

Assumptions for a libertarian effort-management economic theory

ABSTRACT

In this paper I offer new assumptions for an effort-management theory for economic activity. I begin by reviewing classical assumptions that resources possess value in use and are scarce that are adopted in resource-based theories for efficient allocation through competition. I suggest that economic theory developed under those assumptions has been useful only for explaining short-term activity when unrealistic conditions are applied and has not been useful for explaining innovation, unexpected change, or economic growth. Further, these assumptions support a justification to any who may wish to reduce the size of the human population. In this paper I argue that an economic theory for allocation of scarce resources has been misguided if resources are not indeed scarce. Instead, I offer the assumption that economic systems are limited by personal effort. Under this new assumption, I suggest an economic system may be analysed using complexity mathematics as an open complex system driven by independent agents who maximise benefit per effort, and in which interaction among agents is provided by the transfer of products.

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INTRODUCTION

Calls for the reduction of the human population to fewer than two billion¹ are based on flawed assumptions at the heart of economic theory. In their place, I offer Libertarian² effort-management assumptions that may be considered for a future model for analysis using complexity mathematics³.

Our present understanding of economic theory, developed over the past three centuries, has been founded on two assumptions: that resources possess inherent *value in use*⁴, which is beneficial if not vital and is carried to the user when the resource is used; and that we compete for goods, or products, because economic activity is limited by the *scarcity* of resources that are combined to make those products.

Those two assumptions have led academic economists to the concept that the heart of an economic system, the pump itself, is utility-maximising people aiming to satisfy wants by acquiring resources through exchange or production⁵.

Of course, products are indeed transferred between different people. Product transfer enables our economic system to produce more benefits than it otherwise would, because people are able to gain scale efficiencies by specialising in multiple copies of a product for use by others. It is essential for explaining how, in sufficiently-stable systems, the volume of supply of a product tends to approach the volume of demand, at an equilibrium price. And as I will say later in relation to a proposed 'effort-management theory for economic behaviour', product transfer also provides the interactions among agents that are required for the emergence of organised complexity from a complex system.

However, present economic theory is inadequate in several respects. Although the two assumptions are adopted for development of static mathematical models that are useful for stable economic systems, those models are not useful for more realistic systems that may

¹ In US 'billions', so this target is two thousand million people

² By 'Libertarian' I mean a philosophy based on the God-given free will of each person and the right of each to live without interference, subject only to His laws, which are modelled in the secular philosophy of liberal democracy as the duty to do no harm except in self defence.

³ A system of many agents who can interact with each other and is open to exchanges of materials with its environment may be analysed as an 'open complex system' (von Bertalanffy, 1950: 155). In such a system, people may act in a way that promotes the emergence of 'organised complexity' (Weaver, 1948: 4) even if they are not conscious of the system they form, or indeed of Adam Smith's 'invisible hand' discussed in *Wealth of Nations* (1776).

⁴ Smith separated the ideas of 'use value' (inherent in material resources) from 'exchange value', suggesting that, though we desire the value in use of products, we exchange products in the ratio of labour expended to extract and combine them. Marx's view (*Das Kapital*, 1867) was similar in so far as naturally available free resources such as "land, wind, water, metals in situ, and timber in virgin forests" could be thought of as creating "... use-value without contributing to the formation of exchange-value" of the product being formed. But Marx's view differed in regarding 'useful' labour as not only contributing to exchange value, but as also adding use value, alongside the preserved inherent use value of resources, to make useful products. This implies that, unless the value of hauling a product to a distant place is considered not to be 'useful', a person who uses a product that has been laboriously hauled is thought of as receiving more Marxian value in use than a person who uses an indistinguishable product obtained from a store situated at the producer's gate. Nevertheless, adding the value in use of 'useful' Marxian labour to end products does not change the neoclassical equations for modelling equilibrium because these are based on exchange value only.

⁵ Joseph Schumpeter, *The Theory of Economic Development* (1949), Chapter 1, page 3 "... we are concerned only with that economic conduct which is directed towards the acquisition of goods through exchange or production ..."

change unexpectedly; they allow predictable uses of resources but not novelty; they do not adequately cater for economic growth; and as mentioned, they support a justification to any who may wish to reduce the size of the human population.

Further, I argue that the two assumptions serve as a fragile theoretical foundation if economic activity is *not* limited by the scarcity of resources. And I point out that the transferring of products between people at a moment in time arises in an already-driven system: it is not the causal drive; it is not the heart.

If an economic system is not limited by the scarcity of resources, then it could be regarded as misguided to model one as a resource-management system. Instead, I suggest that economic activity is limited by the supply of personal effort, and that a person can be thought of a benefit-per-personal effort maximiser who seeks to gain as much benefit as possible from wielding that effort. Such a person drives what can be called an effort-management system by wielding effort in the present to increase *future* benefit. In such a system a person can be viewed as having the ability to transfer personal effort in the present to its future self.

PRESENT ECONOMIC THEORY HAS BEEN USEFUL FOR SHORT-TERM ANALYSIS

Our present conception that people drive the system by competing to acquire products so that we can maximise the utility of scarce resources seems to align neatly both with our observations and with the body of theory for explaining the tendency of supply to balance demand in the short term. But bear in mind, our daily observation of the sun apparently going around the earth aligns with once dominant pre-Copernican theory⁶.

From the two assumptions underlying present theory: that people acquire products for the purpose of deriving benefits from using them (because products possess *value in use*); and that economic activity is limited by the *scarcity* of the resources needed to make those products, it is a short step to thinking of people, the agents in our economic system, as ‘utility maximisers’ who compete to maximise the utility of resources.

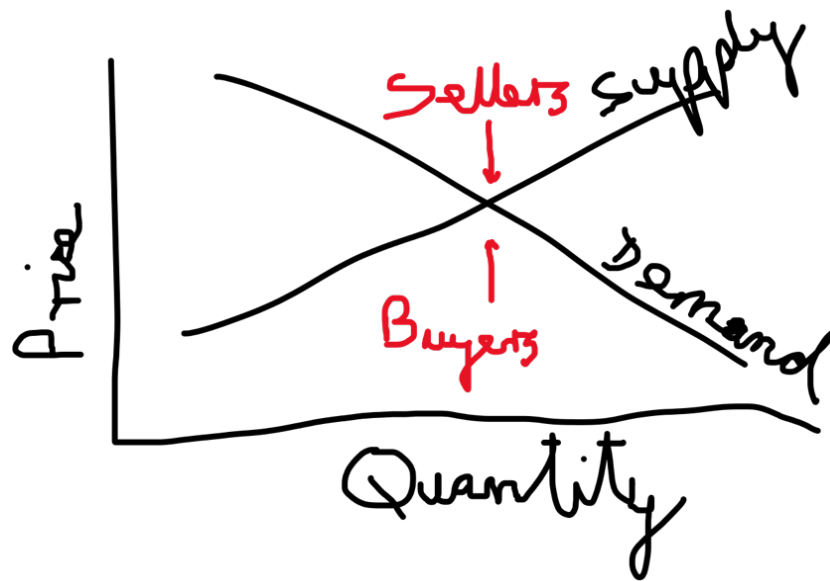
We may then follow Schumpeter in seeing the heart, or driver, of economic activity as the acquiring of products through exchange or production. And our confidence in holding those assumptions may be strengthened whenever we observe a transfer of products between a buyer and a seller.

Many theorists concur. Indeed, transfer of products is essential for describing the tendency of prices to reach equilibrium using supply and demand curves as drawn by Marshall⁷. In the following sketch, we can see that prices and quantities tend to reach equilibrium because the pressure of sellers competing with other sellers by *lowering* price (when supply exceeds demand) tends to counterbalance the pressure of buyers competing with other buyers by *raising* price (when supply is less than demand).

FIGURE 1 Supply tends to balance demand

⁶ Of course, pre-Copernican theory was not invalid. It simply took the earth as the reference point rather than the sun. Pre-Copernican was a somewhat useful theory for predicting observable sun rises especially in the short term. But a theory using the sun as the reference is more useful for explaining the relative paths of the sun and planets because the mathematics is easier. Similarly, resource-based theories are not invalid. They are somewhat useful for predicting observable exchanges of products especially in the short term, under simplifying conditions.

⁷ Alfred Marshall, *Principles of Economics*, 8th ed. (1920)



In addition, we can intuitively accept some important conclusions of neoclassical theory, such as: progress towards equilibrium will be *advanced* as traders increase their market knowledge of prices, or as the mobility of means of production increases within and across market boundaries; but will be *retarded* whenever there are unexpected changes in the market, or if some firms have a cost disadvantage due to the smaller scale of their production⁸.

Nevertheless, while those assumptions of economic theory may be suitable for static analyses of stable systems, they are not suitable for a longer-scale view of economic activity.

RE-EXAMINING THOSE ASSUMPTIONS

As mentioned, under present theory, people seek to acquire products because the resources that are combined to make them are thought to possess *value in use*, crucial for a person satisfying wants or instances of unmet needs. And people must struggle to compete because those resources are *scarce*.

Value in use

Since value in use is a cause that is nominated *after* its effects are observed, it is easy to see that neither the amount nor quality of value in use carried by a product can be determined in advance of each use⁹. This is the root of two difficulties in economic theory.

First, entrepreneurs are not able to intentionally invent novel products. Instead, when novelty arises from new combinations of resources this is assumed to arise by chance¹⁰.

⁸ For a background on neoclassical economists, see in particular Knight (1921), Arrow and Debreu (1954), and Stigler (1957):

- Knight, F. H. 1921. *Risk, Uncertainty, and Profit* (1st ed.). Boston, MA: Hart, Schaffner & Marx; Houghton Mifflin Co.
- Arrow, K. J., & Debreu, G. 1954. Existence of an Equilibrium for a Competitive Economy. *Econometrica*, 22(3): 265-290.
- Stigler, G. J. 1957. Perfect Competition, Historically Contemplated. *The Journal of Political Economy*, 65(1): 1-17.

⁹ Value in use is "indeterminate". Cournot, A. A. 1838. *Researches into the mathematical principles of the theory of wealth* (N. T. Bacon, Trans.). New York, London: The Macmillan Company. Page 10

Second, absolute quantity or quality of value in use cannot be included in static neoclassical mathematics for analysing equilibrium¹¹. How do economists exclude this crucial means to meeting unmet needs from mathematical analysis? This is easier than it may seem: one simply assumes the value has some arbitrary uniform level, so that it becomes invisible when cancelled out on both sides of the equation. Uniformity is achieved by assuming that copies of a product each possess the same value in use, measured in an absolute quality and number of units of benefit, even when used by different people. Moreover, each person's perception of that value, gained from experience, is assumed to be the same, whether the product is used or not. So, though value in use is the ingredient we seek when we acquire products, its value gets cancelled out in the equations, so that we don't need to know anything more about it.

Resource management assumptions not only support economic theory but also strategic management theory. Theorists in strategic management have a similar interest in 'value' added by firms. Because there is no mathematics for modelling equilibrium in strategic management, little thought was given to how to accommodate value in use until it was addressed in an academic debate culminating in 2001. When that debate settled it was agreed that value in use existed, but that it came from somewhere outside of the theoretical model, i.e. it was "exogenous to the resource-based theory"¹², which meant that when products were considered in the theory, they came replete with value in use, "by definition"¹³. One might even say, 'by *circular* definition'.

There is a sense in which the notion of 'value in use' is like two other notions that survived into the 18th and 19th centuries: phlogiston and miasma. In the positivist philosophy¹⁴ prevalent in those times, a natural rather than divine cause was sought for any observed outcome. But unfortunately, that natural cause was sometimes assigned by circular definition. This has been the case for all three of these indeterminate notions, which I suggest renders them no more than names given to supposed causes of the observed outcomes of, respectively, satisfied want, fire, and disease.

Resource scarcity

Many believe that we must compete for products because economic activity is limited by the inventory of resources that are combined to make them. However, this is contradicted by the information shown in Figure 2.

FIGURE 2
Growth in Population of Consumers

¹⁰ "... the indeterminacy of novelty ..." Schumpeter, Becker, and Knudsen. *Development*, Journal of Economic Literature, Vol. 43, No. 1 (March 2005), pp. 108-120. Page 118.

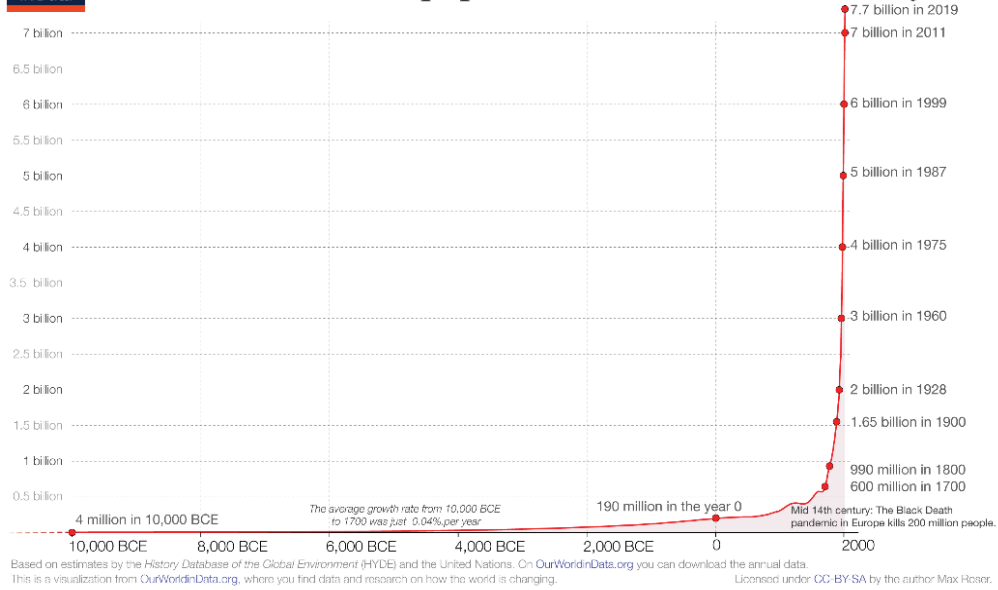
¹¹ Relative 'value in use' of subsequent copies of a product to an individual consumer is modelled in the mathematics as 'marginal utility', von Mises, *Human Action* (1949)

¹² Priem, R. L., & Butler, J. E. 2001. Tautology in the resource-based view and the implications of externally determined resource value: further comments. *Academy of Management Review*, 26(1): 57-66. Page 62

¹³ Teece, D. J. 2014. The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *The Academy of Management Perspectives*, 28(4): 328-352. Page 340

¹⁴ Following Kant (*The Critique of Practical Reason*, 1788), propositions can be categorised in one of four classes according to whether they are synthetic (real) or analytic (logical), which can be depicted along one axis; and on an orthogonal axis to whether they are formed *a posteriori*, from observed effects, or are predicted *a priori*. Viewed in a two-by-two-box frame formed by these axes, positivist philosophy began as a member of the strictly-empirical synthetic *a posteriori* class, and later included a logical approach that was a member of the analytic *a priori* class, this later approach often being termed logical positivism.

The size of the world population over the last 12,000 years



We can see that the Earth's human population was stable at an estimated four million for 4,000 years from 10,000 BC. Was the population size limited by resources over that period? Evidently not, because they lived in the presence of resources in the Earth's ecological system in quantities that would support a population of 7,700 million in 2019. Nor was population size limited by resources between the mid 1700s to the mid 1900s, during which the founding assumptions of resource-based economics were established¹⁵.

At any time during the development of present economic theory over the past few hundred years, an observer may well have concluded that short-term scarcity of products was due to a limit of the inventory of resources. But as we can see in retrospect, this was not the case, because the population continued to grow. Access to that inventory was enhanced during the industrial revolution, but the amount of the inventory itself was not the limit.

Though short-term scarcity certainly arose, when it did this was evidently due to something that was unrelated to the underlying inventory of resources¹⁶. Was that 'something' human labour? Adam Smith thought so. Smith's labour theory of (exchange) value was underpinned by his view that resource scarcity was due to the limited supply of commoditised human energy, or labour, expended to extract and combine those resources. But the supply of labour was not the limit for extracting and combining resources because even in Smith's time steam engines were already producing energy for extracting and combining resources, supplementing labour¹⁷.

¹⁵ Including ideas on population exceeding available food reflected by Malthus in his 'An Essay on the Principle of Population', in 1798

¹⁶ The notion of a resource limit is difficult to justify, because most living things are built from elements such as carbon, oxygen, hydrogen, nitrogen, and minerals, all of which are continually recycled, meaning they are not altered or used up, and are powered by the bountiful sun.

¹⁷ In the same way, 'labour' adopted in Marx's theory could also be replaced by steam engines.

Although resource scarcity may have appeared to be a valid concern at the time, in hindsight, we can see that the inventory of resources did not in fact limit economic activity or growth¹⁸.

Is there a more pressing limit to economic activity?

The fact that we did not exhaust physical resources or the energy required to extract and combine them over the past 300 and even the past 10,000 years is proof that neither the amount of those physical resources nor of that energy has limited economic activity or growth. So, there must have been some more-pressing limit, or we would indeed have reached those limits.

It seems indisputable that personal effort that can be wielded by each human has always been limited, both in rate and in sum over a lifetime. Although, of course, it does not follow that there is no yet more-pressing limit, I think it is fair to assume that, until one is identified, personal effort may be assumed to pose the effective limit for the economic outcome of meeting unmet needs.

Under this assumption, economics can be thought of as a study of the management of personal effort rather than of resources. This means we no longer have to rely on the rather mystical notion that resources or products possess value in use.

But is personal effort really any different from labour or power of people.

Personal effort is not the same either as labour or as 'power of people'. Labour is an economics concept, while 'power of people' is an observed factor of firm performance related to characteristics of individual people¹⁹. Both labour and 'power of people' rely on the notion of value in use: they are both resource-based concepts for energy expended by people to extract value-in-use possessing resources and combine them to produce products. They differ in degree of idiosyncrasy. Labour is simplified to a commodity that is indistinguishable from that supplied by other people, so that a labour theory of value (in-exchange) can be applied, and neoclassical equations can be solved. 'Power of people' is idiosyncratic, and to the present time theorists have not been able to assimilate it into neoclassical models.

In contrast, *personal effort*²⁰ is energy wielded by a person to meet instances of its own unmet needs, independently of value in use possessed by scarce resources. Because personal effort is wielded to meet one's own needs in an effort-management analysis, it is allowed to be idiosyncratic. People amplify their economic activity of meeting unmet needs when they invest personal effort in the present to increase their benefits per effort in the future, through production of tools and engines invented by themselves or by others²¹. Such investment can lead to a compounding of the amount of needs met per person per unit of time, because an

¹⁸ Julian Simon in his 1981 book *'The Ultimate Resource'*

¹⁹ Relevant to personnel and industrial economics. For example: Grund, C., Bryson, A., Dur, R., Harbring, C., Koch, A. K., & Lazear, E. P. (2017). Personnel economics: A research field comes of age. *German Journal of Human Resource Management*, 31(2), 101-107. Also: Ravi, M., Bhatia, M., Jain, V.K. (2023) Unlocking the power of people: Strategies for exceptional organizational leadership. *Galaxy International Interdisciplinary Research Journal*, 11(12), 1-28

²⁰ In its present scientific use, the term 'effort' is more accurately associated with force. However, 'effort' used here has the dimensions of energy, or work. By continuing to misuse the term I aim to maintain consistency with much economics literature such as Ferrerò's law of least effort.

²¹ A tool may be described as a device for leveraging personal effort, and an engine for converting other sources of energy to augment personal effort.

ever-greater proportion of effort may be devoted to meeting future unmet needs. This explains economic growth.

While the essence of resource-based concepts lies in their agency in extracting and combining value-in-use possessing resources to make value-in-use possessing products, the essence of personal effort lies in its agency in meeting instances of unmet needs of the person who wielded that effort.

AN EFFORT-MANAGEMENT THEORY FOR ECONOMIC BEHAVIOUR

If economic activity is not limited by the inventory of resources, we cannot justify the modelling of people as utility maximisers who drive the economic system when they compete to acquire products made from those resources. If, instead, economic activity is limited by the supply of personal effort, then people can be thought of as benefit-per-effort maximisers who drive the economic system when they wield effort in the present to maximise future benefits per effort.

An economic system for which activity is limited by personal effort may be termed an effort-management system. Selected terms used in resource management are compared with those used in effort management in the table below.

TABLE 1
Comparison between resource-management and effort-management economics

Term	Resource management meaning	Effort management meaning
Normative outcome	The greater good, through efficient allocation of scarce resources. Consistent with a utilitarian approach for population-wide benefit	Maximum benefit per effort for each person. Consistent with an individualist approach for population-wide benefit
Limit to the activity of meeting of unmet needs	Resources, defined as the source of value in use. Resources are made available through exertion of labour or other energy	Personal effort, defined as idiosyncratic human actions of any sort, including physical, or cerebral (such as for modelling reality or for inventing tools and engines)
Person	Utility maximiser who drives a resource-limited system by acquiring resources through production or exchange	Benefit-per-effort maximiser who drives an effort-limited system by wielding effort in the present to increase future benefit.
Value in use	A name given to the supposed cause of met needs; a quality of resources that is essential for meeting instances of unmet needs when used.	Not relevant
Labour	Commoditised human energy for extracting and combining resources to make products	Not relevant
Personal effort	Not relevant	Idiosyncratic human energy that can

Role of products	To carry value in use for meeting unmet needs	be used for meeting unmet needs a) To reduce personal effort required for meeting unmet needs b) To act as a path for interactions among the actions of different people in a complex system
Focal exchange	Reciprocal transfer of products between two people at a moment in time	Personal effort wielded in the present in the place of future effort wielded by the same person

At a primitive level of effort-management economic system, similar to that of a nest-making bird that makes a nest for its future use but not for use by others, a solitary benefit-per-effort maximising person may choose to wield its available effort on one day to invent and make a tool for digging tubers from the ground. On a later day, that tool may help to reduce effort needed per tuber, or to maximise tubers for available effort, or to make effort available for achieving different benefits.

Invention is allowed in such a system because a person is not inhibited by having to wait until after a resource has been used to determine its 'value in use'. This means that a person is free to design a solution to meet an objective. Also, personal effort is allowed to be idiosyncratic, because each person weighs the wielding of its effort in the present against its own anticipated future effort.

At a second level of economic system, similar to each member of a pair of birds, a person increases its benefit per effort through a division of tasks within a group such as a family. One member of a family may build a hut or hunt for food while another bears, nurtures, and rears children.

At a third level, an economic system may exhibit a property of organised complexity that emerges when the actions of many locally-acting free agents interact, though each agent alone does not exhibit that property.

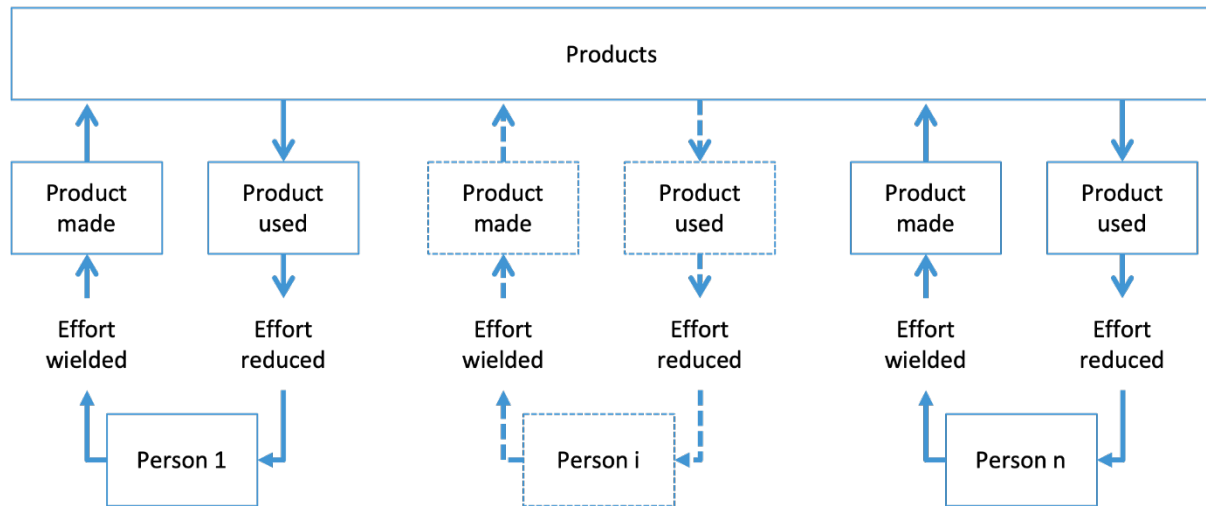
And at a fourth level, people concentrate on producing a particular product, often as part of a group²². At this level, each person further increases its benefits per effort by acting with others to reap economies of scale. A type of libertarianism can be reached that is consistent with 'National Libertarianism' if people are free to form groups of not just firms but nations in order to enhance benefit per effort²³. In contrast, the 'liberal' philosophy of Adam Smith emphasised goods transfer across boundaries in pursuit of efficient allocation of resources through free trade.

²² A 'group' of people can be any organisation for maximising benefit per effort, including a nation. For example, a group of people may periodically grant limited and temporary powers to an elected subset who serve under agreed principles and rules for the purpose of creating or abolishing products in the form of 'laws'. And this subset can be part of a governance framework of subsets that act independently to balance and control their powers. Such a framework could include, for example, an independent judiciary, an independent police force, and free journalists.

²³ Some commentators describe National Libertarianism as a composite of two ideas, liberty and nationalism, insofar as they both help to promote the outcome of liberty. Instead, I suggest liberty is an input and that individuals can enhance outcome of benefit per effort when they are free to form groups such as firms and nations.

Thus, an individual person who drives the system by wielding effort in the present to maximise its benefit may not only benefit itself but others too.

FIGURE 3
An effort-management perspective for interactions among people



People do indeed transfer products among members of the population, but the underlying driver of each transfer is the decision to wield available effort in the present to maximise that person's future benefit per effort.

In this system, a product may be used as a means to reduce effort for meeting particular instances of hitherto unmet need, and the focal exchange is not one of value-in-use-possessing products between people at a moment in time, but of personal effort between an individual person and the same person in the future. The role of products is to provide a path for interactions among agents that are required for an economy to behave as a complex system.

If a person decides to acquire a product made by another, that decision is based on a comparison between the effort needed to produce the same product and the effort to acquire the product in exchange for a different product.

MODELS

An economic system may be modelled as an open complex system given suitable assumptions. Three assumptions consistent with Libertarian philosophy are suggested:

1. Growth in economic activity is limited by supply of personal effort
2. Idiosyncratic individuals act independently²⁴ as benefit-per-effort maximising agents to drive the system by following the simple rule²⁵ of wielding effort in the present to maximise future benefit per effort;

²⁴ My purpose in drawing attention to the behaviour of an individual person is not the same as the purpose of neoclassical economists in reducing their analysis of an economic system to the level of Crusoe. Crusoe economics was used to show that competitive equilibrium was not solely a property of an overall neoclassical economic system, but was also a property of the economic activity of an atomistic component of such a system, a solitary person. In contrast, a complex system analysis can be used to show that organised complexity, emerging when the actions of many locally-acting free individual people interact, may be a property of an overall economic system but *not* also a property of the economic activity of each person. Nevertheless, in pointing away from atomism and towards a system of interacting free individuals, I have not

3. Interaction between the activities of agents is achieved through exchange of products
4. Agents are capable of acting together to achieve individual benefit. Forms of acting together include: within a group, division of labour; and among groups, specialisation of each group in particular product.

Evolution of an economic system may be modelled because of the idiosyncrasy allowed for each locally-acting person. Similar models are used in evolutionary theory in biology, for which such idiosyncrasy, or "variation among types", is required²⁶

More realistic models can be constructed if:

1. One of the benefits an individual may desire is benefit to another person
2. A degree of coercion (harm) is allowed. In this case, agents may appropriate the effort of others for making products or have their efforts appropriated by others. Degree and direction of appropriation may vary with characteristics such as empathy difference between appropriated and appropriator.

SUMMARY

Our present economic theory seems to draw from the same roots as some of our more general beliefs and behaviour. For example, two present assumptions of the inherent value of resources, and their scarcity, have led us to compete to maximise resources per person. We have sought to control those resources and to control or reduce the number of people and also other animals that are thought to use up the resources. We have used people as human labour for extracting, combining, or adding value to resources; we have enslaved the strong through chains or money. And more recently, some have seen humans as a burden on the planet and privately agree that while it may be unfortunate, the population simply must be reduced. Yet others aim to control survivors through notions of 'one health' and 'net zero carbon', supported by technologies for surveillance, centralised control, and the processing of big data.

The two assumptions are questionable, because value in use is indeterminate; and in hindsight we can see that the inventory of resources has not limited economic growth. To their credit, mathematicians who adopted those assumptions were able to build models for examining the equilibrium of stable systems. But those models do not enable analysis of more-realistic systems in which change may arise unexpectedly; they do not allow for novelty; and they do not allow for economic growth over time.

So, I suggest a more pressing limit to economic activity is personal effort, and based on this an 'effort-management' economic system can be devised. Such an economic system is driven by benefit-per-effort maximising individuals each wielding effort in the present to increase their own future benefits per effort.

gone so far as to assert a collectivist ontology in which the behaviour of individuals is determined by the system, which would leave "the human being the passive object of history", page 95 of Kanth, R. 1992. Economics and Epistemology: A Realist Critique. *Capital & Class*, 16(2): 93-112.

²⁵ Simple rules, such as those followed by individual ants in a model of a colony. Wilensky, U. & Rand, W. 2015. *Introduction to Agent-Based Modeling: Modeling Natural, Social and Engineered Complex Systems with NetLogo*. Cambridge, MA. MIT Press.

²⁶ Page 6 of Levin, S. A. 2002. Complex Adaptive Systems: Exploring the Known, The Unknown, and the Unknowable. *Bulletin (New Series) of the American Mathematical Society*, 40(1): 3-19.

Subject only to the usual duty imposed on each of us in a liberal democracy to do no harm, we humans may come to see our economics as an open complex system driven by the freely-wielded efforts of idiosyncratic individuals, from which the whole system benefits.

REFERENCES

- Arrow, K. J., & Debreu, G. 1954. Existence of an Equilibrium for a Competitive Economy. *Econometrica*, 22(3): 265-290.
- Cournot, A. A. 1838. *Researches into the mathematical principles of the theory of wealth* (N. T. Bacon, Trans.). New York, London: The Macmillan Company.
- Ferrero, G. 1894. L'Inertie Mentale et la Loi du Moindre Effort. *Revue Philosophique de la France et de l'Étranger*, 37: 169-182.
- Grund, C., Bryson, A., Dur, R., Harbring, C., Koch, A. K., & Lazear, E. P. (2017). Personnel economics: A research field comes of age. *German Journal of Human Resource Management*, 31(2), 101-107.
- Kant, I. 1788. *The Critique of Practical Reason*
- Kanth, R. 1992. Economics and Epistemology: A Realist Critique. *Capital & Class*, 16(2): 93-112.
- Knight, F. H. 1921. *Risk, Uncertainty, and Profit* (1st ed.). Boston, MA: Hart, Schaffner & Marx; Houghton Mifflin Co.
- Levin, S. A. 2002. Complex Adaptive Systems: Exploring the Known, The Unknown, and the Unknowable. *Bulletin (New Series) of the American Mathematical Society*, 40(1): 3-19.
- Malthus, T. 1798. *An Essay on the Principle of Population*
- Marshall, A. 1920. *Principles of Economics*, 8th ed.
- Marx, K. 1867. *Das Kapital*
- Priem, R. L., Butler, J. E. 2001. Tautology in the resource-based view and the implications of externally determined resource value: further comments. *Academy of Management Review*, 26(1): 57-66.
- Ravi, M., Bhatia, M., Jain, V.K. 2023. Unlocking the power of people: Strategies for exceptional organizational leadership. *Galaxy International Interdisciplinary Research Journal*, 11(12), 1-28
- Joseph Schumpeter, J. A. 1949. *The Theory of Economic Development*
- Schumpeter, J. A., Becker, M. A., & Knudsen, T. 2005. Development. *Journal of Economic Literature*, 43(1): 108-120.
- Simon, J. 1981. *The Ultimate Resource*
- Smith, A. 1776. *An Inquiry into the Nature and Causes of The Wealth of Nations*. Hazleton, PA 18202: PSU-Hazleton.
- Stigler, G. J. 1957. Perfect Competition, Historically Contemplated. *The Journal of Political Economy*, 65(1): 1-17.
- Teece, D. J. 2014. The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *The Academy of Management Perspectives*, 28(4): 328-352.
- von Bertalanffy, L. 1950. An Outline of General System Theory. *The British Journal for the Philosophy of Science*, 1(2): 134-165.
- von Mises, L. 1949. *Human Action. A Treatise on Economics* (1st ed.). Auburn, Alabama: Ludwig von Mises Institute.
- Weaver, W. 1948. Science and Complexity, *American Scientist*, Vol. 36: 536-544: Sigma Xi, The Scientific research Society.

Wilensky, U., Rand, W. (2015). *Introduction to Agent-Based Modeling: Modeling Natural, Social and Engineered Complex Systems with NetLogo*. Cambridge, MA. MIT Press.