

Økonomiske modeller og polykrisen

A friendly critique of economy-environment models

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Introduction

Introduction

Models as **political objects**

Inform **decision** and inform **understanding**

Legitimization tools

Contested political field

↳ Souffron and Jacques (2023, p. 1): *"need for and value of incorporating a broader range of complementary modelling tools and models that illuminate aspects often abstracted in conventional approaches"*

Importance of **theoretical and methodological assumptions** and of **underlying political philosophy**

Outline

Four critiques of economy-environment models

A bird eye view at two economy-environment models for Denmark: GreenReform and E-SFCIO

It matters where we transit from: green monetary and fiscal policies as if we were living in finance-led globalized capitalism

Four critiques of economy-environment models

Four critiques

1. IAM typically lack a financial sector
2. Reduce ecological transition to an issue of investment and redirecting monetary flows
3. Ignore socio-technical and ecological issues from "green" investments and the transition itself
4. Lack historical and institutionalist foundations

(Aglietta and Espagne 2023; Espagne 2018)

Lack of financial sector

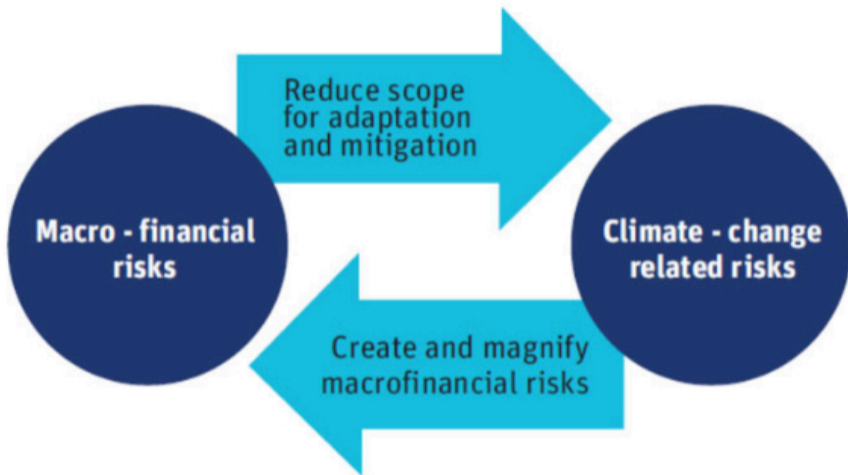


Figure 1: Links between macro-financial risks and climate risks. Source: Feyen et al. (2020, p. 2).

Ecological transition cannot be reduced to a series of investments

"Green" **not** a scientific category

"Green" **context-** and **threshold-specific**

"Green" investments **never** universally green

(Ehlers et al. 2021; Magalhães 2021; Oman et al. 2022)

Sociotechnical and ecological issues of the transition itself

Depoliticized approach to the transition

Ignorance of political economy aspects: income and wealth distribution, distribution of power

Ignore environmental burden shifting

(Aglietta and Espagne 2023; Wood Hansen and van den Bergh 2024)

Lack of historical and institutionalist foundations

Models tend to be **anhistorical**

Estimation/calibration of parameters **insufficient to reflect historical context**

Unclear how key characteristics of **growth regime** are represented

(Aglietta and Espagne 2023)

A bird eye view at two economy-environment models for Denmark: GreenReform and E-SFCIO

Theoretical and methodological characteristics

	E-SFCIO	GreenReform
Theory	post-Keynesian	Neoclassical
Model class	Ecological SFC + IO	CGE linked to sub-modules: energy system, agriculture, lulucf, waste, carbon leakage, transport, abatement
Expectations	Adaptative	Rational expectations with some myopic households
Parameters	Estimated (1995-2019)	Calibrated
Institutional sectors	Households (E-SFCIO: 1 household ; GR: 2 households)	
	Non-financial corporations	
	Financial corporations	
	Government	
	Rest of the world	
Industries	9	52
Goods and services	7 (incl. 6 food products)	81
Energy types	21	
Energy taxes		6
Pollutants	6 GHG	14 GHG and pollutants

Table 1: Comparison of E-SFCIO and GreenReform. Source: based on Kirk et al. (2024) and Thomsen et al. (2024).

Carbon tax on agricultural emissions

Outcome of carbon tax	E-SFCIO	GreenReform
Carbon tax shock	350 dkk/ton of non-energy CO ₂ e emissions but in 2010 (start of simulation), results by 2020 (end of simulation)	747 dkk/t of non-energy CO ₂ e emissions + subsidy for afforestation + tax on emissions from peatlands + subsidies from wetland restoration
GDP	↓ in GDP but unquantified	-0.22% by 2030; - 0.17% in 2040
Employment	↓ in GDP + constant productivity = ↑ unemployment but unquantified	-0.2% in short-run; ↑s in 2030; returns to equilibrium level in the long-run
Trade balance	↓ in agriculture and food exports and ↑ in agri + food imports = -5.5% in real net export	↓ exports > ↓ imports
Price level	Agricultural price-inflation pass-through; about +0.5% for final consumer prices	↑ in most agricultural and food industries prices. Average ↑: 3,8%; median ↑: 1,6%
Financial net wealth	Loss in real financial wealth of all domestic sectors and ↑ in financial wealth of RoW	
Investment		Decrease
Consumption	↓ in consumption and substitution between food products; about -0.7% ↓	-0.12% in 2030
Public finance	Net loss in fiscal revenues [+ ↑ in social benefits due to ↑ in unemployment?]	
Emissions	-1.5% in aggregate emissions by 2020. -9% in agri and food industries	↓ in nearly all agriculture and food industries. Average ↓: -11,3% ; median ↓: - 10,6%

Table 2: Comparison of results of a carbon tax shock in E-SFCIO and GreenReform. Source: based on Kirk et al. (2024) and Thomsen et al. (2024).

It matters where we transit from: green monetary and fiscal policies as if we were living in finance-led globalized capitalism

In the works at RUC

Joint effort with Steven Knauss (associate prof., Technical University of Compiègne, France).

Part of the project *Disruptive Money – Transition risks management in monetary policy and financial regulation and growth regime stability: Assessing disruptive socioeconomic effects of a climate- and sustainability aligned monetary regime*

Funded by the Austrian Central Bank's Anniversary Fund (Österreichische Nationalbank Jubiläumsfonds), project n° 18651

Aiming at explicit historical and institutionalist foundations

Growth regime reflected in parameters values

Beware of parameters estimation period \Rightarrow structural breaks

Huber (2013, p. 177): "*Method of periodization should not be seen as parceling out homogeneous temporal units, clearly distinguished by "clean ruptures" but, rather, as highlighting certain institutional compromises that achieve relative stability despite continual challenge and contestation*"

Growth regime reflected in functional forms (e.g., wage determination, distribution conflicts, expectations)

A model of the transition from finance-led globalized capitalism

Production

Upstream/midstream/downstream firms
Price competition pass-through
Financial norm/shareholder value orientation
Distinction between « green » and environmentally harmful firms

Households and social classes

Upstream/midstream/downstream “green” workers + capitalists
Upstream/midstream/downstream environmentally harmful workers + capitalists
(Government workers)
Unemployed

Money and finance

Banks

↳ Credit rationing

Central bank

↳ Green monetary regime policies

Financial assets

↳ Equity

↳ Loans

↳ Bonds: green, standard

A model of the transition from finance-led globalized capitalism

Government

Environmental policies

Fiscal policy

↳ Material stocks and flows influence climate outcomes

↳ Climate feedbacks on ecosystems

Environmental feedback effects on the economy

Environment

Ecosystem module

Climate module


Ecological interdependencies

If open economy

Ecologically unequal exchange

Balance of payment constraint on growth



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