

## *Coordination* in the History of Economics

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*Abstract:* We tell of the evolving meaning of the term *coordination* as used by economists. The paper is based on systematic electronic searches (on “coord,” etc.) of major works and leading journals. The term *coordination* first emerged in professional economics around 1880, to describe the directed productive concatenation of factors or activities within a firm. Also, transportation economists used the term to describe the concatenation of routes and trips of a transportation system. These usages represent what we term *concatenate coordination*. The next major development came in the 1930s from several LSE economists (Hayek, Plant, Hutt, and Coase), who extended that concept beyond the eye of any actual coordinator. That is, they wrote of the concatenate coordination of a system of polycentric or spontaneous activities. These various applications of concatenate coordination prevailed until the next major development, namely, Thomas Schelling and game models. Here coordination referred to a mutual meshing of actions. Game theorists developed crisp ideas of coordination games (like “battle of the sexes”), coordination equilibria, convention, and path dependence. This “coordination” was not a refashioning, but rather a distinct concept, one we distinguish as *mutual coordination*. As game models became more familiar to economists, it was mutual coordination that economists increasingly had in mind when they spoke of “coordination.” Economists switched, so to speak, to a new semantic equilibrium. Now, mutual coordination overshadows the older notion of concatenate coordination, although “Austrian” economists have sustained discussion of concatenate coordination (with unfortunate confusion, we suggest). The two senses of *coordination* are conceptually distinct and correspond neatly to the two dictionary definitions of the verb *to coordinate*. Both are crucial to economics. We suggest that distinguishing between the two senses can help to clarify “coordination” talk. Also, compared to talk of “efficiency” and “optimality,” concatenate coordination allows for a richer, more humanistic, and more openly aesthetic discussion of social affairs. The narrative is backed up by Excel worksheets that report on systematic content searches of the writings of economics using the worldwide web and, using *JSTOR*, of *Quarterly Journal of Economics*, *Economic Journal*, *Journal of Political Economy*, *American Economic Review*, and *Economica*.

**Keywords:** coordination, concatenation, planning, coordination equilibrium, focal point

**JEL codes:** A10, B00, C7, D2

*Acknowledgements:* We thank Niclas Berggren, Andreas Bergh, Gene Callahan, Nils Karlsson, Peter Leeson, Henrik Lindberg, and Alex Tabarrok for useful comments.

Excel file URL:

[http://www2.sofi.su.se/~lst/docs/Klein-Orsborn\\_Coordination\\_in\\_HET2.xls](http://www2.sofi.su.se/~lst/docs/Klein-Orsborn_Coordination_in_HET2.xls)

## *Coordination* in the History of Economics

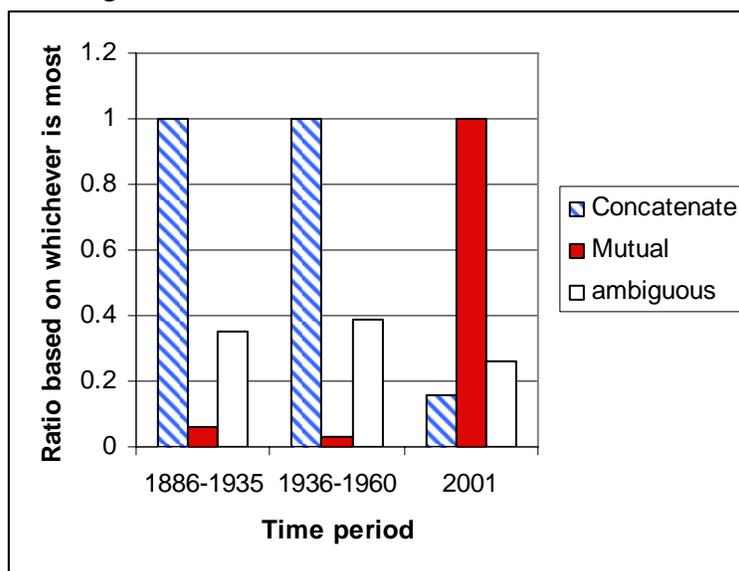
Coordination has been said to be *the* economic problem that needs to be explained (Knight 1951; 6; Leijonhufvud 1981, 321-322). But what does *coordination* mean? Although he never used the term *coordination*, Adam Smith nonetheless addressed one form of coordination when he described the concatenation of activities producing a woolen coat (Smith 1976 [1776], 22). But, to our knowledge, it was not until the 1880s that the term *coordination* appeared in economics. The history may be summarized as follows:

- Beginning in the 1880s, *coordination* was used to describe the effective arrangement of activities within a firm. The referent concatenation would be the array of factors and activities within the firm.
- In the early 20<sup>th</sup> century, *coordination* was extended beyond the firm, to describe the pleasing arrangement of activities within the entire economic system—like Smith’s discussion of all that goes into the making of the woolen coat. Here, the referent concatenation would be a much wider skein of factors and activities, even the global economy.
- Beginning ca 1960, with Thomas Schelling and game models, *coordination* took on another meaning: mutual meshing of actions, one to another. In the ensuing decades the mutual idea of coordination caught on and became focal.
- Nowadays, the idea of mutual coordination overshadows concatenate coordination. Also, the two are sometimes conflated.

- Meanwhile, outside the mainstream, “Austrian” economists led by Israel Kirzner have sustained a discussion of coordination.

Here we provide a narrative and empirical evidence for it. Figure 1 summarizes the findings based on JSTOR searches of five major general economics journals. Earlier, the dominant usage of “coordination” was concatenate, but in 2001 it was mutual. We discuss the figure later—here we just want to flash the dramatic reversal.

Figure 1:  
For a long time concatenate dominated, but now mutual does.



Source: JSTOR; see discussion where this figure reappears.

But in this paper, we also spend a good deal of time working with concepts. In the conceptual work, we invite readers to resuscitate concatenate coordination. We favor *both* coordinations—concatenate and mutual. But, in order to juggle both, we must distinguish the two. Also, we find Kirzner’s work misguided, and, since he and his followers claim to represent the Hayekian tradition of concatenate coordination, we feel impelled to explain why the reader should not follow Kirzner on coordination.

## The Two Coordinations

The dictionary gives two definitions of the verb *to coordinate*. One is transitive and one is intransitive. (Transitive verbs take direct objects, while intransitive do not.)

An interior designer coordinates colors, patterns, and textures to make a pleasing look. The businessperson coordinates factors to make profits. The verb is transitive and the result is an overall pleasure from the perspective of the coordinator or of anyone else like her. Components link one to another, forming a chain or concatenation. Call it *concatenate coordination*.

Then there is the intransitive verb: The Japanese drive on the left, and one coordinates to that convention. Call that *mutual coordination*. Mutual coordination is usually more or less manifest, like waltzing together. They might not be thinking about it, but they are potentially made aware that they are taking part in mutually coordinated action.<sup>1</sup>

Concatenate coordination refers to a concatenation, and the referent concatenation depends on what we are focusing on—we can “zoom in” and “zoom out.” Concatenate coordination can describe the skeleton of activities within a firm, where affairs are coordinated “top down,” but it can also describe the pleasing quality of a wider skein of affairs lacking any top-down direction. In either case, improvements can be described as better coordination.

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<sup>1</sup> The distinction between the two coordinations is set out in Klein (1997) and (1998). The present discussion concords entirely with those papers, however, here we use different nomenclature. What is here called “concatenate coordination” was there called “metacoordination,” and what is here called “mutual coordination” was there called “coordination” (*simpliciter*).

Mutual coordination describes mutually intermeshing behavior: Given what you are doing, my behavior is best for me; *and*, given what I am doing, your behavior is best *for me*. Mutual coordination is commonly depicted as a coordination game where there are at least two coordination equilibria (Lewis 1969, 8), as in Figure 2.

Figure 2: Mutual coordination:  
A coordination problem with two coordination equilibria

	1	0
1	1	0
0	0	2

Suppose that because of the driver-seat location in our cars we both get higher payoffs by both driving on the right than by both driving on the left. Driving on the left, yield payoffs (1, 1), is less pleasing in a concatenate sense—it is the lesser in *concatenate* coordination. But in the *mutual* sense, everyone driving on the left is just as coordinated as everyone driving on the right. An inefficient coordination equilibrium generally holds a sort of intermediate position in terms of concatenate coordination: Though inferior to some other coordination equilibrium, it will generally be better than possibly relevant outcomes lacking mutual coordination—better that we suffer the inconvenience of driving on the left than that we run the risk of colliding.

One might say: “So concatenate coordination is essentially efficiency, right?” In our view, there are very good reasons to resist such a translation. Terms like “efficiency” and “optimality” suggest a clearly defined maximand or objective function or social-welfare function, while concatenate coordination is more readily allowed to enter the realm of the aesthetic. When discussing beauty or goodness in an aesthetic way—for

example, after we have become familiar with a piece of music—we do not pretend to a well-defined standard or criterion. We do not invoke a specific “music excellence function,” nor even entertain the notion of such a thing. Moreover, as we discuss the piece of music, we not only enhance our appreciation of that piece of music, we also cultivate our sensibilities of *what is beautiful* in music. Likewise, “coordination” talk (in the concatenate sense) readily allows the discussion to open up, explore, debate, and reform *our sensibilities* of what is good or beautiful in society, while “efficiency” talk restricts itself to instrumentalities, barred from criticizing the maximand. With “coordination,” we not only discuss instrumentalities, we negotiate our respective notions of *the mind imagined to behold and aesthetically react to the concatenation*. Both ends of the conversation are being explored and refined in conjunction with one another.

The two coordinations are conceptually and empirically distinct. Enhancements in concatenate coordination do not necessarily entail enhancements in mutual coordination. In fact, enhancement in mutual coordination might diminish a relevant frame of concatenate coordination, for example, when firms collude or predators conspire.

But the two interrelate. In a relay race, a team’s complete run is a kind of concatenate coordination, but along the way are moments of mutual coordination, when one passes the baton to the next. In a firm, there is the “big picture” view from the boardroom—the aspirational concatenation is called “*the plan*.” But in the firm there are also myriad instances of mutual coordination, both among workaday interactions and among longer-term habits, attitudes, and plans. The referent concatenation typically subsumes many instances of mutual coordination.

Also, the referent concatenation might, in the eyes of the “chiefs,” correspond closely to the mutual coordination among them. Suppose the owner of a golf course and the owner of a golf school sit down together to cooperate in how they will jointly operate their businesses. From the Schelling point of view, each has his individual interests, and each mutually coordinates his own plans and actions with those of the other.<sup>2</sup> However, there is also a sense in which *the two form a cooperative unit* (variously termed the *team, group, association, partnership, consortium, cartel, ring, cabal*, etc.) that coordinates the set of activities (golf facilities and golf instruction) in the concatenate sense. But such “isomorphism” between the two coordination occurs only when the mutual coordinators are also the “chiefs” of the referent concatenation.

### **The Two Coordinations and Cooperation**

In sports, members of a team cooperate in trying to win. In civic life, neighbors cooperate in keeping the neighborhood clean. In a bread factory, people cooperate in producing bread—assuming, that is, that they do cooperate!

*Cooperation* can be defined as the mutual coordinating of each’s actions in a context in which each cooperator perceives, however fuzzily, to be making a contribution *to the same referent concatenation*—a good team performance, a clean neighborhood, a productive bread factory. There is a mutual awareness of cooperating in the achieving of

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<sup>2</sup> We said that mutual coordination derives from the intransitive usage of *to coordinate*, and yet it seems that the verb here is taking a direct object: “each mutually coordinates his own plans and actions.” However, the direct object is reflexive—it is oneself (or a part of oneself). In general, intransitive usages can be made formally transitive by putting in a reflexive object. For example, the intransitive “I walk down the street” can be made transitive as “I walk *my body* down the street.” To make the point another way, notice that we could have instead written the clause in question as the intransitive by eliminating the reflexive objects, leaving “each mutually coordinates with the other.”

the concatenation. The *spirit* of cooperation is especially pronounced when there is not only mutual awareness but mutual sentiment in the experience. “We did it together!”

Some have depicted the free economy as a system of cooperation. Properly speaking, however, we should resist calling the Smith-Hayek spontaneous order a system of cooperation. True, the spontaneous order entails *myriad instances* of cooperation. But it also entails myriad instances of competition. It entails myriad instances of rather impersonal exchange, which, as cooperative moments, usually are only tiny and often are ambivalent. It also entails myriad instances of deception and misrepresentation. It entails a lot of things, not just instances of cooperation.

Edward Gibbon Wakefield distinguished between “simple co-operation,” concordant with the usage we favor, and “complex co-operation,” essentially, a system of spontaneous concatenate coordination.<sup>3</sup> John Stuart Mill ([1871], 118f) followed and elaborated Wakefield’s distinction.

Adam Smith (1776, 23, 26) said the day laborer obtains his woolen coat by virtue of “the assistance and co-operation of many thousands,” but a bit later, when Smith observes that man “stands at all times in need of the co-operation and assistance of great multitudes,” he says, “while his whole life is scarce sufficient to gain the friendship of a few persons,” suggesting that it isn’t simply cooperation that yields him the coat.

Frédéric Bastiat exemplified the tendency to depict the free market system as a system of harmony and cooperation. In *Economic Harmonies*, he used “co-operation” recklessly, and celebrated the market system as “a marvelous association” (Bastiat [1850], 68). Another free-trade champion Henry George writes similarly: “But where the

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<sup>3</sup> Wakefield is quoted at length by Mill 1871/1909, 116-18. The citation given is “Wakefield’s edition of Adam Smith, vol. I, p. 26”.

natural rights of all are secured, then competition . . . becomes the most simple, most extensive, most elastic, and most refined system of co-operation” (George [1886], 307).

At a different ideological pole, Karl Marx rightly emphasized that the capitalist system, *in the whole*, was not cooperation—and ultimately condemned it for that. “[A]ll labour in which many individuals cooperate necessarily requires a commanding will to coordinate and unify the process . . . much as that of an orchestra conductor” (Marx 1998, 382). As a matter of ethics and human fulfillment, Marx wanted the vast social concatenation to be a universal experience in mutual coordination—that is, he wanted everyone in society to be, in awareness and sentiments, mutually coordinated to the idea of the great concatenation as a cooperative project.<sup>4</sup>

### **Central Direction versus Decentral/Spontaneous Action**

Each kind of coordination invites the distinction between “centrally directed” and “spontaneous”<sup>5</sup>:

- *Spontaneous concatenate coordination*: Ordinary people alter parts of the concatenation with only local intentions, that is, quite unmindful of the effects on the concatenation as a whole. As Smith said, the vast concatenation that produces a woolen coat was planned by no single mind. Hayek called the process “spontaneous order.”
- *Spontaneous emergence of convention*: As explained by Carl Menger ([1883]), Thomas Schelling (1960, 1978), Robert Sugden (1989), Paul David (1988), Brian

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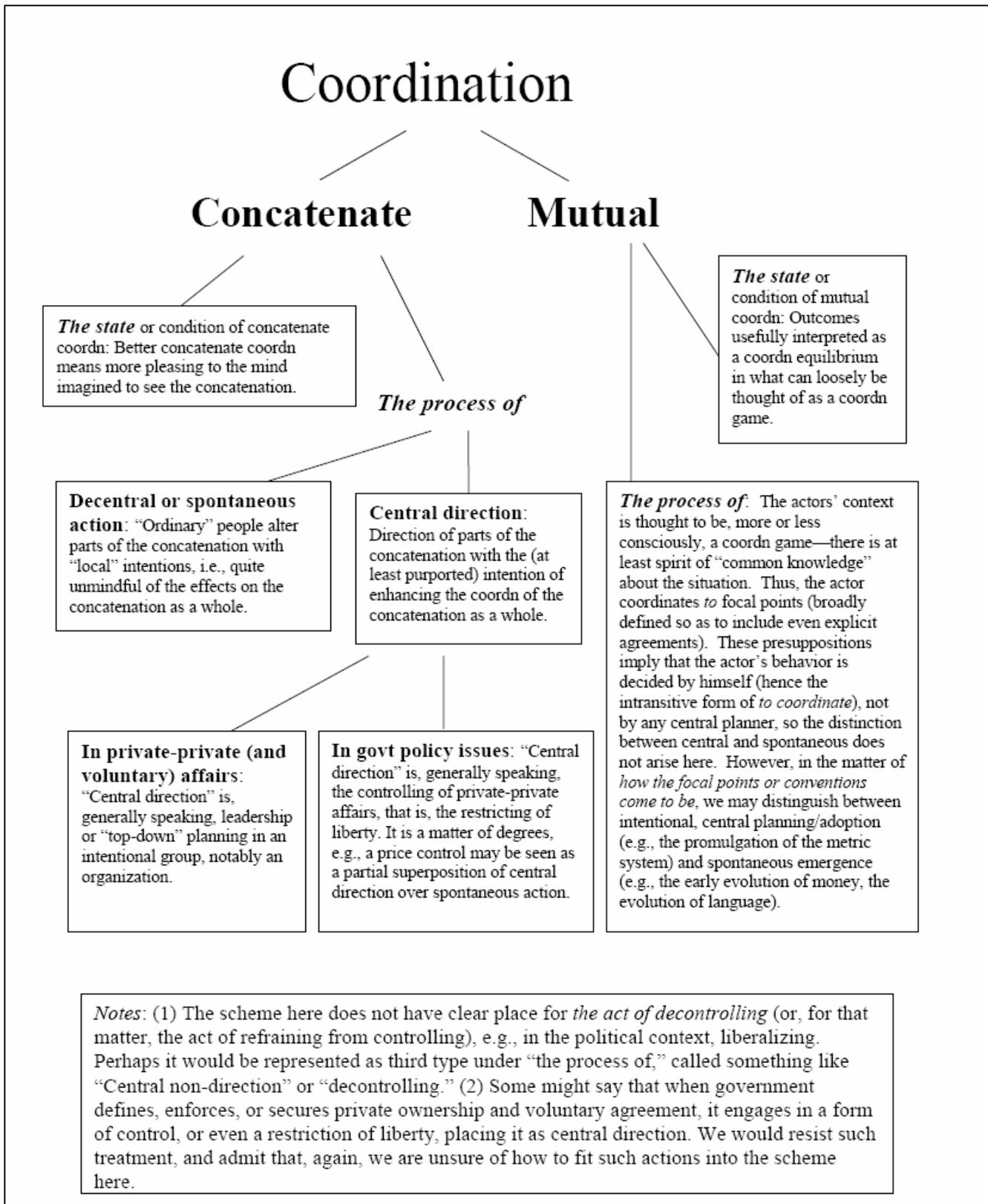
<sup>4</sup> On Marx, see Tucker (1961, 188-223 and Klein (2005, 13-14).

<sup>5</sup> Barry (1982) discusses these intellectual traditions and nicely distinguishes between the spontaneous coordination of the larger concatenation and the spontaneous emergence of institutions.

Arthur (1994), and others, mutual coordination sometimes proceeds without central direction or leadership, and, more importantly, *learned regularities* in behavior sometimes emerge without having been anyone's intention, constituting *conventions* (Lewis 1969), such as languages, monies, norms, or technological standards.

Figure 3 reiterates and elaborates several distinctions. In addition to the primary distinction between concatenate and mutual, it distinguishes *the state or condition* and *the process of*. For concatenate coordination, it further distinguishes central direction and decentralized/spontaneous action (and it remarks on the parallel in how focal points or conventions come to be).

Figure 3: Semantic Analysis of *Coordination*



The primary distinction between concatenate and mutual provides a framework for tracking usage of *coordination*. The distinction also helps to identify when the two have been conflated.

### **In the Beginning: Concatenate Coordination within the Firm**

As detailed in the Excel file ([link](#)), we have searched extensively online at the New School's history of economics website and the Liberty Fund "Library of Economics and Liberty" website—in all, well over 100 works covering many of the main works of political economy. We were quite surprised to find that terms of "coord" or "co-ord" scarcely occur anywhere prior to 1880, and when it does it often is used in ways not relevant. There are a few pre-1880 occurrences by Herbert Spencer in *First Principles* (1862), where he extends biological ideas to social theory, by likening the coordination of parts of an organism to the coordination of parts or functions of a society. Spencer was significant in advancing *coordination* in the social sciences. We find a small number of interesting occurrence shortly after 1880 in the Spencer-like biological line of thought, for example in Simon Newcomb (1886), Karl Marx (in works likely written years prior to publication), George Bernard Shaw, Sidney Webb, and Franklin Giddings. But this line does not gel in economics.

It is appropriate, we think, to highlight Simon Newcomb's usage of *co-ordination* as the first significant and squarely "economic" occurrence. Known more as an astronomer and mathematician, Newcomb brought a new perspective to economics. John Maynard Keynes (1930; p.209, n. 1) described Newcomb's *Principles of Political*

*Economy* (1886) as “one of those original works which a fresh scientific mind, not perverted by having read too much of the orthodox stuff, is able to produce from time to time in a half-formed subject like economics.” Newcomb’s *Principles* emphasize the idea of the social organism, highlights Spencer’s formulation of social progress (p. 141), and on one page (138) uses the term *co-ordination* in the concatenate sense.

But it is Newcomb’s earlier usage that we wish to highlight. In “The Organization of Labor” published in the *Princeton Review* in 1880, the term *coordination* is introduced in the following passage:

As society advances we find great changes both in the fundamental ideas on which organizations rest and in the objects for which they are intended. We must expect that, as a rule, each society will tend to the form best adapted to its preservation and efficiency under all existing conditions both internal and external. Now, in an advanced state of society these ends can be attained only by the formation of organisms having perfect co-ordination among the functions of their members, and there are certain conditions under which this co-ordination cannot be secured except by a system of subordination not in unison with the ideas of equal rights now prevalent. (Newcomb 1880a, 395)

Activities must be coordinated top-down to produce a pleasing outcome. The members of an organization must be subordinate to the coordinator:

With every increase in the number of persons co-operating, and in the delicacy of the material and instruments employed, comes an increased necessity for a precise

co-ordination among the efforts of all. Thus there grows up an organization which in its outward form is more like a well-disciplined army than like a collection of individual producers of past centuries. (Newcomb 1880a, 398)

In the decades after 1880 we find increasing occurrences of *coordination*. We have used *JSTOR* to search five lead journals: *Quarterly Journal of Economics* (begun 1886), *Economic Journal* (1891), *Journal of Political Economy* (1892), *American Economic Review* (1886/1908/1911, including precursor AEA publications), and *Economica* (1921). The results show that coordination meant concatenate coordination (with some occurrences of ambiguous or extraneous usage). During the early period, the focus is on the entrepreneur/owner/manager as the coordinator of activities and factors within the firm. Leading figures in the discussion are Newcomb, Frederick B. Hawley, John Bates Clark, Thorstein Veblen, Frank H. Knight, and Austin Robinson. For example, John Bates Clark in *The Distribution of Wealth* (1899) had the following to say in discussing how income is divided up:

The function of this natural law ... causes the whole annual gains of society to distribute themselves into three great sums—general wages, general interest and aggregate profits. These are, respectively, the earnings of labor, the earnings of capital and the gains from a certain coordinating process that is performed by the employers of labor and users of capital. This purely coordinating work we shall call the *entrepreneur's* function, and the rewards for it we shall call profits. The function in itself includes no working and no owning of capital: it consists

entirely in the establishing and maintaining of efficient relations between the agents of production. (Clark 1908 [1899], Chapter I.4; [link](#))

Like Newcomb, Clark is talking about top-down concatenate coordination within the firm. The discussion was joined by Frank Knight, who, in *Risk, Uncertainty, and Profit* (1921) says “[t]he entrepreneur is the owner of all real wealth, and ownership involves risk; the coordinator ‘makes decisions,’ but it is the entrepreneur who ‘accepts the consequences of decisions’” (1921, 45). Thusly, leading economists focused on top-down coordination within a firm, and debated how to distinction certain functions and the returns they earned.

### **Other Early Occurrences**

**Transportation.** Our investigation finds another batch of early *coordination* occurrences among transportation economists, who speak of the coordination of facilities and trips. Again the meaning is concatenate. The discussion appears to have proceeded largely independently of that about the firm. For the most part, the transportation occurrences speak of a top-down process of transportation-system planning.<sup>6</sup>

**“Coordination of the laws of distribution.”** We must note one other batch: Numerous economists used the expression “coordination of the laws of distribution” to describe the

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<sup>6</sup> One very interesting piece, however, Peterson (1930), explores the usages of *coordination* within the transportation literature, and seems to be trying to impress on transportation specialists that the (concatenate) coordination of transportation services does not have to occur by central planning (see esp. 665, 669-71, 674).

working out compatible theories of economic value and earnings.<sup>7</sup> This usage pretty much dies out by 1907 and has no bearing on our inquiry.

### **1930s: LSE Economists Go beyond the Eye of Any Actual Coordinator**

Up to around 1930, the primary economic talk of “coordination,” aside from the transportation literature, concerned the concatenation of activities within the firm. But in the 1930s a new moment occurs, and it may be marked by a lecture given by Friedrich A. Hayek in 1933 at the London School of Economics and published that year in *Economica* as “The Trend of Economic Thinking.” Hayek takes *coordination* to the extensive economic cosmos. This step was not entirely novel,<sup>8</sup> of course, but it now becomes front and center in Anglo-American economics. The LSE during the 1930s seems to have bubbled with talk of coordination beyond the firm.

In the lecture Hayek extends the idea of concatenate coordination beyond the eye of any actual coordinator:

From the time of Hume and Adam Smith, the effect of every attempt to understand economic phenomena – that is to say, of every theoretical analysis – has been to show that, in large part, the co-ordination of individual efforts in society is not the product of deliberate planning, but has been brought about, and

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<sup>7</sup> Wicksteed published a book in 1894, *Coordination of the Laws of Distribution*; other authors (see Excel file) using the term in such fashion are Hobson 1891, Patten 1893, Hadley 1894, 1897, Haynes 1895, Bohm-Bawerk 1895, Fisher 1896, Hollander 1903, Tuttle 1903, Tuttle 1903, Walker 1904, and Fetter 1907.

<sup>8</sup> Besides some of the writers with Spencer-like biological analogies, other scattered and fleeting occurrence of “coordination” meaning spontaneous concatenate coordination by Henry George, John Bates Clark, Philip Wicksteed, Ludwig von Mises, David Friday, Lawrence Frank, Raymond Bye, and Shorey Peterson may be found in the Excel worksheets.

in many cases could only have been brought about, by means which nobody wanted or understood, and which in isolation might be regarded as some of the most objectionable features of the system. (Hayek 1933, 129)

Hayek is describing independent actions that lead to outcomes beyond the actor's intention and comprehension. What Hayek is discussing is spontaneous order or, in our nomenclature, undirected concatenate coordination. Like the concatenate coordination within the firm, coordination means pleasing arrangement or desirable outcome. *But, pleasing to whom?*

The matter, Hayek emphasizes, calls for great delicacy. He suggests that society has a “sense” like an “organism,”<sup>9</sup> yet he makes the suggestion with great caution. Classical liberals such as he dread the hazards of any society-as-organism metaphor. He notes: “The limitations of language make it almost impossible to state it without using misleading metaphorical words” (130). The lecture is quite remarkable as an early expression of the dilemmas in opposing society-as-organization notions while trying to say that liberal processes are coordinative. But, coordinative to whom? In the case of the firm, the answer is clear—the owners/managers. But for a polycentric spontaneous system, there is no tangible analog.

Here, we suggest a fictitious impartial mind able to behold the extensive tapestry of social affairs, and inclined to judge it in a manner that parties to the discourse situation are presumed to find acceptable. This imagined judge is like that being whose hands,

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<sup>9</sup> On the matter society as organism, Hayek cites the 1923/1932 German language editions of Mises' *Socialism* (1981). Mises cites Spencer several times, but never in connection with society as organism. Neither Hayek nor Mises cite Newcomb's *Principles of Political Economy* (1886), but it is noteworthy that Newcomb, like Hayek, articulates cautions while going forward with the organism metaphor (see esp. Newcomb 1886: 7-8).

according to Adam Smith, are invisible. Alluding to Hume and Smith, Hayek too wants to talk about coordination beyond the eye of any actual human coordinator.

At about the same time, similar ideas were being explored at the LSE, by Arnold Plant, W.H. Hutt, and Ronald Coase.<sup>10</sup> Ronald Coase was writing his seminal article “The Nature of the Firm,” drafted years prior to publication in *Economica* (1937). In it he says, “An economist thinks of the economic system as being co-ordinated by the price mechanism, and society becomes not an organization but an organism” (Coase 1988 [1937], 34). Coase is noting what Hayek had been discussing and emphasizing that at one level prices help to coordinate economic activity. But Coase makes another observation:

Marshall introduces organization as a fourth factor of production; J.B. Clark gives the co-ordinating function to the entrepreneur; Knight introduces managers who co-ordinate. As D.H. Robertson points out, we find “islands of conscious power in this ocean of unconscious co-operation like lumps of butter coagulating in a pail of buttermilk.” But in view of the fact that it is usually argued that co-ordination will be done by the price mechanism, why is such organization necessary? Why are there these “islands of conscious power”? Outside the firm, price movements direct production, which is co-ordinated through a series of exchange transactions on the market. Within a firm these market transactions are eliminated, and in place of the complicated market structure with exchange transactions is substituted the entrepreneur-co-ordinator, who directs production. It is clear that these are alternative methods of co-ordinating production. Yet, having regard to

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<sup>10</sup> Incidentally, as shown in the Excel worksheets, we were able to search a few of Edwin Cannan’s works, and found no occurrences.

the fact that, if production is regulated by price movements, production could be carried on without any organization at all, well might we ask, Why is there any organization? (Coase 1988 [1937], 35-36)

Coase is seeing the two levels of concatenate coordination, the unplanned level mediated by prices and the planned level within the firm. On the heels of Hayek's step beyond the eye of any actual coordinator, Coase writes as though Hayek's formulation is commonplace and that the outstanding question is why there should be any planned coordination at the level of the firm. He adds:

In view of the fact that, while economists treat the price mechanism as a co-ordinating instrument, they also admit the co-ordinating function of the "entrepreneur," it is surely important to enquire why co-ordination is the work of the price mechanism in one case and of the entrepreneur in another. The purpose of this paper is to bridge what appears to be a gap in economic theory between the assumption (made for some purposes) that resources are allocated by means of the price mechanism and the assumption (made for other purposes) that this allocation is dependent on the entrepreneur-co-ordinator. We have to explain the basis on which, in practice, this choice between alternatives is effected. (Coase 1988 [1937], 37)

Coase crystallizes concatenate coordination at two levels, the extensive economic system and the individual firm.

Coase may have treated Hayek's perspective as commonplace because it was so at the LSE. W.H. Hutt, who had studied at the LSE, published "Co-ordination and the Size of the Firm" in the *South African Journal of Economics* in 1934. He extended the domain of coordination beyond the firm, suggesting, decades prior to Coase's famous 1960 paper, that, under certain conditions, the coordination of factors would be same regardless of whether the concatenation were planned by a single entrepreneurial authority or among a number of separate entrepreneurs (Hutt 1934, 396-397). Likewise, Coase's mentor Arnold Plant in "Centralise or Decentralise?" published in 1937, also extended coordination beyond the firm, speaking, for example, of firms submitting "to the co-ordination imposed upon their activities by the price mechanism of the market" (Plant 1937).

One might take the two levels to correspond to "unplanned" and "planned," but a society's economic system is subject to degrees of direction, control, and planning, so an extensive economic system is not necessarily simply "unplanned." Moreover, firms might vary in their degree of central direction, so the concatenate coordination within a firm is not necessarily simply "planned." But, broadly speaking, the two levels correspond to less and more planning *at the level that "sees" the referent concatenation.*

The two sources, the price system and conscious direction, were central to some of the most important debates in economics. The idea of central planning was to supersede liberal processes, instead making the economy essentially "one big factory" (Marx's phrase<sup>11</sup>), where managers make the production decisions, albeit in some schemes with surrogate pricing and feedback. The other major debate was whether the

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<sup>11</sup> Marx (1936, 391).

economy was self-coordinating, a debate brought forth particularly by the Great Depression and John Maynard Keynes.

### **Mutual Coordination Emerges and Becomes Focal**

*Coordination* meant concatenate coordination.

But things started to change with the advent of Thomas Schelling and game models. Schelling's *The Strategy of Conflict* (1960) popularized a different meaning of *coordination*. He gives the example of a man trying to find his wife after they've become separated in a department store:

What is necessary is to coordinate predictions, to read the same message in the common situation, to identify the one course of action that their expectations of each other can converge on. They must '*mutually recognize*' some unique signal that coordinates their expectations of each other. (Italics added)

He adds:

People *can* often concert their intentions or expectations with others if each knows that the other is trying to do the same. Most situations – perhaps every situation for people who are practiced at this kind of game – provide some clue for coordinating behavior, some focal point for each person's expectation of what the other expects him to expect to be expected to do. (Schelling 1960, 57)

Here coordination is understood as something we hope to achieve in our interaction with others. It depends on each individual using focal points to imagine what is going on in the minds of others. It is manifest in that the individuals are aware of the challenge and results.

Schelling also discusses situations with divergent interests. He finds the results similar to tacit bargaining with common interests:

If we ask what determines the outcome in these cases, the answer again is in the coordination problem. Each of these problems requires coordination for a common gain, even though there is rivalry among alternative lines of common action. But, among the various choices, there is usually one or only a few that can serve as coordinator. (Schelling 1960, 65)

So even if interests diverge, as in Figure 4, there are only certain “strategy profiles” where actions are mutually coordinated.

Figure 4: Mutual coordination:  
A coordination problem with partly conflicting interests

	2	0
1		0
	0	1
0		2

Schelling argues that coordination is also important in bargaining: “The fundamental problem in tacit bargaining is that of *coordination*; we should inquire, then, what has to be coordinated in explicit bargaining. The answer may be that explicit

bargaining requires, for an ultimate agreement, some coordination of the participants' expectations" (1960, 69-70). Schelling proposes that expectations may be brought into convergence with the help of a focal point (71-72). What is required is a kind of mutual agreement. Schelling adds, "The coordination game probably lies behind the stability of institutions and traditions [or conventions]" (1960, 91). Schelling is acknowledging that this form of coordination is central to conventions, and mentions no other kind of social order. Subsequently, David K. Lewis, who studied with Schelling, developed the idea of coordination equilibrium, common knowledge, and convention, in *Convention; A Philosophical Study* (1969). The set of concepts was enriched by Schelling's *Micromotives and Macrobehavior* (1978) and many other works, such as Ullman-Margalit (1977), Sugden (1986), Young (1996) and Chwe (2001). All this was rooted in mutual coordination, and mostly ignored concatenate coordination. In this literature, *coordination* meant mutual coordination.<sup>12</sup>

Schelling, Lewis, and others provided canonical formulation of (mutual) coordination, and proof of relevance. Game theory got legs in the 1970s and took off in the 1980s. With the rise of game theory, the word *coordination* was increasingly understood to mean mutual coordination. The older understanding of the term (concatenate coordination) was increasingly eclipsed and marginalized. Economists spoke instead of "social welfare," the "social welfare function," "optimality," or simply "efficiency." Economists now consumed Schelling, "battle of the sexes," "cheap talk," and path dependence, all mutual.

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<sup>12</sup> At the outset of *Micromotives and Macrobehavior* (pp. 20-23) Schelling discusses the extensive market process and uses the term *coordination* principally in the concatenate sense, and endorses the liberal order (22). He does so, however, to make clear what he is not focusing on: "I am interested here in how much promise the economist's result has outside of economics" (23), which he associates with markets, and the remainder of the book focuses on issues of *mutual* coordination.

Was Schelling's refocusing of *coordination* on "mutual" an irresponsible straying from well-established economic usage? Not at all. He simply pursued a meaning well established in the wider civilization, including the dictionary. That the economic literature so predominately used *coordination* in the concatenate sense, and that he didn't let that stop him, is testimony to his respect for common language and common experience, as well as his intellectual independence.

### **Mutual Is Now Dominant**

Since the 1980s and continuing today, the number of articles and books working in mutual coordination are simply innumerable. To test the dominance of mutual coordination in economics nowadays, we searched articles of *QJE*, *EJ*, *JPE*, *AER*, and *Economica*, on "coordination" or "co-ordination," for the most recent year available in *JSTOR*, 2001. The search returned 33 articles. Only one article was using the term primarily in the concatenate sense, while 22 used it in the mutual sense (others being ambiguous or neither). As shown in the "2001" worksheet, mutual coordination now dominates in mainstream economics.

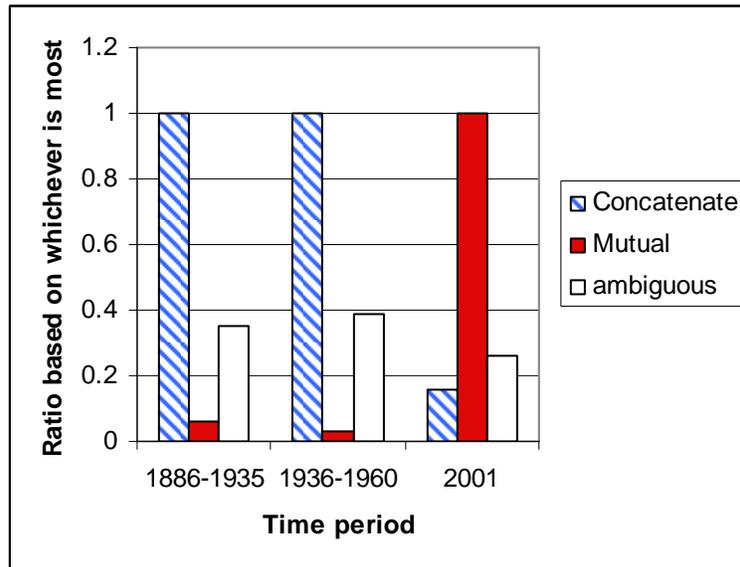
The switch in emphasis from concatenate to mutual can be found in a variety of areas. In the work on path dependency *coordination* means mutual coordination: "lock-in" is about society coordinating on an inferior standard (Arthur 1994). Building on Lewis, economists have refined the idea of convention, rooted in mutual coordination (Young 1996). Many articles now address how governments of different nations or jurisdictions coordinate their policy decisions with one another.

In macroeconomics, where one would expect to find coordination meaning spontaneous concatenate coordination, we now find mutual coordination. New Keynesian macroeconomics in particular uses the coordination game to describe coordination failures in the macro economy (e.g., Diamond 1982; Bryant 1983; Cooper and John 1988; Ball and Romer 1991). In the past, a coordination failure would mean not reaching a pleasing outcome due to the failure of prices and institutions to promote beneficial production and exchange. Now coordination failure means coordinating on an inferior coordination equilibrium—such as a group of producers failing simultaneously to lower prices even though they would all be better off if they did all lower prices.

### **JSTOR Searches of Five Major Journals**

Figure 5 repeats Figure 1. Again, we have used *JSTOR* to search five lead journals: *Quarterly Journal of Economics* (begun 1886), *Economic Journal* (1891), *Journal of Political Economy* (1892), *American Economic Review* (1886/1908/1911, including precursor AEA publications), and *Economica* (1921).

Figure 5 (repeats Figure 1):  
Coordination usage in five major general economics journals



Source: JSTOR searches of *AER*, *Economica*, *EJ*, *JPE*, and *QJE*; see Excel [file](#) for details.

In September 2007, we sampled articles beginning in 1886 because that was the first year of publication of the *QJE*. We wanted to search through 1960 when Schelling's work emerged, and decided to break the period in two and used 1935 as a divider, yielding two pre-Schelling periods, 1886-1935 and 1936-1960. We searched on "coordination" or "co-ordination" in full-text, and limited the search to Articles. The items as listed the Excel sheets are in the order displayed by JSTOR's "Relevance" option for displaying search results—the top 50 for each period. We also sampled articles of 2001, because that was the latest year for which the five journals all had material loaded in JSTOR, yielding 33 results. Thus, the total raw sample represented in Figure 5 is 133 articles. As shown in the Excel [file](#), each paper received a score of either 0 or 1 in the concatenate column, and either 0 or 1 in the mutual column—a small number of papers received a 1 in both columns. Many papers received a 1 in the ambiguous column, usually because the occurrence of "coordination" was brief and open to interpretation as either concatenate or mutual (as in our earlier example of the golf course owner and the golf school owner).

Some papers were marked as not relevant, because “coordination” was used in an extraneous way, for example, only in the title of cited works. A skeptical reader can easily spot-check the Excel file. The bars in the figure are sized so as to represent a ratio of whichever type (concatenate or mutual) occurs most in the period.<sup>13</sup> The results show a dramatic change in usage. Future research could chart the transition from 1960 to 2001 and expand the sample to a wider array of journals and disciplines.

### **Confusion among the “Austrians”**

Now we step back to the 1973-2000 period, and turn critical.

We discuss a school of thought that carried on a discussion of coordination quite separately from the mainstream. While the profession shifted to mutual coordination, the “Austrian” economists, particularly those led by Israel Kirzner, sustained and developed a discussion of coordination following in the arc of Hayek. We include a discussion of the Austrians because in some respects they now speak for concatenate coordination, particularly spontaneous order. Also, the reader might value the knowledge that the present writers “come from” the Austrian tradition. But our discussion now turns critical, as we believe that, in his attempts to fashion a distinct and scientific “Austrian” school of economics, Kirzner has developed unacceptable ideas about coordination.

Israel Kirzner is the “dean” of “Austrian” economics and the primary force in homogenizing Mises, Hayek, and the latter-day “Austrians.” He has his own notions about coordination—more on that shortly—and he claims that they fit Hayek (Kirzner

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<sup>13</sup> The data are as follows: For the first period: 34 concatenate, 2 mutual, 12 ambiguous; for the second period: 36 concatenate, 1 mutual, 14 ambiguous; for 2001: 3 concatenate, 19 mutual, 5 ambiguous.

2000, Ch. 10).<sup>14</sup> In Kirzner, there is a two-step process at work, by which Kirzner asserts that Mises and Hayek really meant what he means by “coordination.” It will help if you let us explain with reference to Figure 6:

Figure 6:  
Kirzner has projected III onto Hayek  
by attributing II to Hayek and equating II and III.

<b>I</b> <b>Concatenate</b>	<b>II</b> <b>Fulfillment</b>	<b>III</b> <b>Opp-exploitation</b>
<p>HAYEK’S (and Mises’s) statements about coordination.</p> <p>They meant concatenate coordination.</p> <p>Kirzner concedes that “at least part of the time” Hayek meant concatenate, but argues that Hayek <i>chiefly</i> meant what he means by “coordination”.</p>	<p>Statements about the fulfillment or mutual compatibility of expectations/plans.</p> <p>Hayek says this about <i>equilibrium</i> and about <i>order</i>, not about <i>coordination</i>.</p> <p>Kirzner says this about <i>coordination</i> (as well as <i>equilibrium</i>), and says that effectively Hayek was doing likewise.</p>	<p>Kirzner’s idea of coordination, wherein <i>every</i> unexploited profit opportunity represents a failure in coordination.</p> <p>Kirzner (2000, 133) claims that his coordination is “a clear-cut, objective criterion” of economic “goodness.”</p>

**Column I:** Here belong Mises and Hayek. When they spoke of coordination, they almost always meant concatenate coordination—in particular, the grand concatenation advanced by spontaneous processes. As shown in the Excel [file](#), the occurrences of *coordination* are few in Mises and abundant in Hayek. The meaning is clearly concatenate.

<sup>14</sup> Incidentally, while we may be taken to object to the homogenization and loosely represent a “Hayek camp,” the homogenization has also been criticized by the “Mises camp,” notably Joseph T. Salerno, “Mises and Hayek Dehomogenized” (1993).

**Column II:** Here we put notions about expectations or plans being fulfilled, realized, or mutually compatible.

**Column III:** Here are ideas essential to Kirzner's categorical claims about entrepreneurship and free market processes being coordinative (again, more on that soon). Kirzner's idea of coordination remains ill-defined. He has offered the following unhelpful definition: "A fully coordinated state of affairs, for our purposes, is one in which each action taken by each individual in a demarcated set of actions, correctly takes into account (a) the actions in fact being taken by everyone else in the set, and (b) the actions which the others might take were one's own actions to be different" (2000, 136). That quotation does not reveal what turns out to be crucial, namely the discovery and exploitation, via market activity, of profit opportunities.

Kirzner projects III backwards onto Hayek (and Mises), first, by attributing II to Hayek's meaning of coordination, and, second, by equating II and III. We feel that both steps are unacceptable.

***It is illegitimate to attribute II to Hayek's idea of coordination:*** Hayek spoke of at some length about expectations or plans being fulfilled, realized, or mutually compatible, as do Kirzner and his followers. HOWEVER: In every instance where Hayek spoke of such ideas, he was speaking of either equilibrium or order, *not coordination*.<sup>15</sup>

***It is illegitimate to equate II and III:*** Kirzner has provided other definitions of coordination that are couched more in terms of fulfillment or mutual compatibility of

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<sup>15</sup> In 1937, Hayek wrote: "For a society, then, we can speak of a state of equilibrium at a point of time—but it means only that the different plans which the individuals composing it have made for action in time are mutually compatible" (Hayek 1948 [1937], 41). Likewise, see also Hayek's efforts to clarify "order" at Hayek 1973, 36, 44-55, 103, 106f; 1978, 184.

expectations and/or plans.<sup>16</sup> He often suggests that his idea (that is, idea III) is coincident with Hayek's ideas of equilibrium/order (that is, idea II).<sup>17</sup> But that is mistaken. Profit opportunities can go unnoticed and unseized without anyone ever experiencing lack of fulfillment—that is, disappointment, frustration, or regret. Suppose a valuable new service becomes available and one does not notice it for a year. One does not necessarily feel disappointment or regret. In fact, one may never learn that it had been available for as long as it was. To our knowledge, Kirzner has never addressed this point. Kirzner swirls together II and III. But the swirl is both vague and unable to deliver what Kirzner wants it to. Here we note several problems and provide in footnotes a few examples from Kirzner's writings. Extensive detail can be found in the "Mises Hayek Kirzner" worksheet of the Excel file. Many of Kirzner's pupils and followers subscribe to Kirzner's writings on coordination (for example, Ikeda 1990, Thomsen 1992, Sautet 2000, Boettke 2001).

***Problems in Kirzner:*** Kirzner has labeled the swirl of II and III "plan coordination" (e.g., 2000, Ch. 10). That label appeals to the intuition that each person in the process feels that his or her plans have worked out as he or she expected. The terms *plan* and *coordination* suggest a definite path of action and consequences, but our decisions involve hopes, visions, and vague awareness of possible contingencies. Often, our doings are often better described as "muddling through." There is often ambiguity about whether "our plans" go as expected. They rarely go as well as we wish, and they

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<sup>16</sup> Elsewhere Kirzner defines *coordination* as "the state (or the process leading towards the state) in which the individual plans of independently-acting persons display mutual compatibility" (2000, 190). He adds, "The fundamental idea in this coordination concept is that we (the economic or social scientists) are interested in the extent to which the decisions made by an individual correctly anticipate (and take advantage of) the decisions in fact being made by others" (2000, 191).

<sup>17</sup> Here is an example of where Kirzner writes as though opportunity-exploitation and expectations/plans fulfillment coincide: "disappointment and/or regret...must ultimately ensue from patterns of action which incorrectly anticipate and depend upon the actions of others in the system" (2000, 145).

almost never go in a way that is utterly surprising, and how we describe the experience might depend on the discourse situation. Further, suppose that people learn to expect little. Does “plan coordination” depend on the dispositions or personalities of the individuals involved? Third, plans, expectations, and attitudes are quite unobservable and unverifiable, aside from introspection and close involvement, and, even then, ambivalence and ambiguity remain.

On top of the vagueness problems, there is the problem that Kirzner’s claims about the coordinative tendencies of entrepreneurship, competition, and free markets are decidedly unpersuasive when interpreted in terms of Kirzner’s definitions. By all intuitive accounts, entrepreneurial creative destruction often upsets people’s plans. Competitors often surprise and trouble established businesses, and upset customs. Kirzner begs the question by saying, in effect: Well, their plans were fated to disappointment.<sup>18</sup>

Moreover, there is no clear reason why state regimentation of economic sectors, as in the postal monopoly or the public school system, or, for that matter, life inside a prison, cannot satisfy Kirzner’s explicit definitions of *coordination*. Even in the case of interventions like occupational licensing or the minimum wage, there is no strong case to be made that people intuitively sense plan frustration or disappointment to an extent greater than they would in freer markets. Whatever the regime, people adjust their plans, hopes, expectations, and attitudes. Finally, Kirzner claims that *in every instance* the

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<sup>18</sup> Kirzner purports to deal with this objection (Kirzner 1992, 9 and 2000, 142f, 249f), but he never zeros in on an action or event to be judged as good or bad for coordination, and thereby avoids the aggregation problem in claiming that successful entrepreneurial action is always coordinating. Had he zeroed in on an action or event (such as Henry Ford developing the automobile rather than taking up a pastoral life of farming, or being struck by a bolt of lightning), he would have to admit that the absence of action would have preserved some people’s plans (and well-being), and that the “nonetheless” claim of better coordination depends on some kind of aggregation, which he denies (e.g., 2000, 144).

successful seizing of entrepreneurial profit in the market is coordinative,<sup>19</sup> but that claim is simply not persuasive,<sup>20</sup> as noted by Brian Loasby (1982, 127-28).<sup>21</sup>

*Another fundamental problem:* Kirzner (2000, 139) says we can speak of better or worse coordination only with respect to voluntary developments within a property-rights regime. That is, you can't compare across regimes when property-rights have been involuntarily reassigned, as with a change in regulation. But doesn't such a view defeat much of the purpose of developing our ideas on coordination? Moreover, Kirzner deviates from such a view when he indicates interventions as discoordinative moves: "Imposed price ceilings may, similarly, not merely generate discoordination in the markets for existing goods and services (as is of course well recognized in the theory of price controls); they may inhibit the discovery of wholly new opportunities." This seems like a clear instance of Kirzner saying that the standard inefficiencies of price controls instantiate discoordination. But under price controls there is not necessarily any opportunity for individuals to do better than they are doing, nor is there necessarily any

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<sup>19</sup> For example, Kirzner (1973, 222) writes: "to identify absences of coordination among the plans of market participants it is sufficient to identify profit opportunities"; at 2000, 86 he denies "a possibly faulty functioning of the market," by which he means that coordination is never set back by the successful entrepreneurial seizing of profit.

<sup>20</sup> Kirzner (1992, 166-79) discusses path-dependence, and freely admits that voluntary processes might select and preserve inferior institutions. But he protects his 100% claim about the progressively coordinative nature of the market by separating the development of "institutions" from market activity. He does not discuss, or even acknowledge, that the "institutions," acknowledged to be susceptible to unfortunate path dependence, very often interface intimately with what he calls "the market," that is, he does not acknowledge that entrepreneurs, businesses, and other voluntary players do things to initiate or promulgate "institutions" in the course of their "market" activity. Had he acknowledged that, he would, it seems to us, had to have admitted that sometimes they take actions (successfully grasping profit opportunities) that are not coordinative.

<sup>21</sup> Kirzner (1992, 13-37) postures as though he will engage the point that successful, voluntary seizing of entrepreneurial profit might not be coordinative overall, for example in a speculative maneuver before the bubble bursts or by a non-coercive misleading of customers, but Kirzner never in fact engages that claim. Kirzner holds on to the idea that every instances in the market of successful, voluntary seizing of profit is coordinative.

frustration of plans or expectations. Other than a notion of concatenate coordination, what definition of coordination could Kirzner be invoking here?

Klein (1997) proposed that Kirzner's basic claims about entrepreneurship tending to advance coordination, as well as his corresponding arguments about free-markets usually being better than intervention, can be maintained by thinking of concatenate coordination—idea I in the table—and by relaxing the claims to versions less than 100%. But the suggestion was vigorously resisted by Kirzner (2000, 132-148, 199).

Our view is that economists can preserve the important claims about free markets generally advancing coordination, and generally doing so better than intervention, claims true to Hayek. It is sound to see both competition and entrepreneurship as being coordinative, in that they usually—not always—bring about changes in the grand concatenation that make it better coordinated in the eyes of the humane mind imagined to be able to behold it. Lower cost firms replace higher cost ones, consumers find new and better goods and services, people find more satisfaction in their work, and so on. Such general sensibilities lie behind Adam Smith's presumption of natural liberty, and ultimately entail a sense of beauty “not unlike that which we ascribe to any well-contrived machine” (1790, 326). We sometimes likewise appeal to that sense of beauty by referring to spontaneous orders in nature, such as a crystal, a snowflake, or a dove's tail—all are pleasing concatenations. Meanwhile, government intervention typically brings a variety of effects that the imagined mind regards as baneful.

Our own take is that, at the crucial moment, Mises, Kirzner, the latter-day “Austrians,” and even to some extent Hayek failed to proclaim that they are invoking some kind of greater sensibility about the desirable, a sensibility that necessarily is, as

Adam Smith put it, “loose, vague, and indeterminate,” but certainly not arbitrary or meaningless (Smith 1790, 175, 327). Although Hayek’s approach was more openly humanistic and much closer to Smith, Ludwig von Mises and the two chief promulgators of the Austrian identity, Kirzner and Murray Rothbard (1926-1995), have been very keen to claim scientific foundation for their central ideas, and the Austrian identity preserves this aspect. They declare a scientific foundation for laissez-faire economics.<sup>22</sup> Such declaration would falter if crucial elements of their discourse were less than 100% and openly invoked a “non-scientific” sensibility about the desirable. Such attitudes on the part of Mises, Rothbard, and Kirzner are understandable, given the *zeitgeist* of their times.

With the indicated modifications, the “coordination” teachings of these economists remain basically true and important. Idea I—concatenate coordination—allows for a sense of fulfillment and the dynamic digging up of social betterment opportunities. Along with concatenate coordination, economists should also understand and utilize mutual coordination, of course. But the other Austrian ideas of coordination—ideas II and III—should be jettisoned.

### **Economic Science versus Concatenate Coordination?**

Again, concatenate came first. And it is perfectly correct and natural to the English language—it comes directly from the transitive meaning of the verb *to coordinate*, as in:

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<sup>22</sup> What they should do, in our view, is keep to “by and large” verities and criticism of the scientific pretension of interventionist economics—the principal way, we would argue, of Smith and Hayek.

The entrepreneur coordinates the factors of production within his firm. Spontaneous concatenate coordination extends the idea beyond the eye of any actual coordinator.

Again, there are inter-connections between the concatenate and mutual. Focal points, mutual coordination, and emergent conventions suffuse economic processes. Without them it would not be possible to have the spontaneous order outcome that we observe. Nonetheless, placing too much emphasis on the mutual concepts (focal points, mutual coordination, and conventions) or confusing them with spontaneous order is harmful, because ultimately the conversation is about the big picture, the grand concatenate coordination.

It is precisely because the sensibilities with which we assess a social system's concatenate coordination are ineluctably somewhat "loose, vague, and indeterminate" that we should resist translating such coordination as *efficiency*. Talk of coordination at these broad planes will often entail, not only how best to please the mind imagined to behold the vast concatenation, but, to an inextinguishable degree, also an exploration of *what that mind's aesthetic sensibilities are*. By contrast, efficiency strongly suggests, often misleadingly, a definitive characterization of the maximand (or of the "output" or "social welfare").

We would suggest that the fate of concatenate coordination has been doubly cursed by the folly that has variously been called modernism, positivism, and scientism. Mainstream economists have tried to evade the "loose, vague, and indeterminate" part of the conversation by replacing concatenate coordination with "efficiency," "optimality," and "social welfare function." The actual guts of those are sometimes treated as not their concern, other times treated as much more exact and definite than they really are. Second,

another group of modernists, the Austrians, particularly the Kirzner wing, have tried to fit claims about the coordinative properties of entrepreneurship and free markets to Misesian pretensions of categorical deduction, and have illegitimately read Hayek into their group. The dual curse, along with the rising sun of mutual coordination, has pushed concatenate coordination, particularly of the great skein, off the table of mainstream economics.

An appreciation of concatenate coordination and its history in economics informs the humanistic approach to political economy exemplified by Adam Smith, which sees that aesthetic sensibilities regarding morals and culture not only play a large role in the enterprise of Economics, but are themselves part of the economic issues under discussion.

Concatenate coordination presumes particular ideological sensibilities no more than the idea of beauty in music presumes particular tastes in music. One may maintain that taxpayer subsidization of basic science improves concatenate coordination, etc. It would seem that concatenate coordination can accommodate concerns about public goods, externalities, and natural monopolies, and perhaps also, distribution, addictive behavior, ways of life, identity, and the public culture.<sup>23</sup> Nothing about the idea of concatenate coordination denies that government intervention can improve the concatenation. In discussing the grand concatenation, the conversation is an exploration and negotiation of sensibilities about the good society and its policies.

*Coordination*, in the concatenate sense, especially as applied to the great skein, may not be the all-encompassing term for bottomless goodness. Perhaps it represents a

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<sup>23</sup> Consider the following quotation from Friday (1922, 17): " we [must] scrutinize with the greatest care the assumption so complacently made by many economists that a set of market prices which brings about a proper coordination of the factors of production *effects an ideal distribution of product*" (italics added). Friday speaks of "a proper coordination" of factors on the basis of a mind of one type (interested in narrower productive efficiencies) imagined to behold the concatenation of production. But, we wonder, could he not then also speak of another mind beholding a larger or fuller concatenation of human experience, and say that that concatenation is *wanting in* coordination because of its distributional aspects?

part or aspect of that wellspring. But, nonetheless, it is in that realm of the loose, vague, and indeterminate.

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