

A pluralist review of economic theories of the firm – implications for “economic sustainability”

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Sustainability science and economics

What are the roots of sustainability?

- The “growth debate” of the 1970s
- The “economic pillar” is born (Brundtland report)
- *Green and inclusive* growth as new policy goal
- *A-growth, growth independence, post-growth and degrowth* as alternative paradigms

Global Sustainability
cambridge.org/sus

Review Article

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Keywords:

Sustainability scientists' critique of neoclassical economics

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Abstract

Non-technical summary. Neoclassical economics (NCE) theory and neoliberal economics practice together form one of the principal driving forces of environmental destruction and social injustice. We critically examine ten key hypotheses that form the foundations of NCE, and four other claims. Each fails to satisfy one or more of the basic requirements of scientific practice. These NCE hypotheses are fundamentally flawed in their use of the common meaning of NCE, because NCE is socially constructed and its framework that is compatible with the scientific method. We provide a theoretical framework for sustainability science as providing theoretical hypotheses and four empirical hypotheses that form the foundations of environmental destruction. We provide a theoretical framework for sustainability science as providing theoretical hypotheses and four empirical hypotheses that form the foundations of environmental destruction. We provide a theoretical framework for sustainability science as providing theoretical hypotheses and four empirical hypotheses that form the foundations of environmental destruction.

Sustainability Science (2019) 14:681–695
<https://doi.org/10.1007/s11625-018-0627-5>

ORIGINAL ARTICLE

IR3S
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Three pillars of sustainability: in search of conceptual origins

Ben Purvis¹ · Yong Mao^{1,2} · Darren Robinson^{1,3}

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Abstract

The three-pillar conception of (social, economic and environmental) sustainability, commonly represented by three intersecting circles with overall sustainability at the centre, has become ubiquitous. With a view of identifying the genesis and theoretical foundations of this conception, this paper reviews and discusses relevant historical sustainability literature. From this we find that there is no single point of origin of this three-pillar conception, but rather a gradual emergence from various critiques in the early academic literature of the economic status quo from both social and ecological perspectives on the one hand, and the quest to reconcile economic growth as a solution to social and ecological problems on the part of the United Nations on the other. The popular three circles diagram appears to have been first presented by Barbier (*Environ Conserv* 14:101, doi: 10.1017/s0376892900011449, 1987), albeit purposed towards developing nations with foci which differ from modern interpretations. The conceptualisation of three pillars seems to predate this, however. Nowhere have we found a theoretically rigorous description of the three pillars. This is thought to be in part due to the nature of the sustainability discourse arising from broadly different schools of thought historically. The absence of such a theoretically solid conception frustrates approaches towards a theoretically rigorous operationalisation of 'sustainability'.

Keywords Sustainable development · Conceptual review · Historical origins · Triple bottom line · History of sustainability

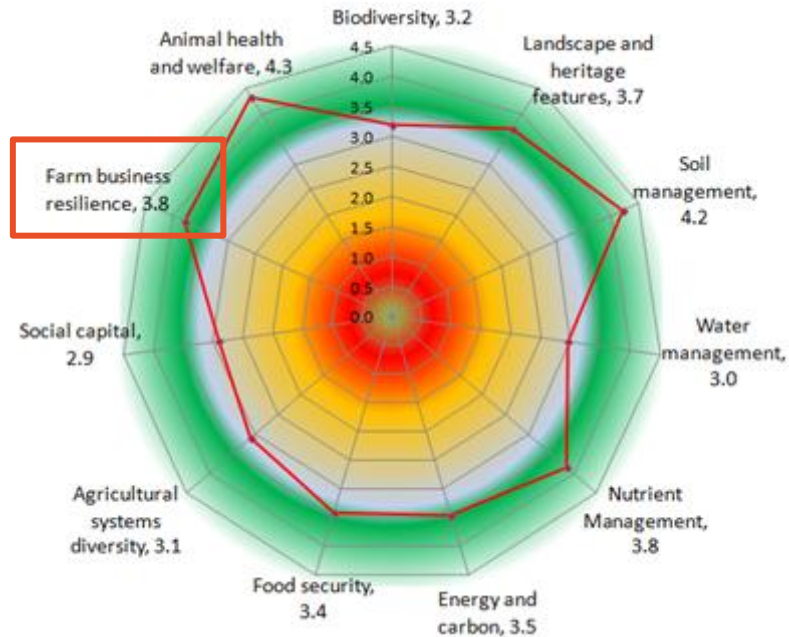
Sustainability science and economics

SAFA Theme	Topic
Investment	Internal improvement
Investment	Community investment
Investment	Long-ranging investment
Vulnerability	Financial stability
Vulnerability	Supply stability
Vulnerability	Production stability
Vulnerability	Market stability
Vulnerability	Liquidity
Resilience	Autonomy
Resilience	Adaptability
Resilience	Diversification
Resilience	Transferability
Resilience	Risk mitigation
Productivity	Land productivity
Productivity	Labour productivity
Productivity	Capital productivity
Profitability	Revenues
Profitability	Costs
Profitability	Profits
Profitability	Efficiency (allocative, technical, financial)
Product quality and information	Food safety
Product quality and information	Product quality
Product quality and information	Product information
Local economy	Local procurement
Local economy	Business cooperation
Local economy	Local sales (short food supply chains)
Local economy	Value creation

What is “economic sustainability”?

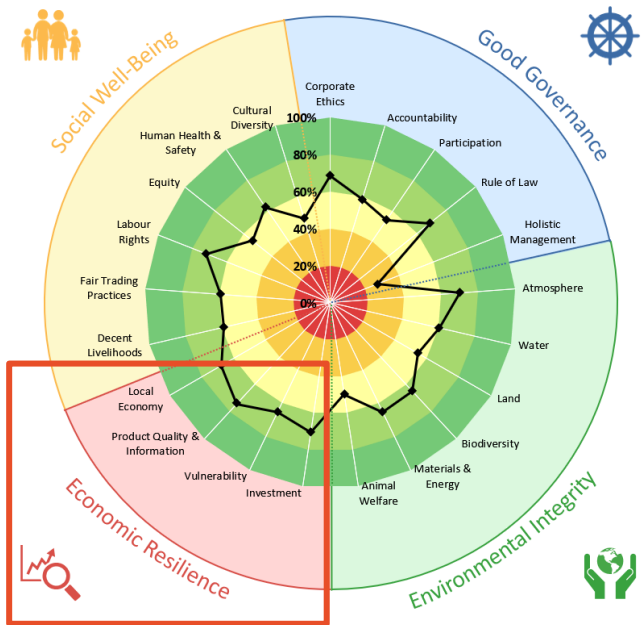
- What is the economy for?
 - Full employment?
 - Price stability?
 - Efficient allocation?
 - Rising income/welfare?
 - Social provisioning?
 - Human flourishing or wellbeing?
 - Justice and equality?
 - A happy (non-dead) planet?
- Sustainability frameworks differ in their definition of the “economic dimension”
- Often no explicit link to economic theory, whether mainstream or heterodox

Farm sustainability assessment tools (SATs)



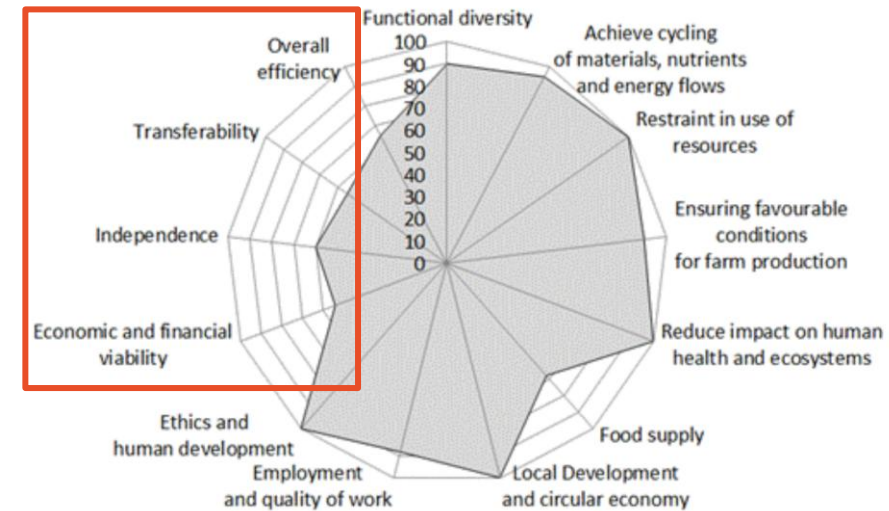
Public Goods Tool (ORC, UK)

Gerrard, C.L., Smith, L.G., Padel, S., Pearce, B., Hitchings, R., Measures, M., Cooper, N., (2011), QCIS Public Goods Tool Development, Report for Defra.



SMART Farm Tool (FiBL, Switzerland)

Schader, C., L. Baumgart, J. Landert, A. Muller, B. Ssebunya, J. Blockeel, R. Weisshaidinger, R. Petrasek, D. Mészáros, S. Padel, C. Gerrard, L. Smith, T. Lindenthal, U. Niggli, and M. Stolze. 2016. Using the Sustainability Monitoring and Assessment Routine (SMART) for the Systematic Analysis of Trade-Offs and Synergies between Sustainability Dimensions and Themes at Farm Level. Sustainability 8:274.



IDEA Tool (Cemagref/INRAE, France)

Zahm, F., P. Viaux, L. Vilain, P. Girardin, and C. Mouchet. 2008. Assessing farm sustainability with the IDEA method – from the concept of agriculture sustainability to case studies on farms. Sustainable Development 16:271–281.

Research questions

1. How has the firm been theorized across different schools of thought?
2. Do different theories help us identify conditions of “economic sustainability”, or at least point at the key factors?
3. Where are the contradictions and disagreements?
4. What implications for sustainability assessment frameworks and indicators?

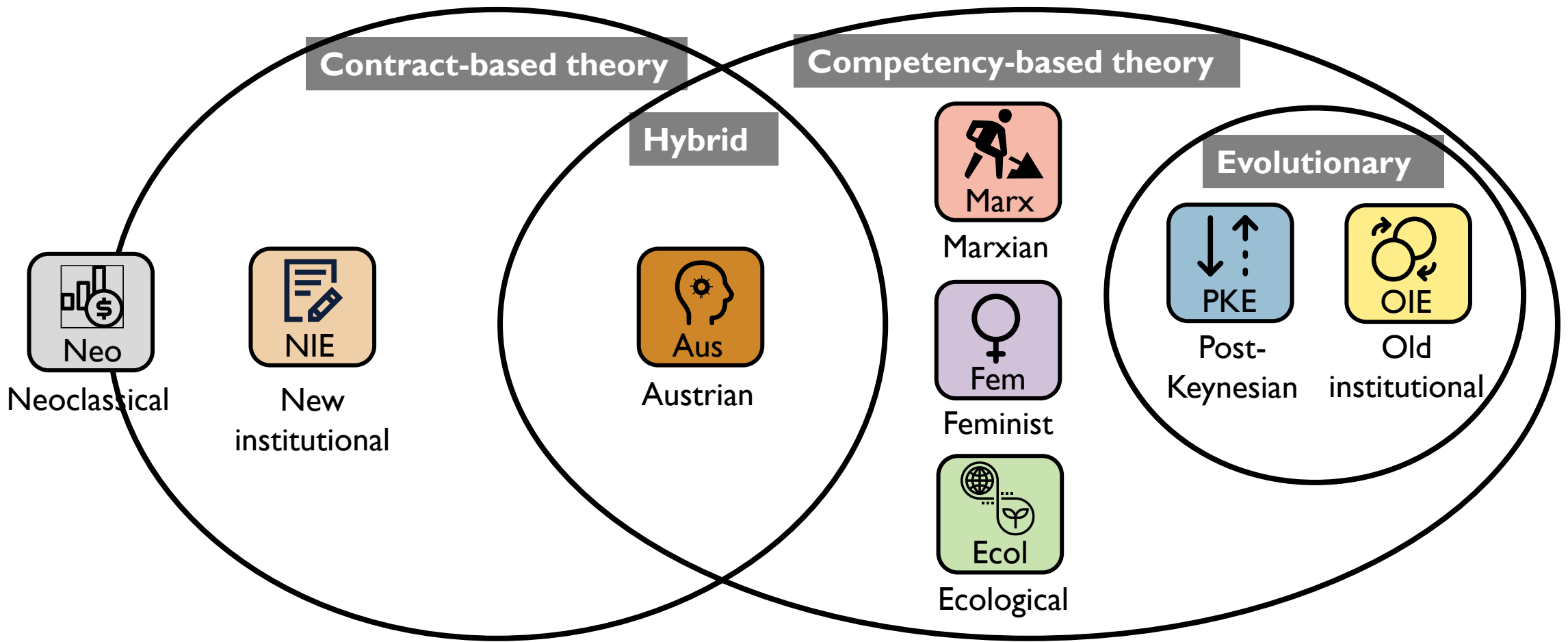
Brief history of the theory of the firm

- Largely absent in classical writings, no theory (e.g. Smith's pin factory)
- Minimal, functional in (early) neoclassical writings (e.g. the Marshallian firm)
- “Old” mainstream theory retained this “functional” view and left the internal workings as a black box
- “New” theory post-1970 opened the black box with a resurgence of Coase's theory of transactions costs and diverse heterodox developments
- Post-2000, very little new development (Hodgson 2019)

Definition of the firm: “...an *integrated and durable organization of people devoted to the production of goods or services that are owned as property under law by the firm...integrated is that it itself acts tacitly or otherwise as a 'legal person,' owning its products and entering into contracts. A sense in which a firm is durable is that it constitutes more than a transient contract or agreement between its core members and it incorporates structures and routines of some expected longevity.*”

Reviewed literature (in progress)

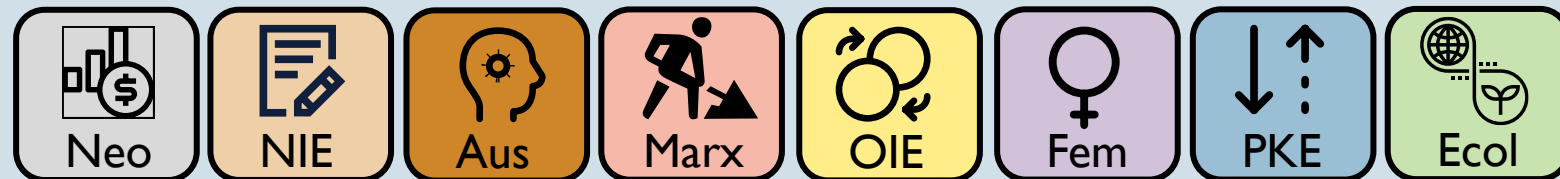
School	Focus	Key literature
All	Multiple accounts of the theories of the firm of different schools of thought in economics.	(Dietrich and Krafft 2012, Schneider 2024)
Neoclassical	The “Marshallian” firm, marginal cost pricing, profit maximization and monopoly vs. competitive equilibrium.	(Mas-Colell et al. 1995, Walker 2016)
New institutionalist	Transaction cost theory of market structure and the existence of firms, contract-based theory (CBT).	(Coase 1937, Williams 1978, Walker 2016)
Austrian	Fundamental uncertainty and disequilibrium, resource-based theory (RBT), stakeholder and entrepreneurial theory.	(Lewin and Phelan 2000, Langlois 2013)
Old institutionalist	Social costs, cultural, legal, political and social influences, cumulative causation, institutional analyses.	(Jo 2019, Hodgson 1998, 2007)
Marxian	Surplus value analysis (creation, appropriation and distribution), productive/unproductive firms/work, class/non-class exploitation, ownership (private, collective, state), cooperation and coordination.	(Shapiro 1976, Thompson 2016, Brennan 2017)
Post-Keynesian	Firm behaviour under fundamental uncertainty, output maximization, finance and expansion frontiers, cost-plus/mark-up pricing, constant/increasing returns to scale.	(Lavoie 2009, 2022, Mbeki 2023, Canale 2023)
Feminist	Invisibility of household production, value creation by women and appropriation by firms (rent-seeking), structural rather than efficient cause (collective, gender-based exploitation).	(Markusen 1977, Braunstein 2008)
Ecological (+ behavioural)	Flow-fund alternative model to production, the firm as a site of biophysical transformation, behavioural model and stakeholder-based theory (SBT).	(Georgescu-Roegen 1971, Couix 2020, Earl 2017)



Adapted from: Hodgson, G. M. 1998. Competence and contract in the theory of the firm I. *Journal of Economic Behavior & Organization* 35:179–201.

Structure of accounts

Icons: <https://www.svgrepo.com>



Contracts buffer against uncertainty

- Transaction costs determine whether to make or buy
- Weak uncertainty (information deficits) mean formulating, monitoring and policing contracts determines efficiency

Private firms are more efficient

- Capital-intensive production requires specialization and hierarchy, which workers won't impose on themselves
- Explains the prevalence of privately-managed/owned rather than collectively-managed/owned firms



2

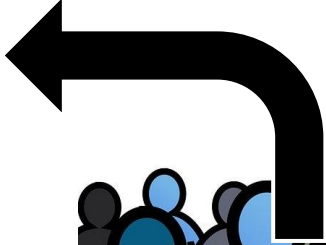


1

Why do firms exist?

- Neoclassical theory posits a world of individuals
- Why do firms exist at all? - islands of cooperation and coordination in a competitive environment

3



The “new” institutionalist firm: “make or buy?”

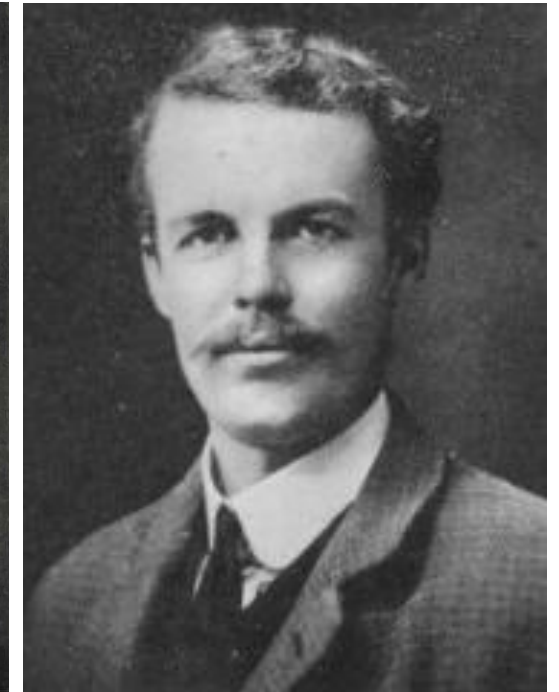
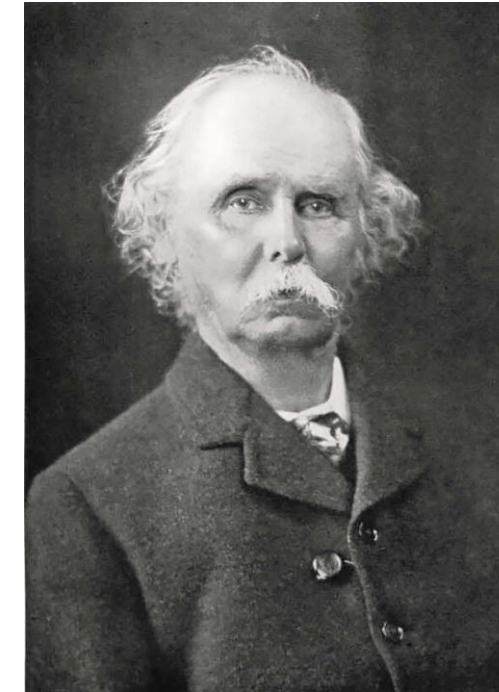
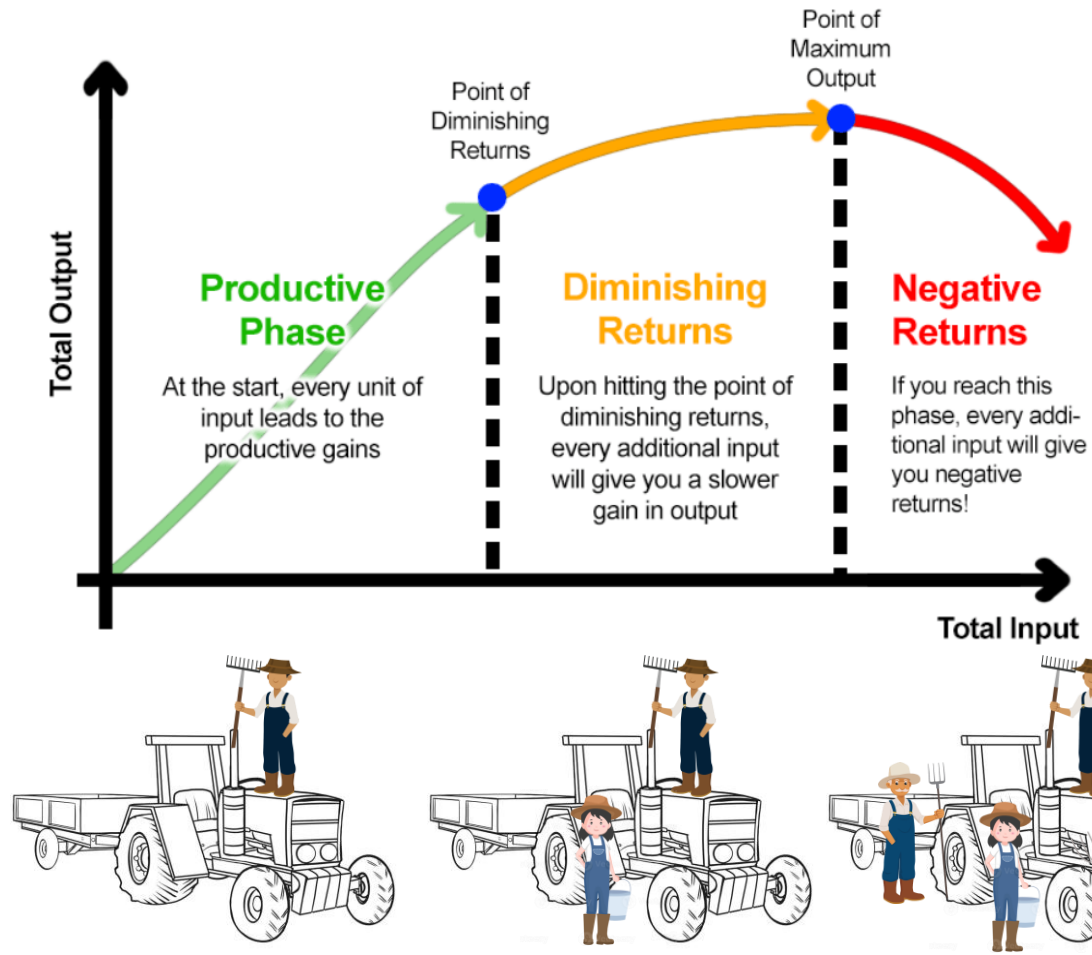


Diminishing returns to scale

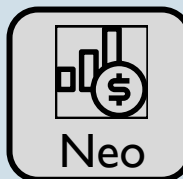
- Less profit as the firm produces more
- One “factor” is fixed in the short-term

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The neoclassical firm: “the zombie maximiser”



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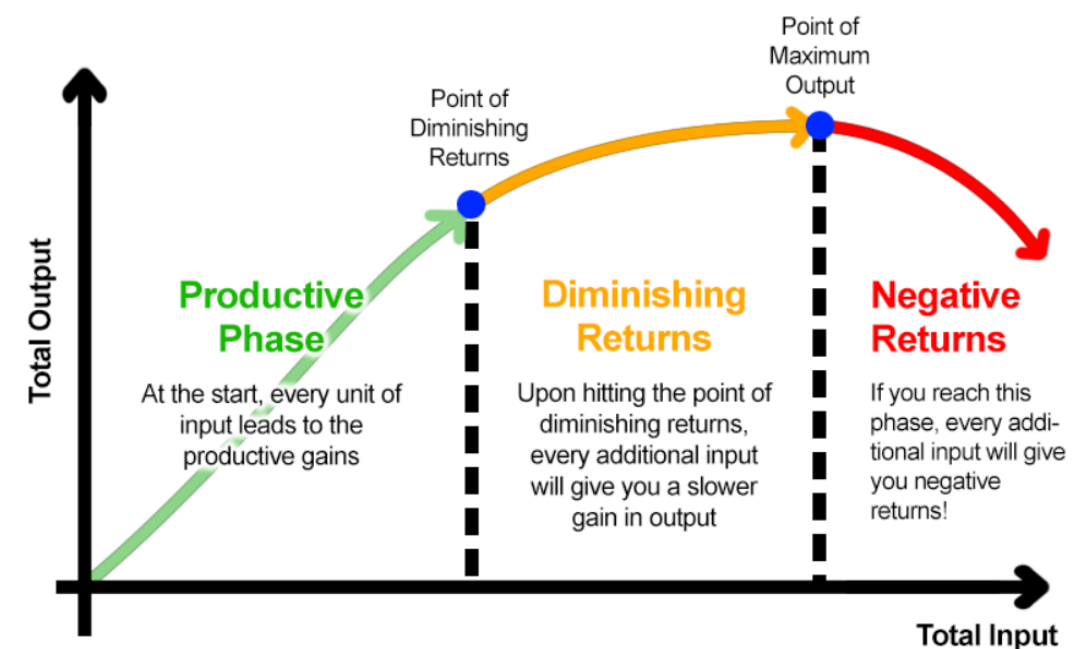


Perfect competition

- Nothing the firm does will affect the price, either of the purchased inputs or the sold products

1

2



3

Marginal pricing

- The firm produces until costs of last unit to be produced = market price (point of zero profit)
- Rents (super-normal) profits are eliminated
- More output than (profit-maximizing) monopoly

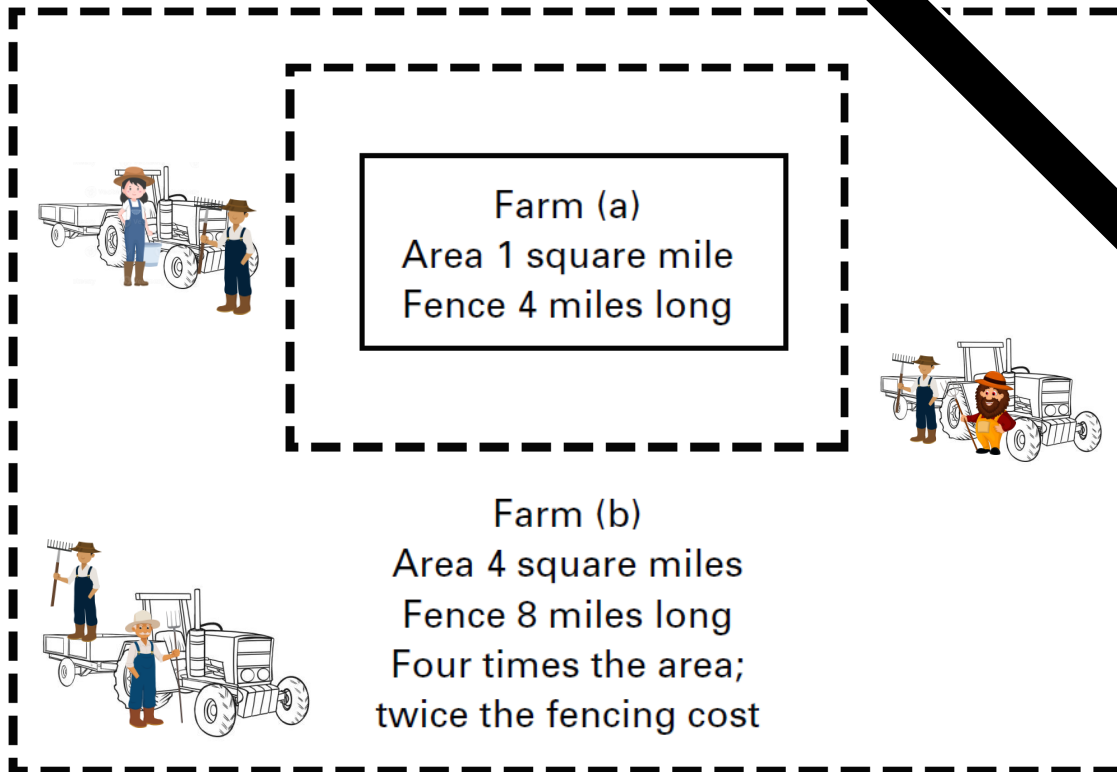
The neoclassical firm: “the zombie maximiser”



Constant or increasing returns to scale

- No “fixed” capital for the individual firm
- Economies of scale out-weigh disadvantages
- Producing more means producing cheaper

Sraffa, P. 1926. The Laws of Returns Under Competitive Conditions. *Economic Journal* 36:535–50.
Keen, P. S. 2011. *Debunking Economics: The Naked Emperor Dethroned?* Zed Books Ltd.



*“When I teach, I start from supply and demand, the theory of comparative advantage, how firms maximize profits. We really know that stuff. **We are pretty sure that firms maximize profits by setting marginal revenue equal to marginal costs.** I’m absolutely confident that one hundred years from now we are not going to say that we got that wrong.”*

- Mankiw, The Challenges Facing Monetary and Fiscal Policy, Speech at Princeton University, October 20th, 2011)

Marginal pricing

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The post-Keynesian firm: “winner takes all”



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Marginalist controversy:
average cost pricing (ACP) vs.
marginal cost pricing (MCP)

Surveys consistently also show
that firms exhibit constant or
positive returns to scale

There is no limitation on capital
(i.e. it is not “fixed”). Factories
are underutilized by ca. 20%, due
to lack of demand (88% of
responses).

Boehm, C. E., and N. Pandalai-Nayar. 2022.
Convex Supply Curves. *American Economic
Review* 112:3941–3969.

Altomonte, C., A. Barattieri, and S. Basu. 2015. Average-cost pricing: Some evidence and implications. *European Economic Review* 79:281–296.

Table 2
Average cost pricing, by industry.

US data

NACE2	ACP (%)
Tobacco products	100.0
Other transport equipment	82.9
Office machinery and computers	80.0
Food products and beverages	77.6
Wood and of products of wood and cork	77.1
Dressing of leather; manufacture of luggage, handbags, saddlery, harness	77.0
Other non-metallic mineral products	76.1
Machinery and equipment n.e.c.	75.6
Wearing apparel; dressing and dyeing of fur	75.3
Recycling	75.0
Chemicals and chemical products	74.7
Medical, precision and optical instruments, watches and clocks	74.1
Textile	73.6
Basic metals	73.4
Fabricated metal products, except machinery and equipment	73.1
Furniture; manufacturing n.e.c.	72.2
Electrical machinery and apparatus n.e.c.	71.7
Rubber and plastic products	71.5
Coke, refined petroleum products and nuclear fuel	71.4
Motor vehicles, trailers and semi-trailers	66.7
Radio, television and communication equipment and apparatus	66.3
Pulp, paper and paper products	66.3
Publishing, printing and reproduction of recorded media	64.5
Total	73.4

See also: Blinder (1991, 1994) and Blinder *et al.* (1998) for the United States, Köhler (1996) in Germany, Hall *et al.* (1997, 2000) in the UK, Apel *et al.* (2005) in Sweden, Fabiani *et al.* (2005) for Europe and Amirault *et al.* (2004) in Canada.

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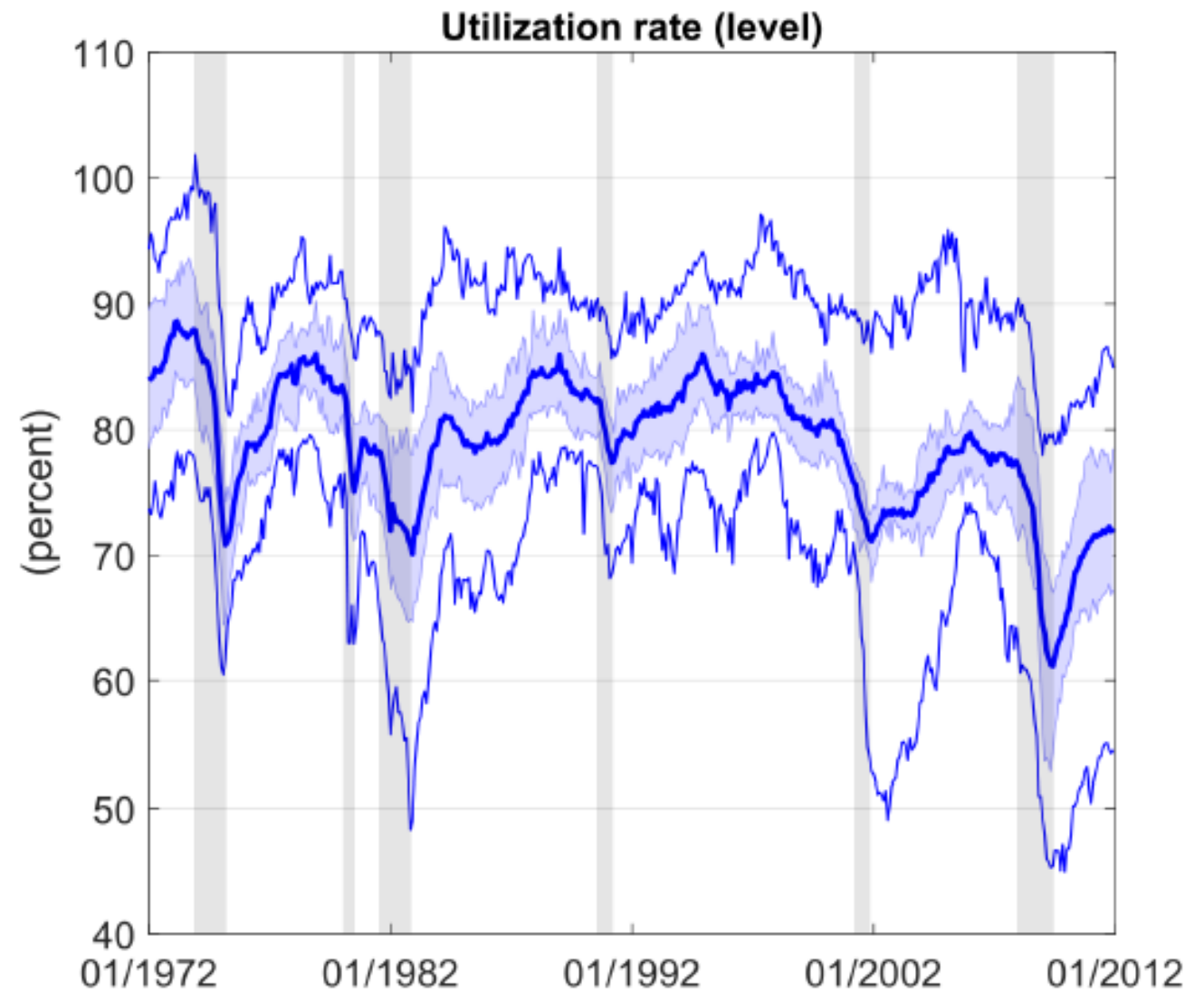
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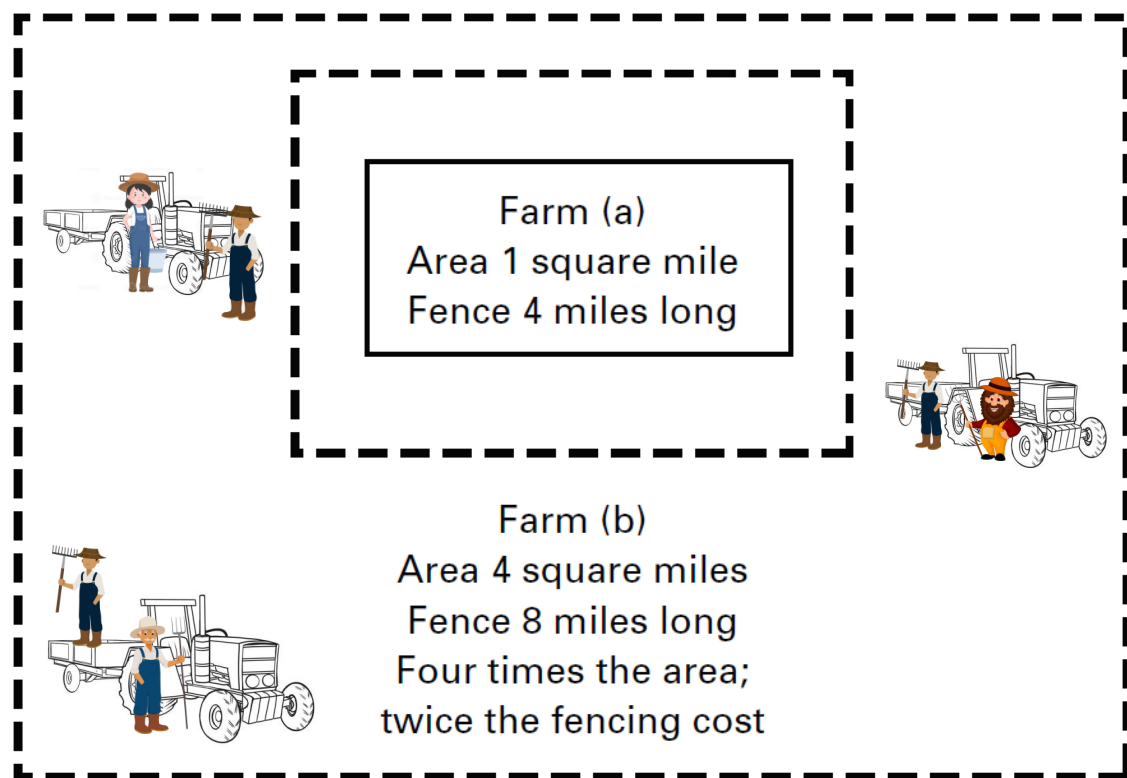
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Competition naturally leads to oligopoly

- Several large, powerful firms (price makers)
- Many smaller firms (price takers)
- Firms aim to survive under strong uncertainty
- Maximize growth rate to attain market power

Sraffa, P. 1926. The Laws of Returns Under Competitive Conditions. Economic Journal 36:535–50.
 Keen, P. S. 2011. Debunking Economics: The Naked Emperor Dethroned? Zed Books Ltd.



Lavoie, M. 2009. Introduction to Post-Keynesian Economics. Springer.

Table 2.2: Different approaches to pricing and markets

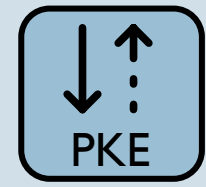
Author	Post-Keynesian theory	Neoclassical theory
Kalecki (1971)	Cost-determined prices	Demand-determined prices
Means (1936)	Inflexible prices Administered prices	Flexible prices Market-clearing prices
Sawyer (1995)	Firm-determined prices Long-term strategic prices	Market-determined prices Short-term prices
Okun (1981)	Price maker Price-tag markets	Price taker Auction-market prices
Hicks (1974)	Fix-price markets	Flex-price markets
Chandler (1977)	Visible hand of management	Invisible hand of markets

3

Pricing based on average costs + mark-up

- Pricing is long-term, strategic, cost-based
- Buffer capacity and buffer stocks of resources
- Limited by finance, post-production costs and lacking demand

The post-Keynesian firm: “winner takes all”



THE THEORY OF THE LEISURE CLASS



THORSTEIN VEBLEN

The evolving institutionalist firm

- Veblen-Commons “predatory” business enterprise
- Means’ corporation, internal/external “controllers”
- Galbraith’s large corporations and “technostructure”
- Dugger’s conglomerates and corporate managers
- Eichner’s megacorp oligopoly, pricing, growth

Pricing based on average costs + mark-up

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The old institutionalist firm: “the Agency”



Strategic behaviour

- Tensions between shareholders, absentee owners, executive board and managers determine growth rate and size structure (not resource restraints)
- Finance, credit and “retained earnings” as key determinants of “administered prices”

2

1

The evolving institutionalist firm

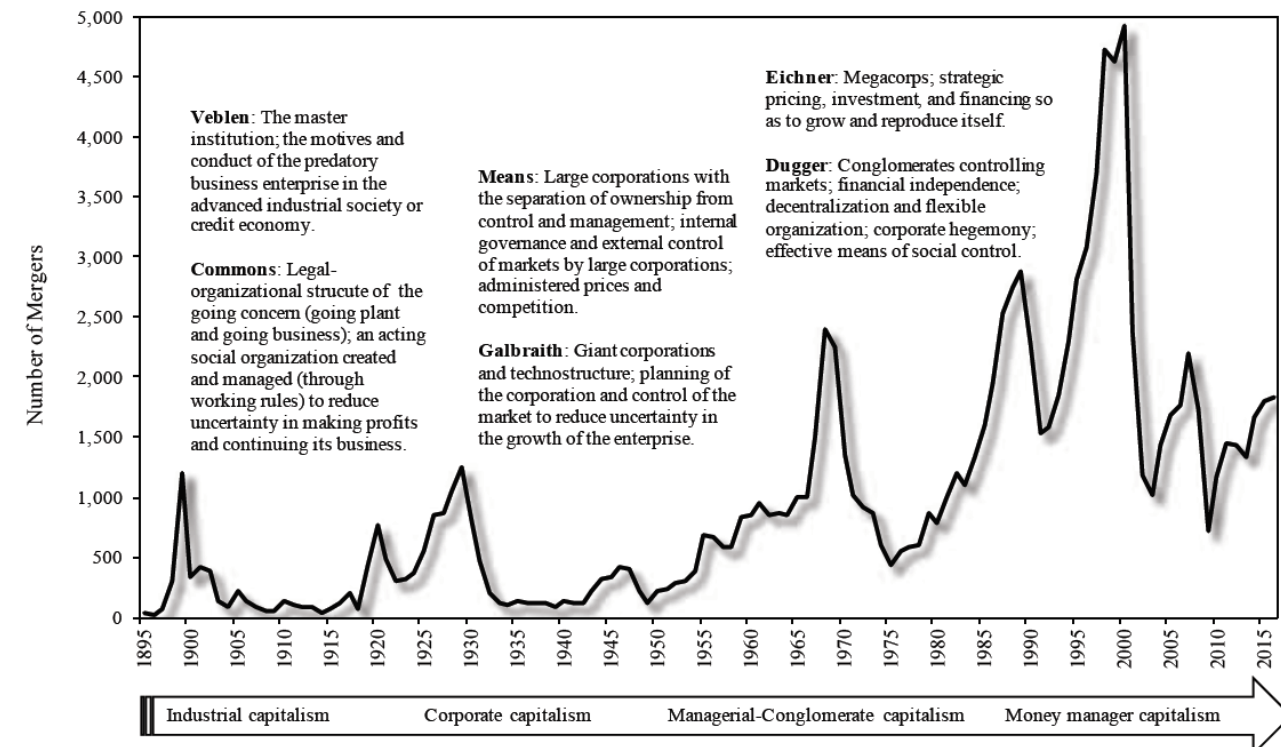
- Veblen-Commons “predatory” business enterprise
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3

Size matters, power speaks

- Firms must be differentiated by size and power (price makers, price takers, niche markets etc.)
- Internal and external relations between actors are crucial to understand firm behaviour
- Organizational (legal) form determines function

Figure 1: The institutionalist theory of the business enterprise and the evolution of capitalism



The old institutionalist firm: “the Agency”



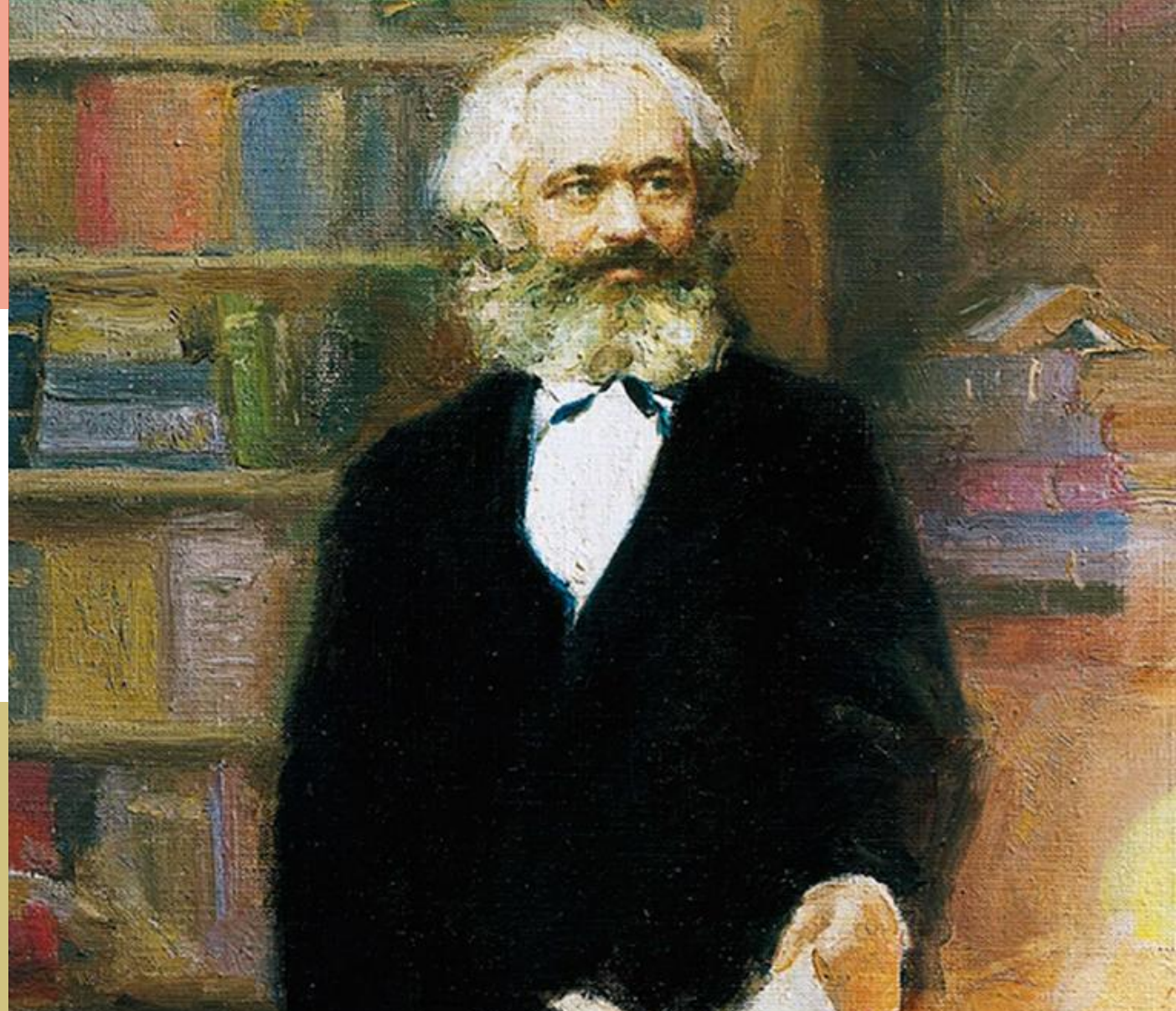
Marxian surplus value analysis

- The creation, appropriation and distribution of value
- Productive workers create value, capitalists appropriate part of it by virtue of ownership
- Unproductive work/firms also exist, but do not create value (take a cut or enforce capitalist control)



Size matters, power speaks

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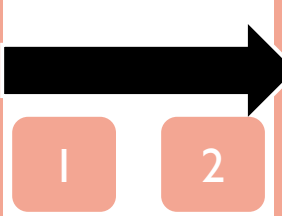


The Marxian firm: “property is power”



Marxian surplus value analysis

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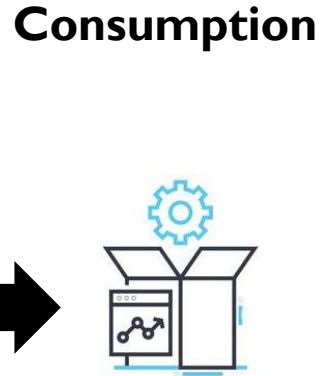
Not just worker exploitation!

- Capitalist-worker relationship is the core of Marxist analysis, but is only a part of the story
- Wider relations with internal/external actors, distribution of value, class/nonclass relations



Productive work:
Production of a good or service

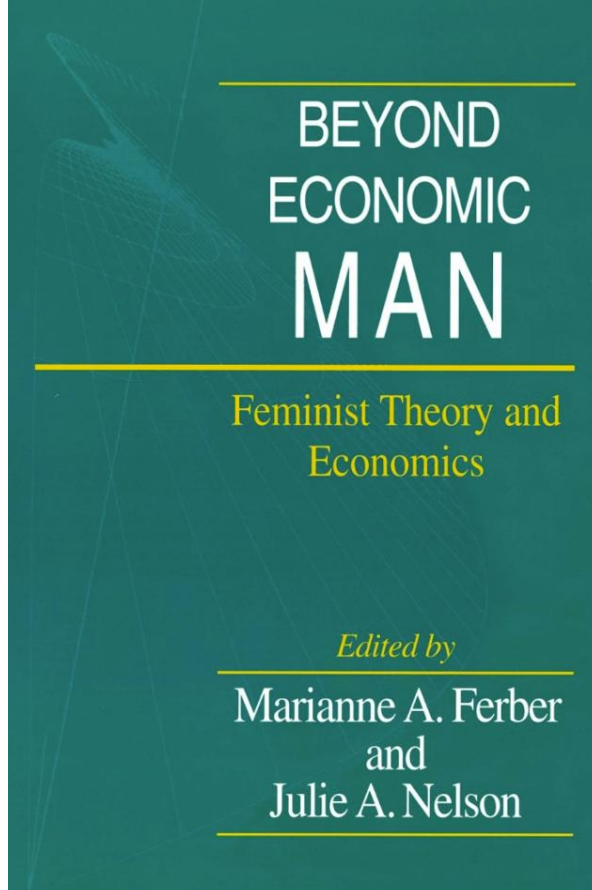
Unproductive work:
Management, admin, marketing, etc.



3

Ownership, coordination and cooperation

- Rejection of the NIE (Coase/Williamson) efficiency explanation of the domination of private firms
- Work-owned cooperatives limited by finance rather than efficiency/hierarchy explanations



Value is appropriated by firms from households

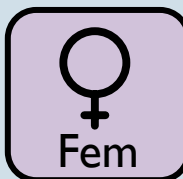
- Household production “invisible” (redistributive/reciprocal)
- Capitalist firms subsidized by households (reproduction of labour, unpaid work by women)



Ownership, coordination and cooperation

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- Work-owned cooperatives limited by finance/power rather than efficiency/lacking hierarchy

The (anti-)feminist firm: “the invisible household”



Role of structure, not choice, in gender hierarchies

- Gender as a source of structural “rents”, extracted collectively by the male sex, not a matter of efficiency

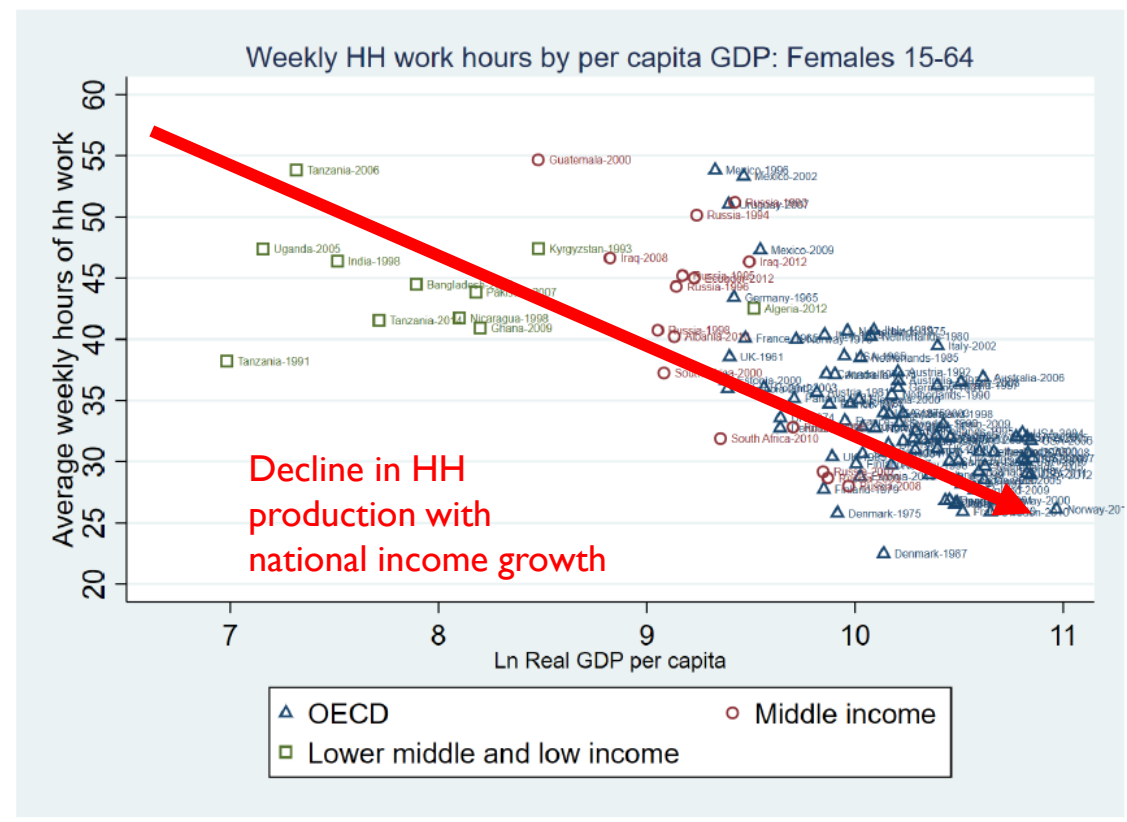
Braunstein, E. 2008. The Feminist Political Economy of the Rent-Seeking Society: An Investigation of Gender Inequality and Economic Growth. Journal of Economic Issues 42:959–979.

		Source of Will	
		<i>Egoistic</i>	<i>Altruistic</i>
Beneficiary	<i>Individual</i>	(1) Individual utility-maximizing bargaining & rent-seeking	(2) Other-regarding utility maximization
	<i>Collective</i>	(3) Individual and collective interests coincide; organizational rent-seeking; patriarchal collective action	(4) Selfless action in support of larger social ideals or cultural values; meta-preferences

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- Household production “invisible” (redistributive/reciprocal)
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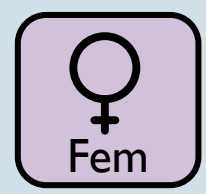
“...where patriarchal rents were siphoned into growth-enhancing investments as well as payoffs for male labour aristocracies. **That the social costs of inequality were counterbalanced by public investment and household structures is a puzzle that the neoclassical institutionalist paradigm could really never sort out because there is no theory of collective exploitation.**”



Commodification of care work has created a low-income class of worker, mainly occupied by women (cleaning, childcare, social care etc.)

Dinkelman, T., and L. R. Ngai. 2021. Home production, women’s market work, and structural transformation. STEG Pathfinding Paper:57–80.

The (anti-)feminist firm: “the invisible household”



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Entrepreneurship under uncertainty

- All income is rent, i.e. payment to use a resource
- Disequilibrium context where value estimates differ

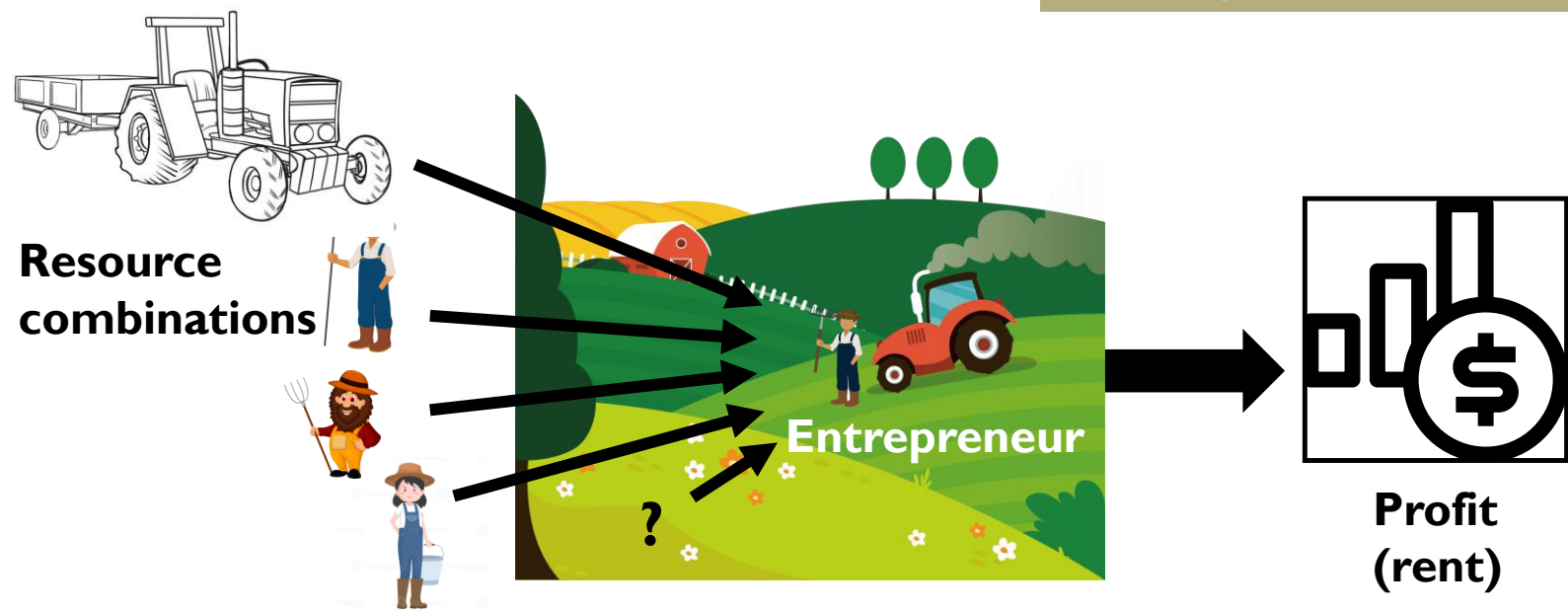


The Austrian firm: “legal swindling”



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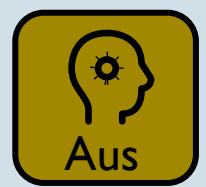
Realization of emergent value

- Schumpeterian entrepreneurs better estimate the value of resources to pocket the difference
- “Entrepreneurial judgement” is the core of the firm

Resource-Based Theory (RBT)

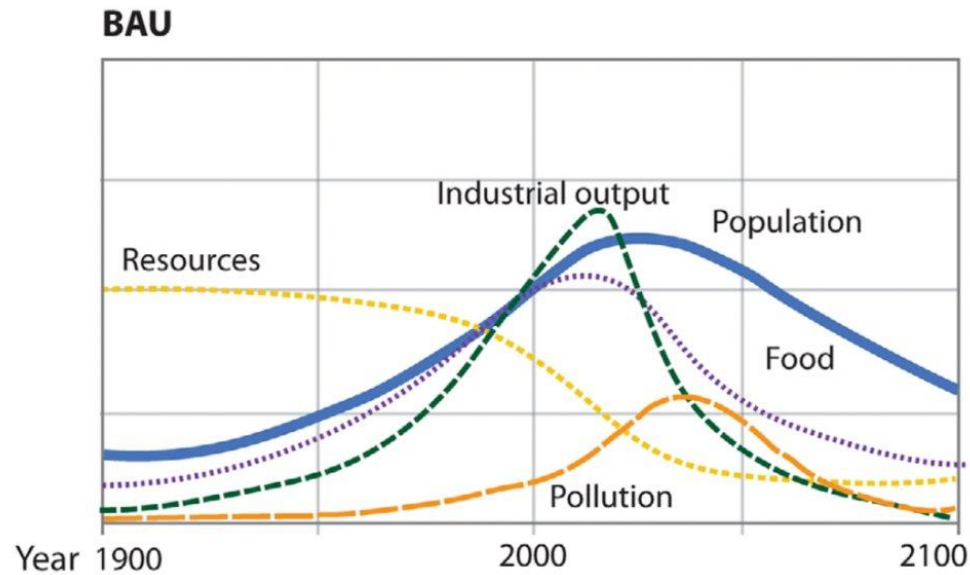
- Tangible resources (plants, equipment, land, resources, waste, finished goods etc.); and
- Human resources (unskilled and skilled labour, clerical, administrative, financial, legal, technical, managerial knowledge)
- Resource distribution is accepted by society

The Austrian firm: “legal swindling”



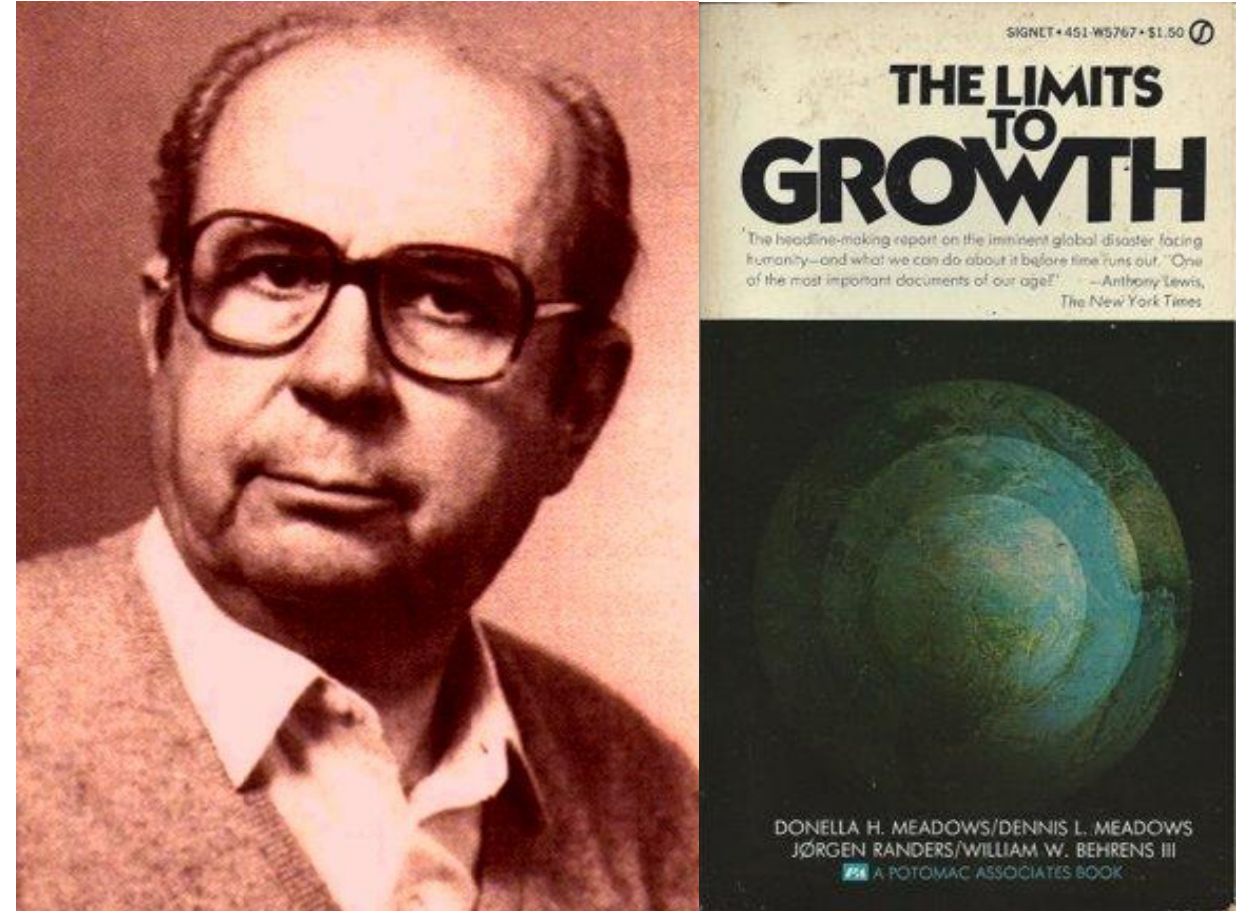
Flow-fund model of production

- Where do resources come from? How are they produced?
- Challenge the “production function” with a more realistic fund-flow model of production

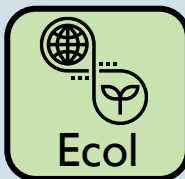


Realization of emergent value

- Schumpeterian entrepreneurs better estimate the value of resources to pocket the difference
- “Entrepreneurial judgement” is the core of the firm



The (un-)ecological economic firm: “matter (and energy) matters!”



Flow-fund model of production

- Where do resources come from? How are they produced?
- Challenge the “production function” with a more realistic fund-flow model of production

Couix, Q. 2020. Georgescu-Roegen’s Flow-Fund Theory of Production in Retrospect. Ecological Economics 176:106749.

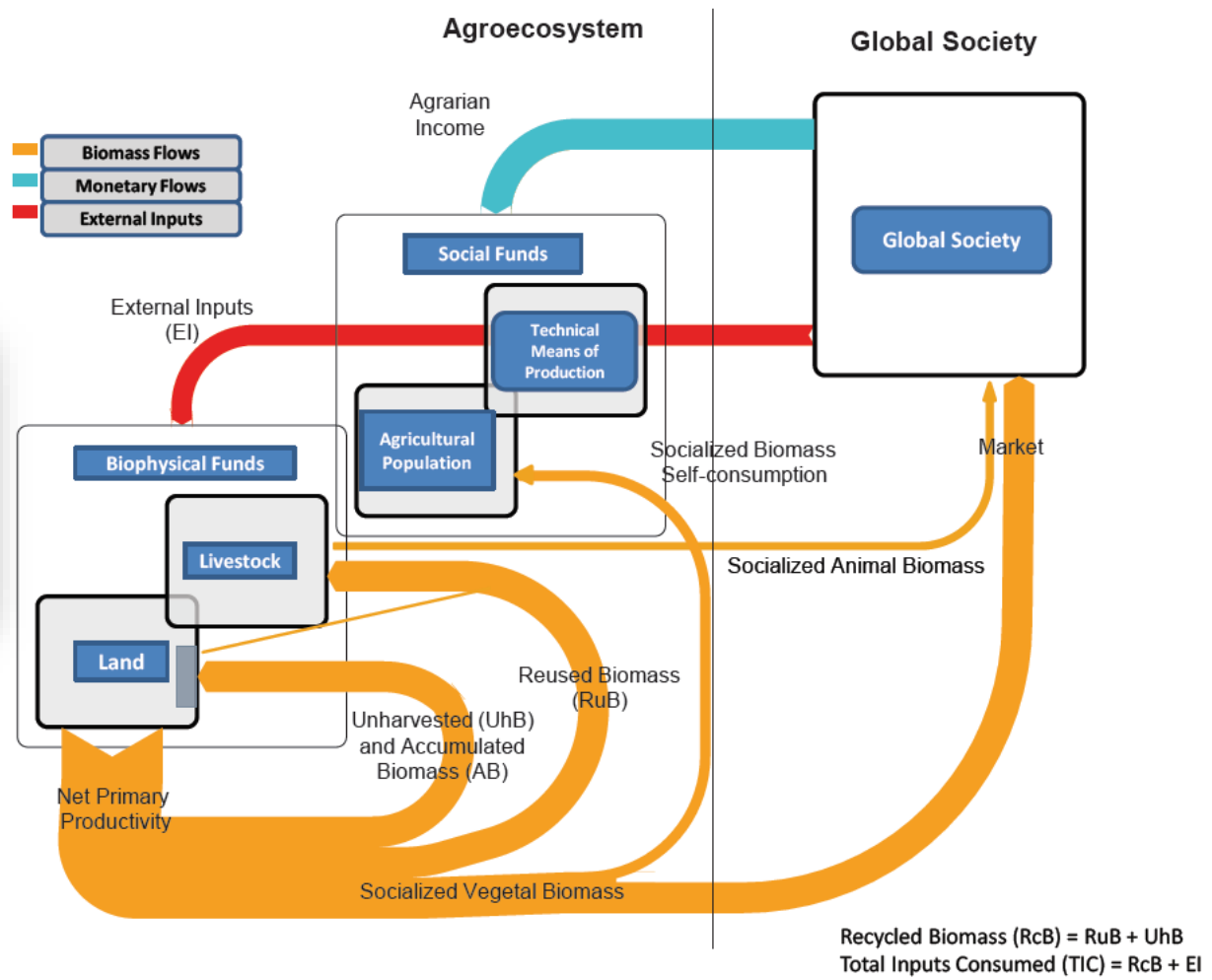
Table 1: Flow-Fund Table of Multiple Processes

	P_1	P_2	N	P_3
<i>funds</i> : elements that enter <i>and</i> leave the process, providing certain services over a certain period. They are never physically incorporated in the product. For example, workers, land and capital equipment in the production process of shoes. ²				
<i>flows</i> : elements that either enter <i>or</i> leave the process, but not both, that is, ‘elements which appear only as input or only as output’ (Georgescu-Roegen 1970, p. 4). Some flows enter the process and are then ‘incorporated’ in the product (e.g. energy and leather in shoe production); whereas some others only leave it (the shoes and waste generated by the production activity).				
C	C_1	C_2	*	*
L	L_1	L_2	*	L_3
H	H_1	H_2	*	H_3

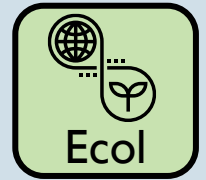
Biophysical embeddedness and behavioural realism

- Firms in EE seen as “coalition of diverse stakeholders”
- “Satisficing” behaviour under strong uncertainty, benchmark to rivals rather than the past or optima

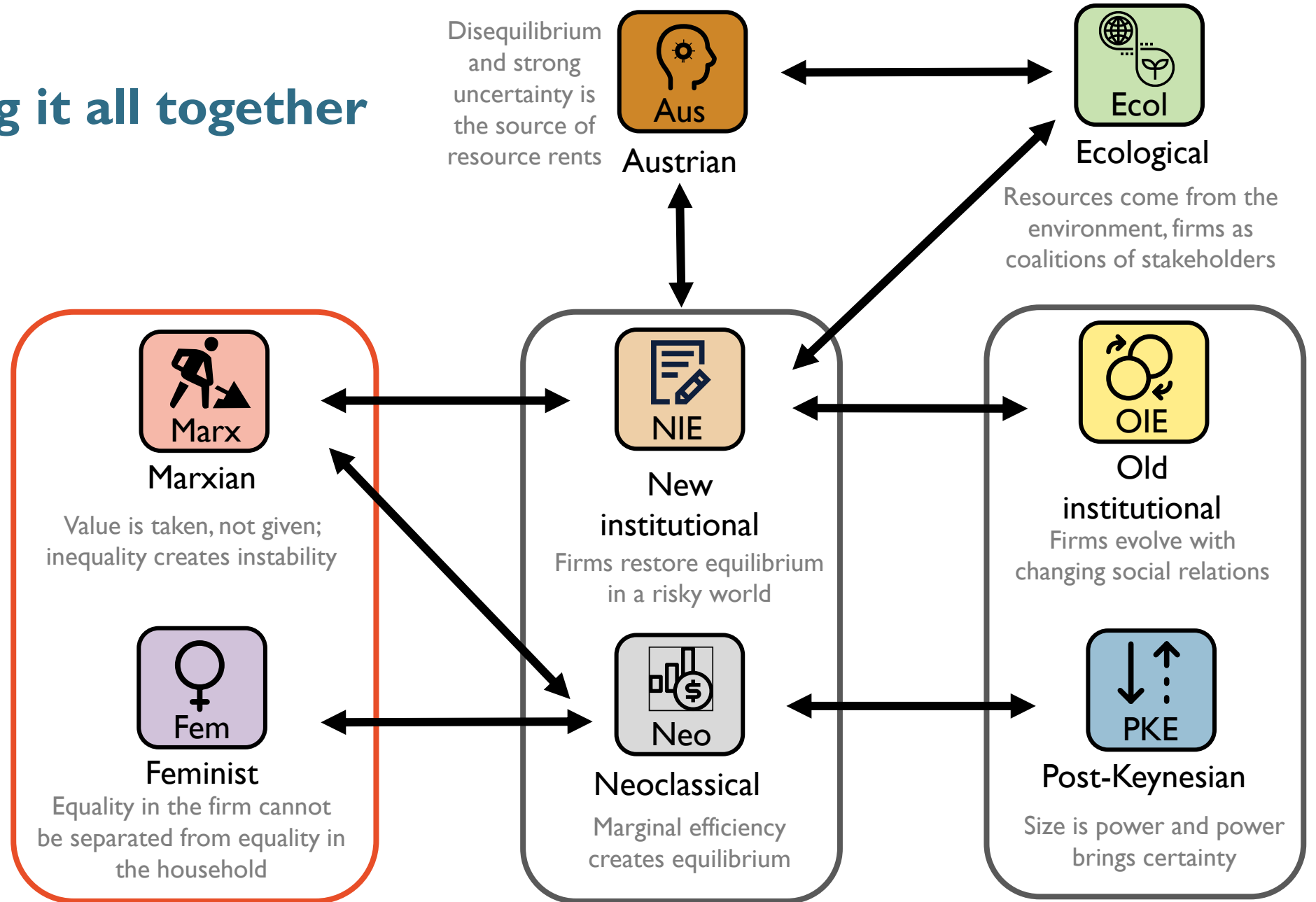
González de Molina, M., D. Soto Fernández, G. I. Guzmán Casado, J. Infante Amate, E. Aguilera Fernández, J. Vila Traver, and R. García Ruiz. 2020. The social metabolism of Spanish agriculture, 1900-2008: the Mediterranean way towards industrialization.



The (un-)ecological economic firm: “matter (and energy) matters!”



Gathering it all together



What is economic sustainability?

- Existing sustainability assessment frameworks compartmentalize the “economic dimension”

Sustainability Dimension/ SAFA themes	Standardized Indicators	Typical Units		Primary Production	Processing	Distribution	Consumption
Economic Investment	Net present value	€/kg; €/ha	●	+	+		
	Net income	€; €/ha	●	+			
	Total costs	€	●	+	+		
	Gross margin	€/kg	●	+	+		
	Profitability	€; €/ha	●	+			
	Production output	kg olive/ha; L olive oil/ha; €/ha/year	●	+			
	Labor productivity	€/labour unit; kg/ha/worker	●	+	+		
	Production costs	€/ha	●	+			
	Yield (crop)	kg/ha; ton/ha	●	+			
	Product Quality and Information	Product quality, safety, and compliance	dimensionless; score	●	+	+	
Vulnerability	Internal rate of return	%	●	+			
	Autonomy (financial and external inputs)	dimensionless; score	●	+	+		

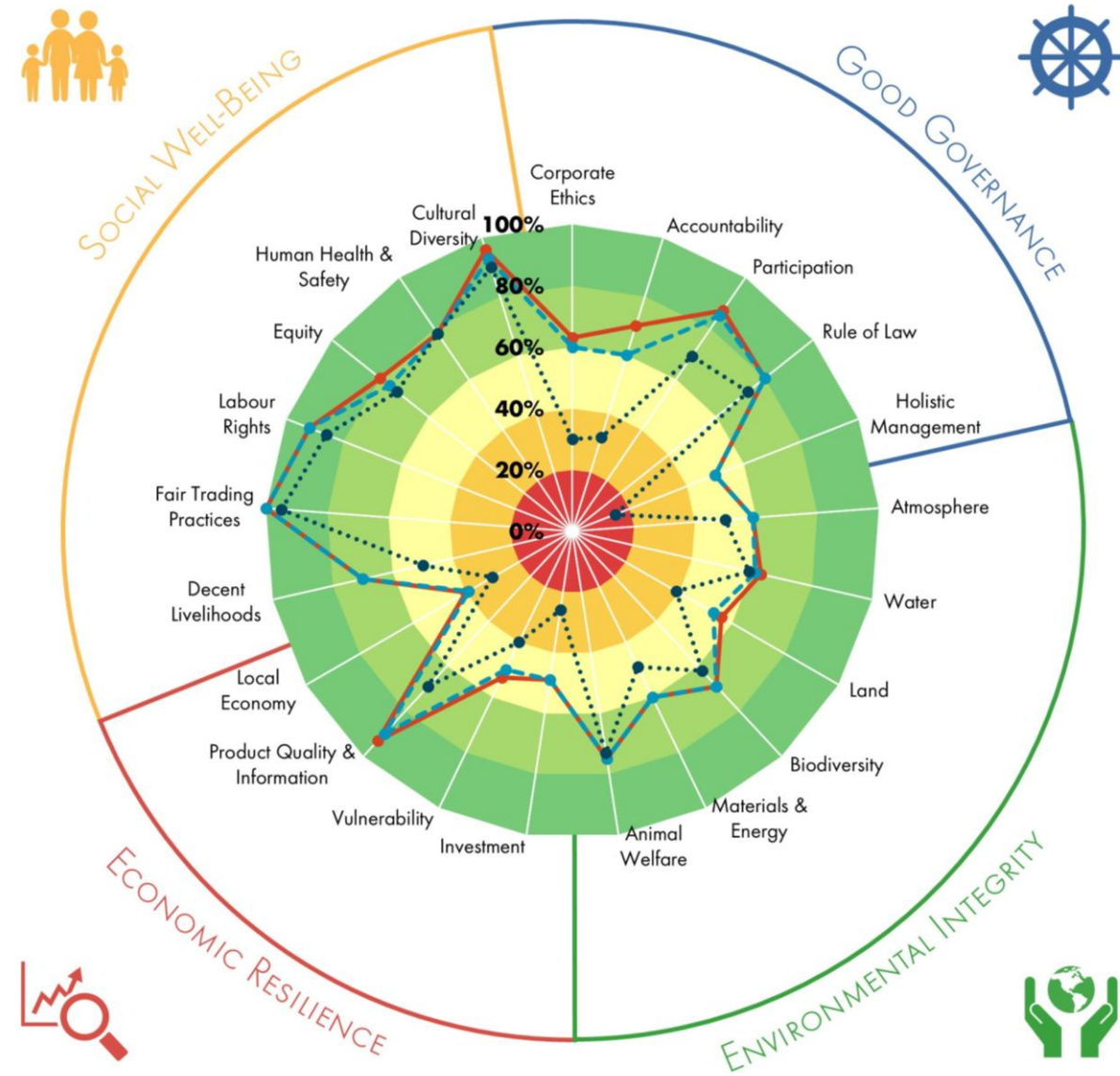
Key: Number of studies ● ≥ 30% ● ≥ 25% ● ≥ 20% ● ≥ 15% ● ≥ 10% ● ≥ 5%

SAFA Theme	Topic
Investment	Internal improvement
Investment	Community investment
Investment	Long-ranging investment
Vulnerability	Financial stability
Vulnerability	Supply stability
Vulnerability	Production stability
Vulnerability	Market stability
Vulnerability	Liquidity
Resilience	Autonomy
Resilience	Adaptability
Resilience	Diversification
Resilience	Transferability
Resilience	Risk mitigation
Productivity	Land productivity
Productivity	Labour productivity
Productivity	Capital productivity
Profitability	Revenues
Profitability	Costs
Profitability	Profits
Profitability	Efficiency (allocative, technical, financial)
Product quality and information	Food safety
Product quality and information	Product quality
Product quality and information	Product information
Local economy	Local procurement
Local economy	Business cooperation
Local economy	Local sales (short food supply chains)
Local economy	Value creation

Blisset, K. 2023. Indicators of sustainability in Mediterranean olive value chains: Building knowledge for the transition to sustainable food systems. ISARA and Norwegian University of Life Sciences, Lyon and As.

What is economic sustainability?

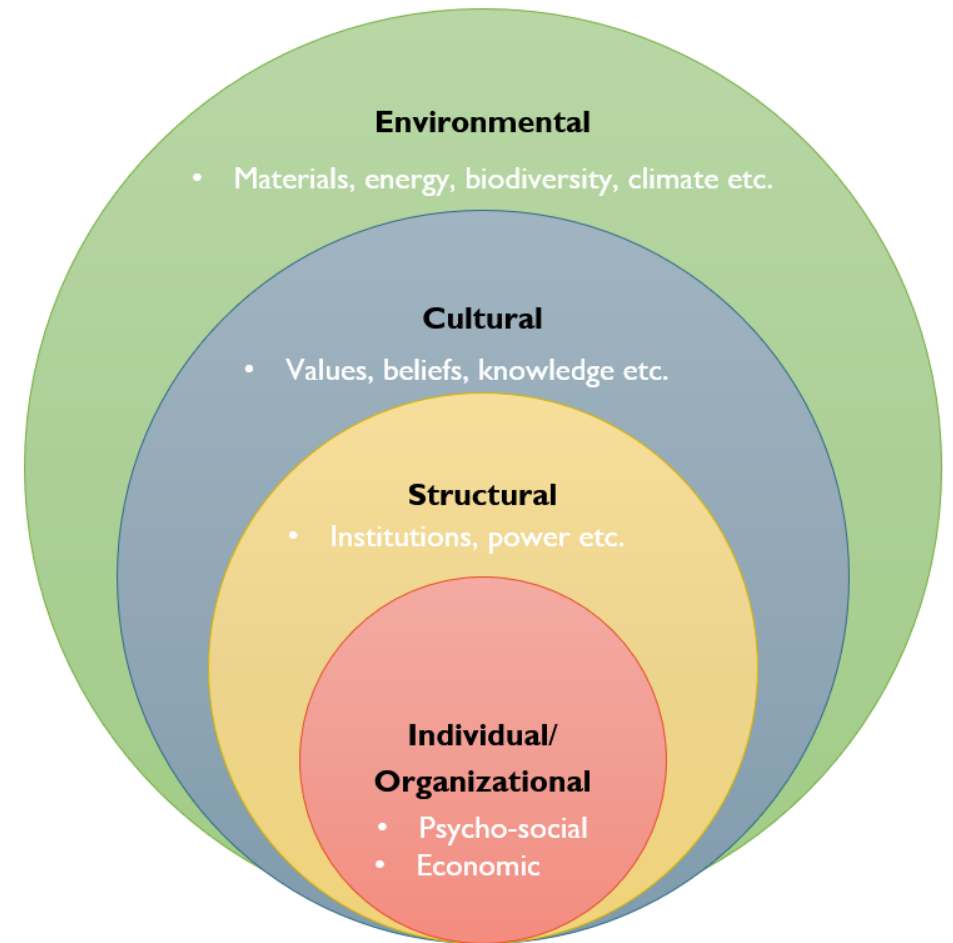
- Existing sustainability assessment frameworks compartmentalize the “economic dimension”
- A pluralist view cannot support this separation of the economic from the social, political and environmental



What is economic sustainability?

- Existing sustainability assessment frameworks compartmentalize the “economic dimension”
- A pluralist view cannot support this separation of the economic from the social, political and environmental
- Instead, should adopt a “systemic view” of sustainability, with the “economic” a minor sub-criterion rather than a supporting “pillar”

Embedded systems social-ecological ontology



Principal investigators



Project partners



Financing

