

Sensory Order and Economic Order

The links between human cognition and
economic freedom in Hayek's thought

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CIS Occasional Paper 101



2005

Published January 2006
by The Centre for Independent Studies Limited
PO Box 92, St Leonards, NSW, 1590
Email: cis@cis.org.au
Website: www.cis.org.au

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National Library of Australia
Cataloguing-in-Publication Data:

Novak, Julie.

Sensory order and economic order : the links between human cognition and economic freedom in Hayek's thought.

ISBN 1 86432 106 7.

1. Hayek, Friedrich A. von (Friedrich August), 1899- . Sensory order. 2. Economics - Psychological aspects. 3. Cognitive psychology. I. Centre for Independent Studies (Australia). II. Title. (Series : CIS occasional papers ; 101).

330.1

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Typeset byCarolynn Chen
Typeset in AGaramond 11pt

Acknowledgements

The author would like to thank two anonymous referees for providing helpful comments on a previous draft of this paper, and Professor John Foster (University of Queensland) and Professor Leland B Yeager (Auburn University) for providing references which have been used in the preparation of this paper. The author also wishes to thank Andrew Norton for providing editorial comments on a draft version of this paper. The author assumes responsibility for all remaining errors.

Sensory Order and Economic Order

Introduction

Friedrich August von Hayek (1899-1992), the winner of the 1974 Nobel Memorial Prize in Economic Science, was the 20th century's most resolute defender of classical liberal thought. His major contributions are *The Road to Serfdom* (1944), *Individualism and Economic Order* (1948), *The Constitution of Liberty* (1960), *Law, Legislation and Liberty* (1973-1979), and *The Fatal Conceit: The Errors of Socialism* (1988). Hayek's legacy covers economics, social and political philosophy, jurisprudence, epistemology, logic, history, ethics, and anthropology. In no small part, the continuing interest in his life work reflects Hayek's efforts to demonstrate a free society's power to enhance human well-being and his incisive dismemberment of socialism's theoretical foundations.

While Friedrich Hayek's name will forever remain associated with economics, his original scholarly interest was cognitive psychology.¹ In 1920, at the age of 21, when Hayek was a student at the University of Vienna, he wrote an essay on cognitive psychology entitled 'Beiträge zur Theorie der Entwicklung des Bewusstseins' ('Contributions to the Theory of the Development of Consciousness'). This essay, which Hayek in the late 1940s described as 'the most important thing' he had ever accomplished intellectually,² subsequently formed the basis of his 1952 book *The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology*. It foreshadows later developments in psychology, neurology, and artificial intelligence research. However,

few economists have attempted to understand Hayek's psychological writing in any great detail. Many commentators seemingly regard this work as something of an oddity in the context of his broader writings on economic, legal, social and political issues.

This paper illustrates the connection between *The Sensory Order* and Hayek's economic thought which in turn provides a defence of the competitive market order (as underpinned by a capitalistic economic constitution). The first section summarises Hayek's theory of the mind, emphasising its role in the 'classification' (that is, ordering and retaining) of sensory impulses from the outside world. The following section describes how these theoretical insights relate to accounts of human behaviour within the dynamic, evolutionary market economy. Then, drawing on Hayek's politico-legal theory, as well as later developments in *ordo*-liberalism and constitutional economics, it argues that broad institutional rules are critical to channelling the multitude of individual 'sensory orders' towards innovative and productive economic action, which benefits economic agents and enhances the 'wealth of nations'. In conclusion, it submits that arguments for economic freedom and competitive markets are substantially enriched by a greater appreciation of Friedrich Hayek's efforts in the domain of cognitive psychology.

The mind as a 'sensory order': A summary of Hayek's cognitive psychology

What is the 'mind'?

As noted above, Friedrich Hayek's *The Sensory Order* represented the culmination of preliminary work undertaken some 30 years earlier. In essence, the *The Sensory Order* sought to explain the interaction between the mental realm (or, in Hayek's words, the 'microcosmos') and the physical realm of our external environment (the 'macrocosmos'). By drawing out the distinctions between the two, Hayek was able to explain the sensory properties of the mind as a distinct facet of existence.

So, what is Hayek's concept of the 'mind'? According to *The Sensory Order*, the mind 'orders' perceptions through acts of interpretation or, in Hayek's own words, it refers to '... a particular

order of a set of events taking place in some organism and in some manner related to, but not identical with, the physical order of events in the environment'.³ Human beings make the world around them intelligible by comparing their sensory perceptions received from the environment to the 'classes' of earlier perceptions stored in the memory. By connecting new sensory information to previous sensory experiences, and thus continuously generating knowledge of an ever greater degree of complexity, the interconnected network of linked sensory experiences in the mind is referred to by Hayek as the 'sensory order'.

The evolutionary, adaptive properties of the sensory order

In *The Sensory Order* Hayek provided a rigorous explanation of the mind as a self-organising (spontaneous) complex sensory order. The mind takes sensory information as input, transforms it in various ways, stores it, analyses it, integrates it, applies decision rules to it, and then translates these decisions into actions. The mind in Hayek's theory has essentially four interconnected key properties:⁴

- *The mind is self-referential:* The mind combines sensory data in a network of connections: '... what we know at any moment about the external world ... is determined by the order of the apparatus of classification which has been built up by pre-sensory linkages'.⁵ Each sensory event is 'path-dependent' because it is conditioned by an individual's prior experiences.
- *The mind is evolutionary:* The mind's neural connections are affected not only by an individual's lifetime experiences, but also by 'hard-wired' sensory perceptions which are the result of human genetic evolution. With each additional sensory experience the sensory order evolves with greater complexity. In some cases, the sensory order might require fundamental changes to incorporate a new sense impulse, or group of impulses, that have not been experienced previously.⁶ The mental linkages that develop are adaptive—strengthened if they lead to correct predictions about the external environment, and weakened if they no longer work. Hayek's account explains the possibility of learning, imagination

and creativity by an individual, such that ‘... the microcosm in the brain progressively approximates to a reproduction of the macrocosm of the external world’.⁷

- *The mind as abstraction:* The sensory order provides a filtered (classified) collection of similarities and types of incomplete representations of the world. Therefore, ‘... *all* we know about the world is of the nature of theories and all ‘experience’ can do is to change these theories’.⁸ Since we do not know the world in all its finer details, retaining only abstract summaries of it, there may be instances where we misinterpret the stimuli we receive—leading to a trial-and-error process of reclassifying sensory information. Our interpretation of the world is adjusted, sometimes radically, to ensure a more accurate representation of reality and, hence, a better fit to the complex environment.
- *The mind is unknowable to the conscious self:* The number and complexity of relations between the sensory order’s different qualities is so great that we can never exhaustively describe it on an empirical basis. As Hayek noted, ‘... any apparatus of classification must possess a structure of a higher degree of complexity than is possessed by the objects which it classifies; and ... therefore, the capacity of any explaining agent must be limited to objects with a structure possessing a degree of complexity lower than its own’.⁹ Therefore, the mind’s full activities and insights are beyond the scope of self-conscious introspection and analysis, hidden to ourselves and from others.

In summary, the theory of the mind expounded in *The Sensory Order* suggests that human perception depends upon a classification system, which screens sensory information from the external environment into an abstract representation of reality. Under Hayek’s model of the mind, the ‘... possibilities of classification of ... the different individual impulses and groups of impulses ... are practically unlimited’,¹⁰ thus leading to the complex self-organising system that he calls the sensory order. The ordering capacities of the mind then guide actions that promote the individual’s adaptation

to the environment. Hayek's cognitive psychology promotes an evolutionary account of how an individual, despite ignorance, is nonetheless able to construct theories of reality, and to adapt and prosper through continuous, and often dramatic, change in their physical and human environments.

**Cognition and freedom of human action:
The market as an evolutionary system**

On economic coordination as a 'knowledge problem'

Friedrich Hayek sees the economy as a complex, evolutionary self-organising system in which individuals interact with each other to produce, exchange and consume resources. In *The Sensory Order's* parlance, individual economic action is a process of continuously ordering the external environment by an agent so as to maintain a flow of resources to that agent.¹¹ However, individual knowledge is subjective and dispersed. The defining issues for an evolutionary account of economics surround how we know what other people know and intend to do, and how we can align relevant pieces of individual knowledge. Hayek specified the 'knowledge problem' as how to secure the subjectively best use of dispersed resources, given the tacit 'knowledge of circumstances of time and place', known to some individuals but not available in its totality, even in principle, to any individual or central authority.¹² In his own words, '... How can the combination of fragments of knowledge existing in different minds bring about results which, if they to be brought about deliberately, would require a knowledge on the part of the directing mind which no single person can possess?'¹³

It is in this context that Hayek promotes the competitive market. The marketplace distils the knowledge necessary for economic functioning. In a market environment, individuals plan their actions based on their local knowledge, and revise their plans in light of new knowledge (including what others may intend to do). By delegating both definitional problems (such as what resources can be regarded as commodities, how different commodities may be obtained and used, and possibilities for future economic action) and calculational problems (which uses price and profit signals to superimpose

outputs simplify transactions by spreading knowledge to consumers about the underlying commodity values and production costs. In particular, prices communicate new knowledge, albeit in coded form, to others, expressing also the valuations of other participants in the economic process.¹⁵

At a broad level, producers may ‘replicate’ those goods and services that have previously attracted sufficient buyers, or engage in ‘product/process variation’, modifying existing products or creating new outputs.¹⁶ Those producers who make the best hypotheses about satisfying demand gain a competitive advantage in the market, and hence profit in comparison with their competitors. On the other hand, firms that do not attract sufficient market share for their goods or services are likely to have low profits (or outright losses). This is knowledge generated by the market process, a signal to eliminate errors and to either copy their competitors or to generate superior new products or processes.

In a dynamic, specialised economy the knowledge discovery and testing process is not cost-free. For example, given individuals’ cognitive limitations and the divided nature of knowledge, the market process can entail high ‘transaction costs’. These include search and information costs (for example, costs incurred in determining that the required goods and services are available on the market, who offers the lowest prices, and so on), bargaining costs (for example, costs required to arrive at an acceptable agreement with the other party of a transaction, drawing up an appropriate contract, and so on), and enforcement costs (for example, costs of ensuring that the other party adheres to the terms of a contract, and taking appropriate action upon breaches of contract).

Since consumers are keen to reduce these costs, and the associated risks, producers have incentives to minimise these expenses for potential customers, through strategies such as advertising, establishing a market reputation as a quality supplier, or providing financial assistance/after-sales services such as warranties or ‘money-back’ guarantees.¹⁷ Establishing open-ended, long-term relationships between suppliers and customers, or the establishment of specific intermediary agents, may help limit transaction and

coordination costs in the market. As will be discussed later, another method to economise on transaction costs is for economic agents to agree on set rules (called ‘institutions’) pertaining to the nature of market conduct.

Consumers are integral to the effective functioning of evolutionary competitive markets. Intending purchasers of goods and services compete amongst themselves, and incur transaction and other costs in the process, to obtain good relevant knowledge of where and what to buy, from whom, and how to obtain advantageous exchanges with potential sellers. Consumers also generate variety, through using products and services to solve problems (even in combinations that no producer has imagined previously).¹⁸ By expressing with their buying decisions which goods and services they prefer, at various anticipated price levels, consumers either confirm or refute producers’ hypotheses. According to Vanberg and Kerber, ‘... they are the ultimate judges in this contest, and hence can be understood as the “reality,” against which these hypotheses are tested’.¹⁹

The market as an evolutionary system populated by individual ‘sensory orders’

Hayek also recognised the centrality of human cognition in the overall development of the competitive market system described above. Economic evolution reflects the underlying actions and reactions of individual producing, exchanging and consuming ‘sensory orders’ embedded in individual minds, which in turn hold diverse and fragmentary elements and structures of knowledge about resource allocation and mobilisation problems.²⁰ Individuals engage in the market process to learn about what they want, what others want, and what opportunities are available: ‘... which goods are scarce goods, or which things are goods, and how scarce or valuable they are—these are precisely the things which competition has to discover’.²¹ Producers and consumers are intertwined in a complex evolutionary connective web of voluntary exchange which enhances their mutual understandings of the ‘macrocosm’ of the economy, and thus improves the accuracy and detail of their internal economic ‘mental maps’. It is through this never-ending process

of spontaneously ordered competition that the ‘sensory orders’ of buyers and sellers engage with each other and coordinate to resolve complex economic problems and, through it, create the foundations of wealth creation and economic prosperity.²²

The reason of rules: The role of the capitalist economic constitution in facilitating economic cognition and safeguarding freedom

The role of rules in guiding human cognition in complex economic environments

According to Hayek’s theory of the mind, the world around us is conjectural, using a pre-existing system of classification to interpret events. By extension, the market provides an institutional arena where individual agents propose and implement, through producing and providing a complex array of goods and services, alternative economic hypotheses, subject to the approval or rejection of consumers. Hayek persuasively argued that market arrangements are desirable since they ‘... secure for any random member ... a better chance over a wide range of opportunities available to all than any rival system could offer’,²³ and this is in no small measure due to the fact that markets provide individuals with the freedom to employ the unique economic knowledge classified in their mind.²⁴

However, for market competition to produce the desired results it has to be constrained and shaped by appropriate ‘rules of the game’. It needs a framework guiding market participants’ competitive efforts in directions which are beneficial to economic agents and to overall wealth creation. Appropriate institutional rules reduce the costs of transacting business with other individuals by facilitating predictability about the workings of a complex economic environment. These rules make it easier for individuals to interact in a complex, changing world, reducing the prospect of ‘cognitive overload’ in the face of ever-present knowledge problems. They also help resolve conflicts between people, and protect individual freedom.

These economic rules help individual ‘sensory orders’ form more reasonable (even if imperfect) expectations of the economic environment around them, and inform the knowledge creation and

dissemination potential of the market. As noted by Hayek, rules are ‘... a device we have learned to use because our reason is insufficient to master the full detail of complex reality’,²⁵ and from an evolutionary economics perspective, they represent ‘building blocks’ that produce or effect operations within the competitive market order.

The economic constitution:

The underlying market rules of ordo-liberalism

What economic rules are likely to ensure that the market allows agents to propose and test their economic mental conjectures in a cost-effective and orderly fashion? During the 1930s and 1940s, a number of German scholars, including Walter Eucken, Franz Böhm and Wilhelm Röpke (and, especially during the 1960s, Friedrich Hayek himself)—collectively known as the *ordo*-liberal theorists—wrote about the importance of a stable and transparent framework of rules for efficient private market functioning. The institutional framework of the market should direct competitors in certain directions (such as price and non-price competition), and discourage activities in others (such as cartels, violence, coercion or fraud against other competitors and/or consumers).²⁶ Furthermore, if markets are to create, structure and transmit knowledge and enhance overall economic prosperity, then the ‘economic constitution’ must be one ‘... that provides room for human creativity and innovativeness, a framework in which individuals—separately or collectively—can explore and find new and better solutions to “old” problems, as well as discover and try out solutions to “new” problems’.²⁷ Hayek endorsed such views when he suggested that the fundamental principle of economic liberalism should be grounded in ‘... a policy which deliberately adopts competition, the market, and prices as its ordering principles’.²⁸

Drawing on historical precedents for the institutional framework that best supports competitive markets, and on the lessons of the economic failures of the cartel-ridden German Weimar Republic and Nazi Germany, the *ordo*-liberals considered that the preconditions (or ‘constitutive principles’) for the maintenance of market-based economic evolution include:

- **Monetary stability**, retaining the value of money and isolating changes in its value from political influence, ensuring that inflation does not distort the allocative and knowledge-transmission functions of the price mechanism.
- **Open markets**, particularly the absence of public and private market barriers in domestic and international trade.
- **Private property and ownership of the means of production**, ensuring continued flexibility and incentives to trade and invest within a decentralised market process.
- **Freedom of contract** between autonomous economic agents. Restrictive contracts and agreements which close off markets and curtail the freedom of others are not permitted.
- **Complete liability** for one's commitments and actions, ensuring that losses and bankruptcies in the marketplace are not shifted to other agents.
- **Consistency of economic policy**, where predictable and reliable governmental policies give market agents confidence to invest and make decisions.²⁹

The *ordo*-liberals argued that these elements of an economic constitution would allow individuals, within these limits, to follow the economic values and preferences generated by their own 'sensory orders', whilst ensuring that the market environment is maintained and protected against coercive activities that subvert the competitive process.

The role of government in upholding the economic constitution, and the dangers of central planning

While the *ordo*-liberals demanded that governments play the role of impartial 'referee', providing the transparent and consistent rule of economic order, they also realised that there is a significant risk that government will seek to intervene directly in the economy to achieve social justice or self-serving political objectives. In other words, the government has a temptation to act as a 'lion in the path' of free market exchange, with a set of proscriptive regulations, special-interest

subsidies and the like, in an effort to shift individual economic behaviour in line with their plans and objectives. This problem was outlined by Hayek when he suggested that ‘... Governments strong enough to protect individuals against the violence of their fellows make possible the evolution of an increasingly complex order of spontaneous and voluntary cooperation. Sooner or later, however, they tend to abuse that power and to suppress the freedom they had earlier secured in order to enforce their own presumably greater wisdom and not to allow “social institutions to develop in a haphazard manner”.’³⁰

Hayek famously integrated evolutionary and psychological insights to show that atavistic attitudes, commonplace in small tribes and groupings of early human existence, are remnant in modern societies, and that this in turn drives sentiments in favour of socialistic government policies which hamper the workings of the complex spontaneous market order. More specifically, this is underpinned by a tension between who we are based on what we have inherited from the evolutionary environment of our ancestors, and the demands upon us created by the world since the ‘agricultural revolution’ around 10,000 years ago.³¹ According to Hayek,

... [p]art of our present difficulty is that we must constantly adjust our lives, our thoughts and our emotions, in order to live simultaneously within different kinds of orders according to different rules. If we were to apply the unmodified, uncurbed rules (a caring intervention to do visible good) ... of the small band or troop, or of, say, our families to ... our wider civilisation (the extended order of the market), as our instincts ... often make us wish to do, *we would destroy it*. Yet if we were always to apply the rules of the extended order (action in the self-interest within competitive markets) to our more intimate groupings, *we would crush them*. So we must learn to live in two sorts of world at once.³² In other words, ‘... [s]ocialists have the support of inherited instincts, while maintenance of the new wealth ... requires an acquired discipline.’³³

Hayek had persuasively argued over many years that not only is political ‘top-down’ planning an affront to individual liberty and economic freedom, but, because the mind cannot fully know itself or the multitude of other minds interfacing within the market, government agents cannot consciously direct an economy consistent with the prior instructions and expectations of the intended central plan: ‘... no single human intelligence is capable of inventing the most appropriate abstract rules because those rules which have evolved in the process of the growth of society embody the experience of many more trials and errors than any individual mind could acquire’.³⁴ The failure of central planning was seen by Hayek as a clear case of the more generalised ‘knowledge problem’, since cognitive limitations restrict an external agent’s understanding of the structure and the contents of the minds of those being planned.³⁵

Therefore, a competitive market order, which promotes economic freedom and ‘bottom-up’ wealth creation, requires abstract, general rules that drive greater compatibility between the cognitive theories of individuals in a market economy environment. This renders the evolutionary process of economic action and response more predictable. At the same time, the scope of discretionary political power needs to be constrained, guaranteeing that the free market process is not distorted by the pursuit of political objectives and thus ensuring the maintenance of an economic climate conducive to private production, exchange and consumption activities.

Conclusion

Friedrich Hayek’s *The Sensory Order* should not only be recognised as a tract in the realm of cognitive psychology, but also as a work which provides some critical underpinning arguments for economic freedom, the rule of law and limits to government power. Indeed, Hayek’s psychological theories had a pivotal place in his research agenda, which focused on how human beings acquire and communicate the subjective knowledge of the world that allows them to operate within different physical and human (including economic) environments--and to cooperate and coordinate their actions with other agents who are equally limited in their

understanding of the complex world around them.³⁶ Further, the lessons of *The Sensory Order* support the evolutionary development of economic rule-systems that reduce transaction and coordination costs and smooth the problems associated with cognitive limitations about complex markets. Finally, *The Sensory Order* shows how public sector interventionism, in an effort to change the course of specific economic outcomes, reflects attempts to interfere with individual cognitive processes, and must ultimately be consigned to failure due to the prevalence of the ‘knowledge problem’.

The originality and consistency of Hayek’s work is reflected in powerful statements made in his last book, *The Fatal Conceit*, in which he embeds the spontaneous order of the human mind in economic and social orders of even greater degrees of complexity. To quote at length:

Our civilisation depends, not only for its origin, but also for its preservation, on what can be precisely described only as the extended order of human cooperation, an order more commonly, if somewhat misleadingly, known as capitalism. ... The extended order is probably the most complex structure in the universe—a structure in which biological organisms that are already highly complex have acquired the capacity to learn, to assimilate, parts of suprapersonal traditions enabling them to adapt themselves from moment to moment into an ever-changing structure possessing an order of a still higher level of complexity.

The fact that certain structures can form and multiply because other similar structures that already exist can transmit their properties to others (subject to occasional variations), and that abstract orders can thus undergo a process of evolution in the course of which they pass from one material embodiment into others that will arise only because the pattern already exists, has given our world a new dimension: time’s arrow. In the course of time new features arise which did not exist before: self-perpetuating and evolving structures which, though represented at any one moment only by particular

material embodiments, become distinct entities that in various manifestations persist through time.

The possibility of forming structures by a process of replication gives those elements that have the capacity for doing so better chances of multiplying. Those elements will be preferably selected for multiplication that are capable of forming into more complex structures, and the increase of their members will lead to the formation of still more such structures. Such a model, once it has appeared, becomes as definite a constituent of the order of the world as any material object. In the structures of interaction, the patterns of activities of groups are determined by practices transmitted by individuals of one generation to those of the next; and these orders preserve their general character only by constant change (adaptation).³⁷

By arguing that the evolutionary market, underpinned by the rule-institutions of limited government, is most compatible with the nature and growth of economic knowledge, and thus fits best with the sensory order of human minds, Hayek's *The Sensory Order* represents a key work in classical liberalism and serves as a permanent reminder of his genius.

Endnotes

- ¹ Cognitive psychology is a branch of psychological science that studies aspects of cognition (the mental processes that underlie human behaviour). This incorporates a broad range of research domains including memory, attention, perception, knowledge representation, reasoning, creativity, and problem solving.
- ² Remark made in a private letter by Hayek to John Nef, dated 6 November 1948. See G. R. Steele, 'Hayek's *Sensory Order*', *Theory and Psychology* 12:3 (2000), 125-147.
- ³ Friedrich August Hayek, *The Sensory Order: An inquiry into the Foundations of Theoretical Psychology* (London: Routledge and Kegan Paul, 1952), 16.
- ⁴ Gary T. Dempsey, 'Hayek's *Terra Incognita* of the Mind', *The Southern Journal of Philosophy* 34, 13-41.
- ⁵ Friedrich August Hayek, *The Sensory Order*, 167.
- ⁶ In Hayek's terminology, the classification scheme of the mind provides a semi-permanent 'map' of the world, which changes gradually via the constant exposure of the mind to every new stimulatory experience. Whenever a new experience is inconsistent with the incumbent mental map (that is, where knowledge becomes redundant), the system of classification is duly revised.
- ⁷ Friedrich August Hayek, *The Sensory Order*, 108.
- ⁸ Friedrich August Hayek, *The Sensory Order*, 143.
- ⁹ Friedrich August Hayek, *The Sensory Order*, 185.
- ¹⁰ Friedrich August Hayek, *The Sensory Order*, 71.
- ¹¹ In this context, resources are not so much scarce but semi-stable—they are sometimes bountiful, sometimes scarce, sometimes non-existent, but always uncertain—which adds to the inherent complexity associated with economic coordination. Drawing on evolutionary psychology, with the mind conceived as a complex and massively modular system of subroutines, or 'modules' that is an adaptation to a recurrent problem in the ancestral environment, humans have become cognitively adapted to live in an economic environment associated with resource flows locked in a constant state of flux. See Jason Potts, 'Toward an Evolutionary Theory of *Homo oeconomicus*: The Concept of Universal Nomadism', in *Evolutionary Economics and Human Nature*, ed. John Laurent (Cheltenham: Edward Elgar, 2003).
- ¹² Hayek's ideas regarding the nature and use of knowledge were also central to his critique of socialism and government planning.

- ¹³ Friedrich August Hayek, 'Economics and Knowledge' (1936), in *Individualism and Economic Order* (Chicago: University of Chicago Press, 1948), 54.
- ¹⁴ Friedrich August Hayek, 'The Pretence of Knowledge' (1974), in *New Studies in Philosophy, Politics, Economics and the History of Ideas* (Chicago: University of Chicago Press, 1978), 27.
- ¹⁵ Wolfgang Kasper and Manfred E. Streit, *Institutional Economics: Social Order and Public Policy* (Cheltenham: Edward Elgar, 1998).
- ¹⁶ The variation element of competition is driven by fundamental changes in commodity types, technology, sources of supply, forms of organisation, and so forth, and is commonly known as 'creative destruction.' See Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (London: Allen & Unwin, 1954), 84, and Jason Potts, 'Evolutionary Economics: Foundation of Liberal Economic Philosophy', *Policy* 19:1 (Autumn 2003), 58-62.
- ¹⁷ Wolfgang Kasper and Manfred E. Streit, *Institutional Economics*; Brian J. Loasby, *Knowledge, Institutions and Evolution in Economics* (London: Routledge, 1999); Brian J. Loasby, 'Market institutions and economic evolution', *Journal of Evolutionary Economics* 11 (2000), 297-309.
- ¹⁸ Brian J. Loasby, 'Market institutions and economic evolution.'
- ¹⁹ Viktor Vanberg and Wolfgang Kerber, 'Institutional Competition among Jurisdictions: An Evolutionary Approach', *Constitutional Political Economy* 5, 193-219.
- ²⁰ Gary T. Dempsey, 'Hayek's *Terra Incognita* of the Mind'; Steven Horwitz, 'From *The Sensory Order* to the Liberal Order: Hayek's Non-rationalist Liberalism', *Review of Austrian Economics* 13 (2000), 23-40.
- ²¹ Friedrich August Hayek, 'Competition as a Discovery Procedure' (1968), in *New Studies in Philosophy, Politics, Economics and the History of Ideas* (Chicago: University of Chicago Press, 1978).
- ²² From an evolutionary economics perspective, the emergent market properties permit the development of even more complex and specialised methods of economic production, exchange and consumption over time. Indeed, economic systems are based upon many layers of complex systems where agents not only acquire knowledge in the course of their actions and operations, but that part of the knowledge they acquire is about the internal states of other economic agents. See John Foster, 'From Simplistic to Complex Systems in Economics', University of Queensland Department of Economics Discussion Paper No. 335 (2004).

- ²³ Friedrich August Hayek, *The Fatal Conceit: The Errors of Socialism*, ed. W. W. Bartley (Chicago: University of Chicago Press, 1988), 85.
- ²⁴ Martti Vihanto, 'Using Psychology to Reinforce the Austrian Argument for Freedom: The Case of Loan Decisions', *Constitutional Political Economy* 9:4 (1998), 303-321.
- ²⁵ Friedrich August Hayek, *The Constitution of Liberty* (London: Routledge and Kegan Paul, 1960), 66.
- ²⁶ Viktor Vanberg, 'Hayek's Legacy and the Future of Liberal Thought: Rational Liberalism versus Evolutionary Agnosticism', *The Cato Journal* 14:2 (Fall 1994), 179-199.
- ²⁷ James M. Buchanan and Viktor J. Vanberg, 'Constitutional Implications of Radical Subjectivism', *Review of Austrian Economics* 15:2/3 (2002), 121-129.
- ²⁸ Friedrich August Hayek, "'Free Enterprise and Competitive Order' (1947), in *Individualism and Economic Order* (Chicago: University of Chicago Press, 1948), 110.
- ²⁹ Wolfgang Kasper and Manfred E. Streit, *Lessons from the Freiburg School: The Institutional Foundations of Freedom and Prosperity*, Occasional Paper No. 44 (St. Leonards: The Centre for Independent Studies, 1993)
- ³⁰ Friedrich August Hayek, *The Fatal Conceit*, 32.
- ³¹ Leda Cosmides and John Tooby, 'Better than Rational: Evolutionary Psychology and the Invisible Hand', *American Economic Review* 84:2 (May 1994), 327-332; Vernon L. Smith, 'Experimental Methods of (Neuro)Economics', George Mason University Interdisciplinary Center for Economic Science Working Paper (June 2001).
- ³² Friedrich August Hayek, *The Fatal Conceit*, 18.
- ³³ Friedrich August Hayek, 'The Atavism of Social Justice' (1976), in *New Studies in Philosophy, Politics, Economics and the History of Ideas* (Chicago: University of Chicago Press, 1978), 67.
- ³⁴ Friedrich August Hayek, 'Kinds of Rationalism' (1964), in *Studies in Philosophy, Politics and Sociology* (Chicago: University of Chicago Press, 1967), 88.
- ³⁵ Gary T. Dempsey, 'Hayek's *Terra Incognita* of the Mind'; also Leland B. Yeager, 'Hayek on the Psychology of Socialism and Freedom', *AEI Economist* (November 1984), 1-5.
- ³⁶ Viktor J. Vanberg, 'Austrian Economics, Evolutionary Psychology and Methodological Dualism: Subjectivism Reconsidered', University of Freiburg Walter Eucken Institut Freiburg Discussion Papers on Constitutional Economics No. 04/3 (2003).
- ³⁷ Friedrich August Hayek, *The Fatal Conceit*, 6, 127, 151.



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