensity

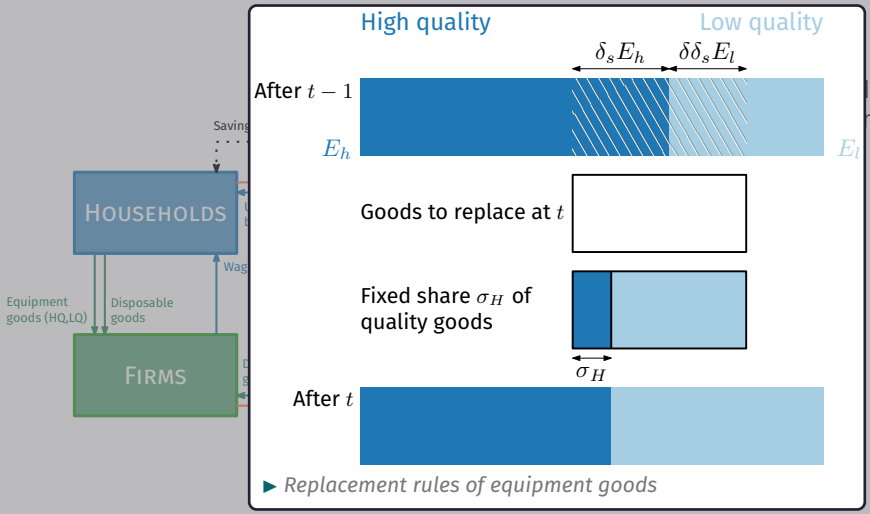
Presentation of the model



Key assumptions

- Households replace depreciated equipment $\delta_E = \delta_s E_h + \delta_s \delta E_l$ by an exogenous share σ_h of high-quality goods

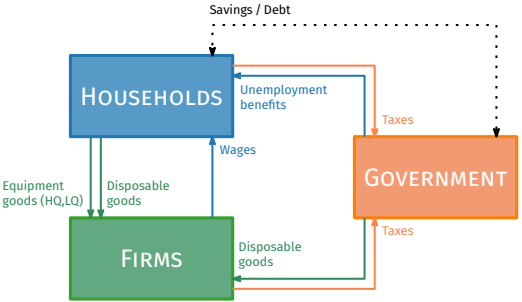
Presentation of the model



epreciated equipment
n exogenous share σ_h of

▶ *Replacement rules of equipment goods*

Presentation of the model



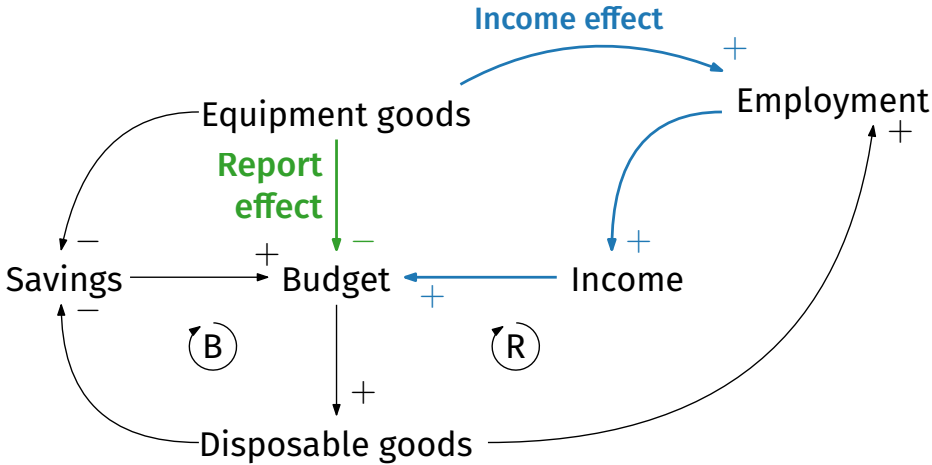
Key assumptions

- Households replace depreciated equipment $\delta_E = \delta_s E_h + \delta_s \delta E_l$ by an exogenous share σ_h of high-quality goods
- Budget composed of parts of residual income and savings is allocated to disposable goods : $B(t) = \alpha_{YD}(YD_t - C_{e_t}) + \alpha_H H_{t-1}$
- Prices, labour intensity, wages and government expenses are exogenous
- Depreciation is exogenous. Thus the transition to higher quality goods always entails the same direct sufficiency effect
- Workforce is constituted to match demand

Scenarios

Differentiation	Longevity $\delta > 1$	Labour intensity $A_h > A_l$	Wages $W_h > W_l$	Working hours $h_h < h_l$	Mark-up $\phi_h > \phi_l$
Baseline	✓				
Scenario 1	✓	✓			
Scenario 2	✓		✓		
Scenario 3	✓			✓	
Scenario 4	✓				✓

Transmission channels



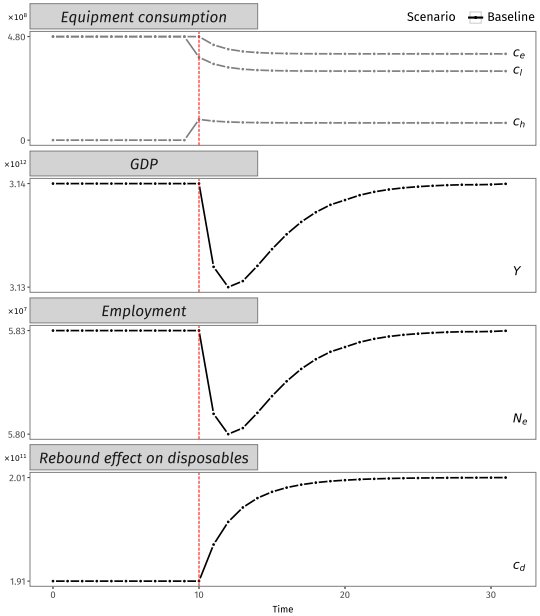
▶ *Causal loop diagram of key dynamics following a change in longevity of goods - Baseline*

Baseline - Longevity

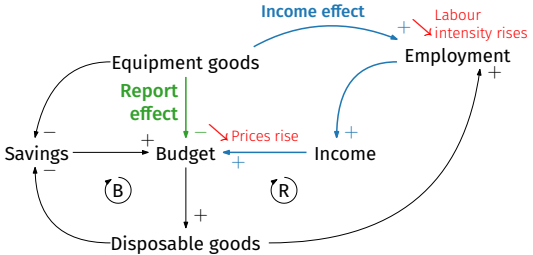
Shock on σ_H at $t = 10$

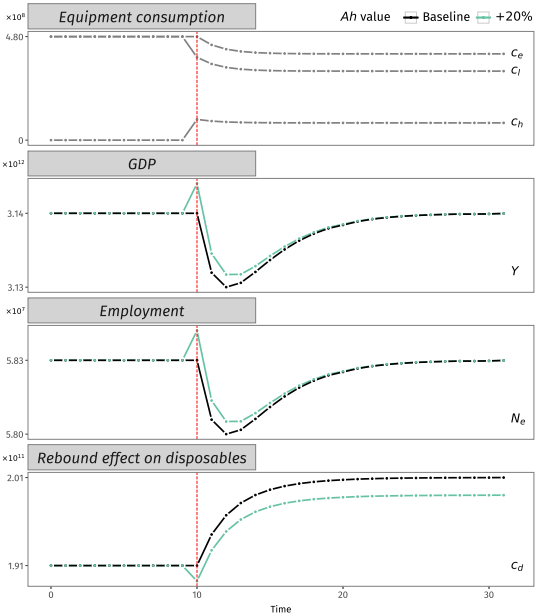
Key results

- Equipment good consumption decreases
- Employment decreases short-term
- Public balance equilibrates at initial state through savings balancing loop
- The decrease in equipment consumption is offset by a rebound effect in disposable consumption



S1 - Labour intensity

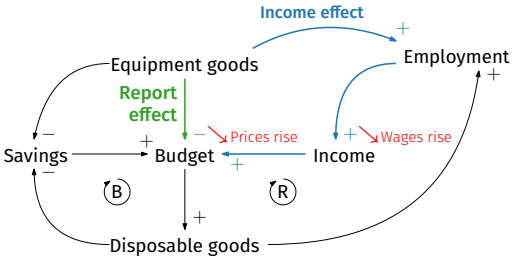


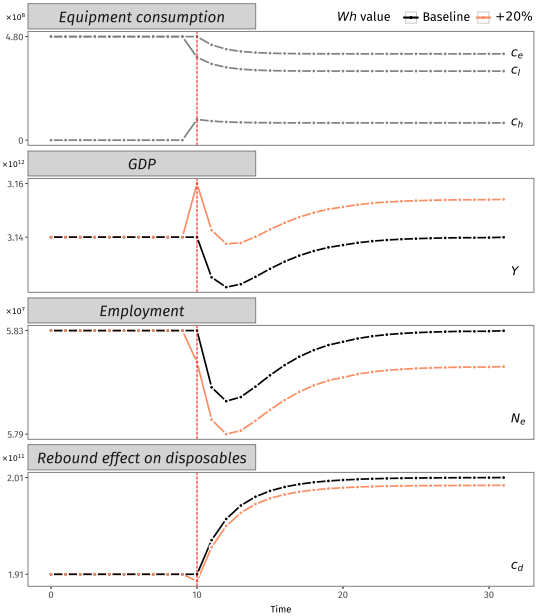


Key results

- Rebound effect decreases
- Short-term employment increase

S2 - Wages





Key results

- Income increases
- Rebound effect decreases
- Thus employment decreases

Key results

- *Comparison of key variables to baseline*

Differentiation *Scenario*	**Labour intensity** S1	**Wages** S2	**Working hours** S3	**Mark-up** S4
Rebound effect	▼	▼	▼	►
Short-term employment	▲	▼	▲	►
Long-term employment	►	▼	▲	►
GDP	►	▲	▼	▲

The size of the rebound effect is smaller when quality additionally implies higher wages or labour intensity

Key results

- *Comparison of key variables to baseline*

Differentiation *Scenario*	**Labour intensity** S1	**Wages** S2	**Working hours** S3	**Mark-up** S4
Rebound effect	▼	▼	▼	►
Short-term employment	▲	▼	▲	►
Long-term employment	►	▼	▲	►
GDP	►	▲	▼	▲

Long-term employment dynamics are only impacted when quality goods differ in wages, profit or hours worked

Key results

- *Comparison of key variables to baseline*

Differentiation *Scenario*	**Labour intensity** S1	**Wages** S2	**Working hours** S3	**Mark-up** S4
Rebound effect	▼	▼	▼	►
Short-term employment	▲	▼	▲	►
Long-term employment	►	▼	▲	►
GDP	►	▲	▼	▲

High differences between wages in high and low quality exacerbate inequalities: more gross product is split among fewer people.

Next steps

Model evolutions

- Add heterogeneity (employment, qualifications, profit repartition)
- Add structural change (labour market, labour productivity, investment)
- Endogenise quality switch

Policy implications

1. What policies to foster the quality transition ?
2. What policies to mitigate potential adverse effects ?

considering

- Sector-specific representation of quality
- Comprise between environmental and socio-economic effectiveness

Appendix

References

Aghion, P., … Zilibotti, F. (2025).A theory of endogenous degrowth and environmental sustainability.

Cooper, T. (Ed.). (2016). *Longer lasting products: Alternatives to the throwaway society*. Routledge.

Monserand, A. (2022).Buying into inequality: A macroeconomic analysis linking accelerated obsolescence, interpersonal inequality, and potential for degrowth. *European Journal of Economics and Economic Policies Intervention*, *19*(1), 119–137.

Niessen, L., & Bocken, N. M. (2021).How can businesses drive sufficiency? The business for sufficiency framework. *Sustainable Production and Consumption*, *28*, 1090–1103.

QUALITY104

Balance sheet and transaction-flow matrix

Assets/Liabilities	Households	Production	Government	Σ
High-quality goods (E_h)	$+E_h$			$+E_h$
Low-quality goods (E_l)	$+E_l$			$+E_l$
Money (H)	$+H_h$		$-H_g$	o

Transactions	Households	Production	Government	Σ
Consumption high-quality	$-C_h$	$+C_h$		o
Consumption low-quality	$-C_l$	$+C_l$		o
Consumption of disposable goods	$-C_d$	$+C_d$		o
Government spending		$+G$	$-G$	o
Wages	$+WB$	$-WB$		o
Unemployment benefits	$+U$		$-U$	o
Profits	$+P$	$-P$		o
Taxes	$-\theta_{WC}WB$	$-\theta_{EC}WB$	$+CO$	o
ΔH	$+\Delta H_h$	o	$-\Delta H_g$	o

Key equations

Consumption

- $\delta_E = \delta_s \cdot E_h(-1) + \delta_s \cdot \delta \cdot E_l(-1)$
- $c_l = (1 - \sigma_h) \cdot \delta_E$
- $c_h = \sigma_h \cdot \delta_E$
- $C_d = \alpha_{YD} \cdot (YD - C_e) + \alpha_H \cdot H_h(-1)$

Employment

- $N^{(e)} = \frac{A_h c_h}{h_h} + \frac{A_l c_l}{h_l} + \frac{A_d(c_d + g)}{h_d}$

QUALITY104 **EQUATIONS**

(1) $UC_l = A_l \cdot W_l$

(2) $UC_h = A_h \cdot W_h$

(3) $UC_d = A_d \cdot W_d$

(4) $p_h = (1 + \phi_h) \cdot UC_h$

(5) $p_l = (1 + \phi_l) \cdot UC_l$

(6) $p_d = (1 + \phi_d) \cdot UC_d$

(7) $c_l = (1 - \sigma_h) \cdot \delta_E$

(8) $c_h = \sigma_h \cdot \delta_E$

(9) $c_e = c_l + c_h$

(10) $c_d = \dfrac{B}{p_d}$

(11) $\delta_E = \delta_S \cdot E_h(-1) + \delta_S \cdot \delta \cdot E_l(-1)$

(12) $N^{(e)} = \dfrac{A_h c_h}{h_h} + \dfrac{A_l c_l}{h_l} + \dfrac{A_d(c_d + g)}{h_d}$

(13) $N^{(u)} = N - N^{(e)}$

(14) $\nu = \dfrac{N^{(u)}}{N}$

(15) $WB = W_h \cdot c_h \cdot A_h + W_l \cdot c_l \cdot A_l + W_d \cdot (c_d + g) \cdot A_d$

(16) $U = W_d \cdot h_d \cdot \xi \cdot N^{(u)}$

(17) $YD = WB \cdot (1 - \theta_{WC}) + U + P$

(18) $B = \alpha_{YD} \cdot (YD - C_e) + \alpha_H \cdot H_h(-1)$

(19) $C_h = p_h \cdot c_h$

(20) $C_l = p_l \cdot c_l$

(21) $C_e = C_h + C_l$

(22) $C_d = c_d \cdot p_d$

(23) $C = C_e + C_d$

(24) $Y = C_h + C_l + C_d + G$

(25) $g = \dfrac{G}{p_d}$

(26) $CO = (\theta_{WC} + \theta_{EC}) \cdot WB$

(27) $P = Y - WB \cdot (1 + \theta_{EC})$

(28) $H_h = H_h(-1) + YD - C$

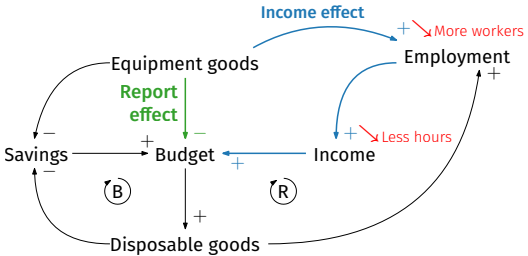
(29) $H_g = H_g(-1) - CO + U + G$

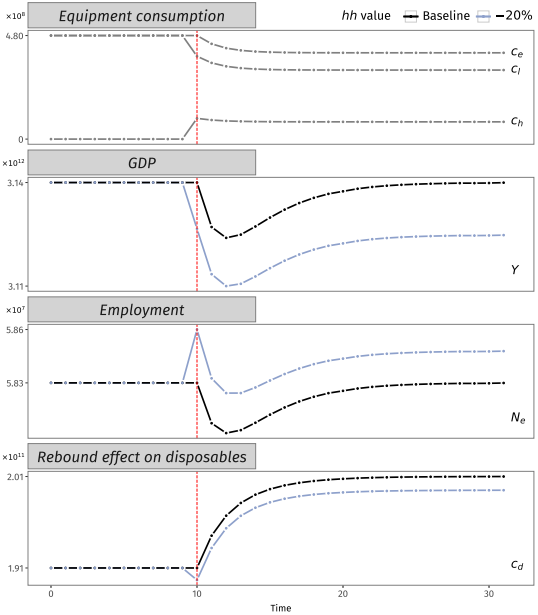
(30) $E_h = (1 - \delta_S) \cdot E_h(-1) + c_h$

(31) $E_l = (1 - \delta_s \cdot \delta) \cdot E_l(-1) + c_l$

(32) $E_t = E_h + E_l$

S3 - Hours worked

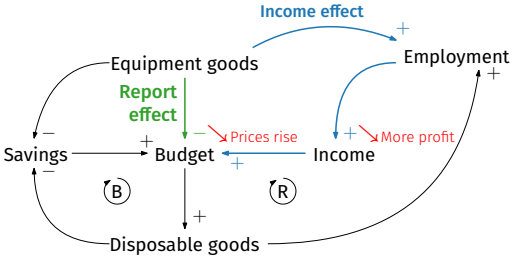




Key results

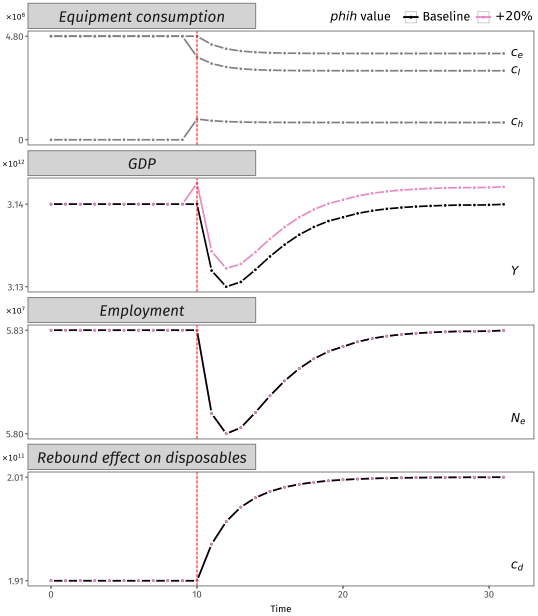
- Rebound effect decreases
- Employment increases

S4 - Profit



Key results

- The increase in prices is offset by the increase in profits redistributed to households



Key results summary

1. The size of the rebound effect is smaller when quality additionally implies higher wages or labour intensity
2. Long-term employment dynamics are only impacted when quality goods differ in wages, profit or hours worked.
3. High differences between wages in high and low quality exacerbate inequalities: more gross product is split among fewer people.

Kilian Rouge, Franck Lecocq, Julien Lefèvre

Oslo, June 25. 2025

CIRED