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The Use of Knowledge in Firms

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Abstract:

Austrian economics allows us to identify a number of weak spots in the modern economics of organization that all relate to the treatment of knowledge. Specifically, this body of theory is open to the same kind of objections that HAYEK [1937, 1945] raised against economics, namely that it does not incorporate truly dispersed knowledge, and therefore significantly understates the nature and severity of the coordination problems that confront social systems. However, rather than rejecting the modern economics of organization and opting for an alternative research program, this paper suggests that a combined research effort may be worthwhile.

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Austrian economics, the theory of the firm, dispersed knowledge, coordination

JEL Classification

B15, B25, L22, D81

“... from time to time it is probably necessary to detach one’s self from the technicalities of the argument and ask quite naï vely what it is all about” (Hayek 1937: 56)

1. Introduction

In line with the motto for this paper, which is drawn from Hayek’s 1936 presidential address to the London Economic Club (HAYEK [1937]), I want to “quite naï vely” make some basic points about the theory of the firm, or, broader, the modern economics of organization (henceforth, “the MEO”). These points are related to Hayek’s, because they are non-technical, about the treatment of knowledge in economics, and Austrian in flavor. Recall that HAYEK [1937, 1945, 1946] made the fundamental point that economists routinely neglected or sidestepped the division of knowledge and the coordination problem this division raises. This was not only illegitimate, Hayek argued, but also made many phenomena incomprehensible for the economic theorist. The present paper applies this basic Hayekian critique to the MEO, and argues that an Austrian perspective raises issues that are not considered in the MEO. Hence, the title of the paper, which, of course, is a paraphrase of the title of Hayek’s famous 1945 paper.

Briefly summarized, the points are as follows. Although proponents of the MEO (principal-agent theory, incomplete contract theory, transaction cost economics) can point to many scientific advances, it will be argued that this body of theory has a number of weak spots that relate to the treatment of knowledge. Others have argued that there are such weak spots¹; however, the critique here is different, centering on the neglect in the MEO of the kind of dispersed knowledge that HAYEK [1937, 1945, 1946] highlighted. The dispersal of knowledge creates coordination problems that go beyond the incentive coordination problems that are treated in the MEO, and are consequently sidestepped in this body of theory (Section 2, “Some Basic Parables in the MEO”). A consequence of this neglect is that the MEO tends to neglect the role in coordination of management, leadership, routines, capabilities, and shared cognitive categories (e.g., “corporate culture”), except when these can be interpreted as either manifestations of *ex ante* incentive alignment (e.g., HERMALIN [1998]) or *ex post* governance (WILLIAMSON [1996]). While section 3 (“An Austrian Starting Point”) discusses the nature of coordination problems that are “non-standard” in the context of the MEO, section 4 (“Austrian Insights and the Economics of Organization”) discusses what Austrian economics has to offer with respect to insights into economic organization.

It should be emphasized that the ambition of the present paper is not to take steps towards an alternative Austrian theory of the firm. Rather, the ambition is the

¹ For example, KREPS [1996] criticizes the routine assumption in much of the MEO that agents can perform dynamic programming, that is, agents can anticipate expected pay-offs from a relation, even when they have no or little knowledge about the character of the good that they intend to trade (e.g., in an R&D joint venture). And DEMSETZ [1988], HALLWOOD [1997], LANGLOIS and FOSS [1998], and HOLMSTRÖM and MILGROM [1998] have argued that there may be knowledge-based determinants of the boundaries of the firm that are not identified in the MEO.

more humble one of suggesting that Austrian economics is a challenge to the MEO, that economists of organization may derive inspiration from Austrian economics, and perhaps even that some sort of combined research program may be a worthwhile endeavour. Although Austrian economics raises good questions, arriving at satisfactory answers is likely to involve the efforts of more mainstream economists of organization.

2. Contracting and Coordination in the Modern Economics of Organization

This section provides an overview of the basic explanatory structure of the main streams in the MEO, namely the complete and the incomplete contracting approaches.² The purpose of this overview is to identify a number of assumptions about agents' knowledge that are often done as a matter of routine, and which may be defended by pointing to analytical convenience. However, the effect of the making of these assumptions is that a number of issues related to the coordination of knowledge in firms are hard or impossible to conceptualize and address. Among the relevant assumptions are that the best present uses of assets and rights to those assets are known to agents, that the principal knows the full range of actions available and that transactors can perform dynamic programming.

2.1. Problems of Coordination

The overarching theme that runs through all the many and diverse contributions to the MEO is the theme of coordination, reflecting that the broad essence of organization is indeed coordinated response to volatility of whatever type and source. However, the word "coordination" comes with a number of meanings. One meaning that has become prevalent – in fact, almost completely dominant – in the MEO is that of mitigating the effects of incentive-conflicts.³ Thus, incentive-conflicts are ubiquitous and all-important; in contrast, coordination problems that do not turn on incentive conflicts are implicitly taken to be either empirically rare, theoretically trivial or both.

To illustrate, we can in an abstract manner think of economic agents as choosing game forms and equilibria thereof for regulating their trade. Efficiency requires that if agents can find a game form, and an equilibrium thereof, that allows them to do better, they will do so. For example, we may think of two agents that confront the following two possible games, each one being a simple coordination game (WERNERFELT [1994]).

Game 1	Game 2
B	B

² I shall primarily discuss more formal work. This does not reflect that this is necessarily superior to less formal work, such as Williamson's, but rather that the formal work is less guarded and more explicit. For an Austrian discussion of Williamson's work, see SAUTET [1999].

³ Here understood in a broad sense as also encompassing the paradigmatic "hold-up" problem.

	x	y
x	1, 1	0,0
A		
y	0,0	2,2

	x	y
x	1,1	0,0
A		
y	0,0	3,3

In this situation, Pareto efficiency requires that agents choose game 2 and play the (3,3) equilibrium. In such simple situations, problems of economic organization are taken to be absent, because of there aren't any incentive conflicts.⁴ Indeed, many would deny the absence of any real coordination *problems* in games 1 and 2, simply because rational players will have no problems choosing the Pareto-dominant equilibrium (LUCE and RAIFFA [1957, 59]).⁵ However, it is easy to see that a slight modification of pay-offs, as in game 3, may spell trouble.

Game 3		
	B	
	x	y
x	2, 2	0,0
A		
y	0,0	4,1

Game 4		
	B	
	x	y
x	2,2	0,0
A		
y	0,0	4-u,1+u

The problem here is, of course, that the Pareto criterion is too weak to select a unique equilibrium, since both the (2,2) and (4,1) outcome may be equilibria on this criterion. Now, obviously the (4,1) equilibrium has a higher joint surplus than the (2,2) equilibrium, and therefore it will be in A's interest to bribe B to play the y-strategy. If u , the bribe, lies between 1 and 2, the equilibrium corresponding to both A and B playing y will be efficient, and, hence, be chosen. Thus, efficiency now implies that the agents agree on maximizing and somehow splitting the joint surplus. In this situation a market failure occurs when bribes cannot be sustained in equilibrium, something that may be crucially dependent on the timing of the game.⁶

⁴ It may be argued that in the absence of incentive conflicts, the first-best solution is always obtainable, but this can only be claimed if all other coordination problems are already assumed away.

⁵ An assumption that is not warranted; see, for example, COLMAN and BACHARACH [1999].

⁶ For example, if A gives B the bribe before the game begins, B will not choose the y-strategy, which means that A will decide not to give B any bribe. Or, A may promise B to pay the bribe after game, but B will realize that this will not be in A's interest, and will still choose the x-strategy. Although the (2,2) equilibrium is still efficient, it is not joint-surplus maximizing.

Such market failures may often be remedied through contractual means,⁷ but contracts may fail too in the sense that they cannot completely safeguard against the reduction of surplus/loss of welfare stemming from incentive conflicts. This sort of “contract failure” may take various forms.

2.2. Contracting in the Modern Economics of Organization

It is customary in the literature to make an overall distinction between complete and incomplete contract theories, the former category including principal-agent theories and the latter one including transaction cost economics (COASE [1937], WILLIAMSON [1996]) and property rights theories (HART [1995]).

Under complete contracting, the parties can (costlessly) write a contract that describes their actions given all the future contingencies that may influence their contractual relation. In this context, there may be failure to reach the first-best outcome because of asymmetric information and different risk-preferences, but given these constraints (and a specification of the parties’ bargaining power), there is a determinate preferred outcome, on which the parties can coordinate without any problems.

Under incomplete contracting, some contingencies are left out for whatever reasons, such as information costs, the limitations of natural language, etc. For example, in the context of the example above, A may be confronted with a contingency that is not covered by the contract, refuse to pay B the bribe, and B can do nothing about it. Or, while it may be possible for partners to agree on contract terms, these may not be enforceable by a third party, such as a court (i.e., are “non-verifiable”). In these cases, it may not be possible to sustain the first-best outcome, that is, the one that unambiguously maximizes joint-surplus. Since complete contingent contracts cannot be written, parties to a contract may find it necessary to renegotiate their contracts after the contract has been signed, either because they encounter states of nature about which the contract is silent or where the contract specifies inefficient terms (WILLIAMSON [1996]). In the Grossman-Hart-Moore version of this idea,⁸ it is assumed that the outcome of the renegotiation process can be foreseen at the time of drafting contracts and that the process does not involve costly bargaining – hence, is efficient (GROSSMAN and HART [1986], HART and MOORE [1990], HART [1995]). Nevertheless, the very fact of the possibility of renegotiation may be sufficient to cause inefficient levels of investment in relation-specific assets.

This directs analytical attention to property rights, or more precisely residual control rights, that is, the rights to control the use of assets in states of nature that are not described in the contract. The interest then centers on which pattern of ownership rights leads to the most efficient outcome, where this depends on the characteristics of the involved assets (e.g., whether they are complementary), on whose assets are most important to the joint surplus, and on who is most responsive to incentives, since ownership by one of the parties will attenuate the incentives of

⁷ For example, A may agree to pay B a compensation if he does not pay u, or B may agree to pay A a compensation if he does not choose the y-strategy after receiving u.

⁸ If not in WILLIAMSON’s [1985, 1996] story.

the other party. The bottomline is that the efficient ownership arrangements primarily turn on the trade-off between incentives for the buyer and the seller.

2.3. Coordination in the Context of Incomplete and Complete Contracting

The Grossman-Hart-Moore property rights approach has recently given rise to substantial debate within the MEO. For example, it has been argued that property rights are not always necessary for reaching efficient outcomes, but that various cleverly designed mechanisms can handle the problems of unverifiable contract terms, so that one comes back to the complete contracting (principal-agent) tradition (TIROLE [1998]). Relatedly, there has been some uneasiness about the supposedly less rigorous and more *ad hoc* type of modeling that characterizes the incomplete contracts literature relative to the principal-agent literature (MASKIN and TIROLE [1997]).

However, these are, as it were, *internal* debates, and many things are therefore taken for granted and not contested. In the following I shall launch a critique that is more of an external nature, namely one based on an Austrian point of view. To anticipate matters somewhat, it can be argued that the MEO makes a number of strong assumptions about the coordination of economic agents' actions and plans, and how this should be analytically approached. Thus, on the overall level, agents are assumed to be able to coordinate on any desired gameform and equilibrium thereof, subject to constraints such as attitudes to risk, incentive trade-offs, bargaining power, and asymmetric information. Thus, coordination takes place by means of pure ratiocination, and there is no mention of discovery, trial-and-error learning and the like. With respect to the conceptualization of coordination problems, only alignment of incentives is considered. In the context of the examples above, game no. 4 is the ruling paradigm. But surely, we can imagine interesting coordination problems that do not turn on incentive problems and we can surely imagine agents having difficulties coordinating on an equilibrium (CRAWFORD and HALLER [1990]).

From an Austrian point of view, the strong powers of coordinative ability that are ascribed to agents in the MEO are perhaps particularly striking in the context of the literature on contractual incompleteness. Thus, incompleteness is often explained by arguing that although the parties to the contract are symmetrically informed, certain things are not verifiable (in essence shifting the bounded rationality of the parties to the courts). Not only are the agents in a contractual relation symmetrically informed; they are also assumed to be able to foresee the pay-offs from their relation, even if they don't know at all the physical characteristics of the good they are trading (TIROLE [1998]) and even if unforeseen contingencies occur.⁹ Thus, the parties to a contract can correctly anticipate the distribution of

⁹ Of course, the motivation for this assumption is that otherwise the whole theory threatens to fall apart. As MOORE [1992: 180] comments: "If parties cannot foresee certain events, let alone anticipate how surplus would be divided in the event of renegotiation, then how is this likely to affect the size and nature of their specific investments?" (ibid). However, MASKIN and TIROLE [1997] point out that there is a tension between the assumption of dynamic programming and the presence of transaction costs. If agents can in fact perform dynamic programming, then transaction costs (of

utility, but cannot describe the sources of that utility. Of course, this reflects the basic modelling approach of assuming that everything, but for a few variables, is common or shared knowledge.

Often such an approach makes perfect sense. However, at other times it is vulnerable to the critique that HAYEK [1937, 1945] launched against the economics of his day, namely that it assumes from the outset the coordination of activities that it should be the prime task of economists to inquire into.¹⁰ From such a perspective, one may criticize the MEO for assuming that virtually all that is worth discovering has been discovered already. There are a few spanners in the works – all of which are only related to misaligned incentives -- but there is no genuine knowledge problem of the sort that Hayek talked about.¹¹

The bottomline is that in the MEO, knowledge is not truly dispersed and coordination problems are trivialized. One may press the claim that the MEO has not fully absorbed a main messages of the socialist calculation debate (see LAVOIE [1985]): That knowledge is dispersed, subjectively held and tacit, and that there is more to efficient ressource allocation (in socialist economies or firms) than providing managers with the right incentives. There is also the problem of the coordination of knowledge, which is not necessarily an incentive issue. The following section develops these Austrian critiques further.

3. An Austrian Starting Point

In this section, I clarify the ways in which an Austrian approach differs from a more mainstream approach, and how it challenges the MEO. I also argue that Austrian economics focuses on “non-standard” coordination problems that go beyond those considered in the MEO.

3.1. Austrian Subjectivism

describing actions or the nature of goods in advance) will not restrict the set of outcomes that contracts can implement.

¹⁰ Relatedly, FURUBOTN and RICHTER [1997, 442] criticize the modern mainstream modelling approach on the grounds that it portrays decision-makers as having “... split economic personalities. They are perfectly informed about some matters yet completely ignorant about others”.

¹¹ For example, in the following quotation: “The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate “given” resources – if “given” is taken to mean given to a single mind which deliberately solves the problem set by these “data”. It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge which is not given to anyone in its totality” (HAYEK [1945, 77-78]).

Because of some diversity in the school, it is difficult to precisely and briefly summarize what is the essence of Austrian economics (but see O'DRISCOLL and RIZZO [1985], BOETTKE [1994], VAUGHN [1994]). Some hold that the crucial concept is that of "market process" (KIRZNER [1992, 1997]). However, a conceptualization of the market process is likely to be derived from underlying notions of individual behavior (LITTLECHILD [1986]). Accordingly I shall take Austrian economics to be primarily distinguished from mainstream economics by its much more thoroughgoing *subjectivism*. Austrian subjectivism is not only a matter of accepting the subjectivism of preferences; it is a more radical matter of stressing the subjectivity of beliefs, expectations, plans, etc.

This may sound as a banality; it is not. To see this, one may contrast Austrian subjectivism with mainstream (game theory) modelling of agents' knowledge (GEANAKOPLOS [1989], RASMUSSEN [1994], DEKEL and GUL [1997]). In the latter type of modeling exercise, it is assumed 1) that there is an isomorphism between the real world and an agent's image of it, 2) that agents only differ with respect to decision-making capabilities in terms of how fine or coarse their information partitions are, 3) that information partitions are given, and 4) that genuine knowledge gaps, such as mistakes and surprises, can be ruled out. For example, in the standard principal-agent model, the only true knowledge difference between the principal and the agent is that the principal's information partition is coarser than the agent's partition.¹²

In essence, the Austrian perspective is a call for breaking with all four assumptions. For example, in a subjectivist perspective, learning must involve more than Bayesian updating of priors; it must also involve setting up new interpretive frameworks for handling new types of problems. Action – including entrepreneurial action – is mediated by such mental constructs (cf. DENZAU and NORTH [1994]). A subjectivist perspective on action thus implies that the essence of economic behavior is not merely maximizing. It also consists in understanding the environment, making sense of incoming information, and generating procedures which can help solving problems (LACHMANN [1978], CHOI [1993], DOSI and MARENGO [1994]). It certainly includes alertness to hitherto neglected opportunities (KIRZNER [1973, 1992, 1997]), that is, the overcoming of sheer ignorance. Crucially, in the Austrian view the subjectivity of mental constructs, problem-solving procedures, etc. translates into a postulate that such constructs, procedures, etc. differ across agents (BUTOS and KOPPL [1997]). A direct implication is that communication costs are non-negligible in a world of Austrian agents. Another one is that the overcoming of ignorance is an important economic activity. Both implications have further implications for economic organization.

3.2. The Subjectivist Challenge

A response may well be that taking Austrian subjectivism seriously just amounts to introducing unnecessary complication. However, in the perspective of this paper it is exactly by taking a subjectivist starting point that we are able to see and conceptualize problems that are crucial to the understanding of economic organization, but which have

¹² LEWIS and SAPPINGTON [1993] introduce "ignorance" into the principal-agent model, but only in the rather restricted sense of making the agent know as little about a critical parameter as the principal knows.

disappeared from the focus of the MEO. Among these is truly dispersed knowledge. This goes beyond the conventional asymmetric information paradigm to also include the possibility of different ways of mentally representing economic reality and sheer ignorance.¹³ In the Austrian perspective, agents often hold different mental constructs for making sense out of reality, they may be ignorant about what knowledge they are ignorant about (“sheer ignorance”), and they will, therefore, experience unforeseen contingencies. I shall characterize these epistemic conditions as “truly dispersed knowledge”.

Not only can we better see these aspects of knowledge in an Austrian perspective, there is a further constructive dimension to it. Truly dispersed knowledge leads directly to a concern with the coordination of subjectively held and formed plans, and to an appreciation of the institutions – such as firms (MALMGREN [1961]) – that promote the coordination of plan. Moreover, the set of coordination problems is considerably broader than the set considered in the MEO. Thus, at issue is not only the alignment of incentives which is the predominant form that plan-consistency takes in the MEO; it is also a matter of discovery of things hitherto unknown – including discovering the best uses of assets – and of aligning mental frameworks.

Thus, Austrian subjectivism poses a challenge. It does so by radicalizing the Hayekian knowledge problem of how to make best use of dispersed knowledge to go beyond the standard asymmetric information paradigm and also consider sheer ignorance, unforeseen contingencies and differential cognitive frameworks. Applied to the organization of firms, and paraphrasing HAYEK [1945], the subjectivist challenge may be formulated thus: How is rational firm organization possible when we *cannot assume from the outset* that

- all contracting action can be compressed into one initial grand contract, as in the principal/agent paradigm – because of the occurrence of unforeseen contingencies;
- principals know all the possible actions that are open to agents – because of truly dispersed knowledge;
- agents, for example, division managers in a firm, hold the same cognitive constructs – because of different subjective perceptions of reality;
- decision rights are efficiently assigned – because entrepreneurial activity may discover better assignments;
- agents can perform dynamic programming and perfectly foresee their pay-offs (or at least the distribution thereof) – because of the occurrence of novelties;
- that all present uses of all assets, including the optimal ones, are known to economic agents – because entrepreneurial activity may discover better uses;

¹³ As KIRZNER [1997] carefully explains, sheer ignorance goes beyond asymmetric information in that the latter essentially assumes that agents know what they are ignorant about (and can search to reduce their ignorance), whereas the former implies that agents are not aware of what it is that they are ignorant about. Discovering such hitherto unthought-of knowledge is bound to produce surprise.

- we can pay lip service to issues of communication – because Austrian subjectivism implies the presence of non-negligible communication costs,

but must think of these as either non-permissible abstractions (e.g., the complete contracting assumption) or as *explananda* rather than data (e.g., the efficient assignment of decision rights, the optimal use of assets).

In short, the subjectivist challenge consists in portraying coordination problems as a good deal more complicated and messy than they are normally portrayed in the MEO. In the latter, attention is focused on situations where everything is coordinated, but for a few variables or relations. For example, in the canonic principal-agent set-up, the principal knows the range of courses of action that is open to the agent, his preferences and the probabilities distribution of the stochastic variable that impinges on the agent's output. His basic problem is that he cannot observe the agent's effort and Nature's move. However, he is able to design a second-best incentive scheme (at no contracting cost). More generally, all the best present uses of all assets are known to the parties; what may be uncertain is the future use of these assets when unexpected contingencies emerge (Kirsten FOSS [1999]), but even this can be cast in an equilibrium mould, as in the Grossman-Hart-Moore approach. Thus, in virtually all of the MEO, knowledge is not truly dispersed.

3.3. Coordination Problems and Knowledge Problems

A proponent of the MEO may argue that not only are the above complications far-reaching and hard to model, they may also be unnecessary. In many realistic settings (small firms and partnerships?), coordination problems indeed reduce to giving people who already are on “the same wavelength”, as it were, the right incentives – that is, the problem studied in virtually all of the MEO. This may be granted, and it bears repeating that the purpose here is not to attack the MEO *per se*. There is much to admire in this body of theory, but what should be kept in mind is its limited nature. Thus, we may certainly make the routine assumptions that are made in the MEO, provided we keep in mind that making them is only a first step.

In the perspective taken here, the MEO is, however, likely to lead attention away from coordination problems that do not necessarily involve problems of incentive alignment. To repeat, there are (many) coordination problems that go beyond the simple paradigmatic one portrayed in game no. 4 above, and the Hayekian knowledge problem (HAYEK [1945]) is one such problem. For example, we can have a completely simple symmetric coordination game (game no. 5):

Game 5

		B	
		x	y
x		2, 2	0, 0

A

y 0,0 2,2

It is well-known that there is nothing in classical game theory to help us predict the outcome in this situation,¹⁴ and that one has to rely on *ad hoc* constructions – such as focal points or appeal to mediators (SCHELLING [1960, 144]) – for rationalizing any particular outcome. One may of course argue that such arbitrariness can an advantage rather than a problem – for example, it may help us make sense of, for example, firm heterogeneity¹⁵ – but that is not the point here.

The normal form games 1-5 have been made extremely simple on purpose, because nothing more is required to illustrate some basic points about game theoretic modeling in the MEO (see also KREPS [1996]). Most notably, game theory representations tend to obscure some rather fundamental questions in order to analyze well-defined situations. Among these questions are, How do players come to know the pay-offs? Or each other? Or the available strategies? Will they hold the same views of the pay-offs? Of each other? Of the available strategies? How, do they know which game, and type of game, they play? Such questions are suppressed by assuming from the outset that players have commonly known, identical beliefs about all other players' strategies, and that those beliefs are consistent with some equilibrium in the game.¹⁶ Given this the analyst then proceeds to examine the design of incentive schemes, the sharing of the surplus from a relation, the support of certain outcomes by implicit contracts, etc. However, this is not unproblematic for the basic reason that a number of real difficulties of coordination have been shunted aside.

One may press the claim that much of game theory is characterized by the conflation of what objectively exists and what is subjectively perceived that Hayek criticized so strongly more than six decades ago in his discussions of the coordination problem in economics (HAYEK [1937]). Ironically, one possible reason for the strong upsurge in the popularity of game theoretical models in the last 10-15 years may have to do with these models being perceived as solving the coordination problem: Agents reason (instantaneously) their way to equilibrium (GUESNERIE [1992]). But as we have seen (cf. game 5), this is not always possible. And more generally, the coordination problem of course isn't solved at all, merely side-stepped.

While an “eductive” (BINMORE [1991]) approach may have some plausibility for simple non-symmetric coordination games with few players,¹⁷ it becomes

¹⁴ For example, the usual refinement techniques are not helpful here.

¹⁵ Firms all play game 5 but choose different equilibria.

¹⁶ There are exceptions, such as CRAWFORD and HALLER [1990] and HUYCK, BATTALIO and BEIL [1990].

¹⁷ However, even in very simple interaction situations, coordination failure may arise (see HUYCK, BATTALIO and BEIL [1990] for experimental evidence).

increasingly implausible as we increase the number of available strategies, players, and equilibria. And while we also know that when simple pure coordination games are repeated, the players will, through trial and error, eventually coordinate on an equilibrium (CRAWFORD and HALLER [1990]), in a more realistic setting, the game itself may change during play. For example, the players may discover some “particular circumstances of time and place” (HAYEK [1945]) that affect the pay-offs and require that they restart play. Both when the number of players expand and when the presumed “data” of the game change, we increasingly confront the Hayekian knowledge problem of how to coordinate truly dispersed knowledge. To some extent, however, the Hayekian knowledge problem is alleviated by the presence of numerous, largely spontaneously grown, institutions – a theme intimately connected with Hayek’s own work (e.g., HAYEK [1973]) (see also SCHLICHT [1998, 260-262]). It is such insights, I submit, that may be applied to understanding firm organization.

To anticipate this somewhat, consider the case of the multi-divisional form, or “the M-form”. While CHANDLER [1962] in his early analysis had argued that information overloads on the part of top-management under the U-form explained the adoption of the M-form, the economic analysis of the M-form is cast almost entirely in terms of aligning incentives. For example, MASKIN, QIAN and XU [1998] argue that different organizational forms give rise to different information about managers’ performance and therefore have different implications with respect to the effectiveness of incentives. The M-form will become adopted because under certain conditions it promotes relative performance evaluation better than the alternatives.

However, another – Austrian-style – interpretation is possible (SAUTET and FOSS [1998], SAUTET [1999]). In this story the advantages of the M-form have more to do with the knowledge-related advantages of changing the internal division of labour. Rather, than focusing on the information overload that top-management confronts, an Austrian perspective focuses on the knowledge that is dispersed in the corporation and which management cannot possibly centralize. The M-form is one way of coping with this knowledge-dispersal problem (SAUTET [1999]). This is because it allows decentralized decisions to be made in an efficient manner, and frees top-management of daily operational control, so that they become more able to specialize in overall strategic judgment. The reason for the existence of the M-form is thus not information overload but rather that it is an organizational structure that allows top-management to cope with the problem of dispersed knowledge.

4. Austrian Insights and the Economics of Organization

Austrian economics is normally taken to be first and foremost a theory of the *market* process (KIRZNER [1997]). In contrast, it is not seen as containing a theory of the firm, and one seeks in vain for any details about firm organization in the Austrian literature.¹⁸ A basic reason for this neglect is easy to discern: In the view of the

¹⁸ Most work on the theory of the firm with an Austrian flavor has been done by “fellow-travellers”, for example, LANGLOIS [1995] and LOASBY [1991]. However, recently, younger Austrians have begun to apply Austrian ideas to the theory of the firm, for example, (Peter) KLEIN [1996], COWEN and PARKER [1997] and SAUTET [1998].

Austrians, economics – and social science in general – is about tracing the unintended consequences of intentional human action (HAYEK [1952], LACHMANN [1978]). And in the view of the Austrians, unintended consequences are only manifest in large-scale, complex systems characterized by a substantial division of knowledge, notably whole economies. Smaller scale systems, such as firms, have no room for unintended consequences and are therefore not a proper domain of inquiry for the economist.

Bearing in mind that this is a rational reconstruction, one may argue that a problem with this Austrian view is that we are never being told *when* a social system is so large that it is sufficiently complex to produce non-trivial unintended consequences. Moreover, perhaps because this is not made clear, it is not fully recognized that firms may manifest a substantial division of dispersed knowledge, and that organizational forms may reflect attempts to grapple with the coordination problems introduced by dispersed knowledge. As this suggests, there is in fact a potential for applying key Austrian ideas on the organization of the process of knowledge utilization and creation. The following sections discuss some of these ideas.

4.1. Firms and the Dispersal of Knowledge

In contrast to markets, firms are planned by identifiable historical individuals with the purpose of earning a profit and they normally operate under a designed framework, such as a mission statement, a formal organization structure, etc.¹⁹ Firms are set in motion, as it were, by conscious intention and are therefore “pragmatic” institutions in the sense of MENGER [1883]. However, the distinction between “pragmatic” and “organic” systems really only refers to the *origins* of these systems. Thus, systems with an organic origin may become heavily regulated, and systems with a pragmatic origin may develop spontaneous elements (LANGLOIS [1995]).

To the extent that such spontaneous phenomena are treated in the MEO, they are cast in a somewhat negative light; for example, they tend to be placed under the rubrics of rent-seeking, sub-goal pursuit, on-the-job-consumption, etc. In the MEO, equilibria of decentralized firms are thus taken to be inefficient because of various conflicts of interest among the decision-makers within the firm. Given this, attention turns to the design of various devices, such as Groves-Vickrey-Clarke mechanisms (GROVES and LOEB [1979]), which may remedy incentive conflicts.

From an Austrian point of view, it is striking that the MEO has focused almost exclusively on the negative aspects of decentralization, that is, to the extent that it has treated decentralization in organizations at all.²⁰ Large firms may confront knowledge dispersal problems of a magnitude comparable to those that confront the social planner in a socialist economy (GHOSHAL, MORAN and ALMEIDA-COSTA [1995]). Clearly, such a dispersal of knowledge may be unavoidable, for example, because attempts to put all tacit dispersed knowledge in the hands of top-management may be exceedingly

¹⁹ VANBERG [1994] talks in this connection of the firm’s “constitution”.

²⁰ However, the works of Masahiko AOKI [e.g., 1990a,b] and, to a smaller extent, RADNER [1993], are outstanding exceptions to this.

costly (JENSEN and MECKLING [1992]), accompanied by information loss (WILLIAMSON [1970]) and perhaps impossible (LAVOIE [1985]). Moreover, even assuming that all dispersed knowledge could in fact be centralized, there is of course no guarantee that top-management would be competent to efficiently utilize the knowledge (PELIKAN [1993]).

Not only is dispersal of knowledge in firms unavoidable; there may also be a beneficial aspect to it. HAYEK [1945] stressed that economic problems only arise as a consequence of change, particularly unforeseen contingencies. One may argue that the MEO to some extent incorporates this Hayekian point *via* its emphasis on incomplete contracts, renegotiation, *ex post* governance and so on. However, the Hayekian point that decentralization is an effective response to the local emergence of unforeseen contingencies²¹ is either neglected or given a static mechanism design interpretation.

Hayek's point appears to have been that an economy with alienable property rights promotes a tendency towards allocating property rights to those who can make best use of them and in this way makes sure that the best use possible is made of dispersed knowledge.²² However, as JENSEN and MECKLING (1992) point out, this reasoning makes it hard to account for the existence of firms; why not have complete decentralization?²³ Suppose firms existed. We then know that management will generally not be able to centralize all dispersed knowledge inside the firm. An implication is that employees will not only have less coarse information partitionings than their bosses – they will quite simply know and discover things about which their bosses have no idea.²⁴ Therefore, they may arrive at different conclusions as to how certain events that influence firm profitability firm should be handled. This in turn implies a powerful argument for extensive decentralization of control rights, and an argument against direction, since the latter normally presumes that the principal possesses knowledge that is superior to that of the agent (DEMSETZ [1988], CASSON [1994]). But why then have firm organization? Driven to its extreme, an emphasis on dispersed knowledge may easily leads to a denial of the need for firms.

²¹ To quote Hayek directly: "If we can agree that the economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to the people who are familiar with these circumstances, who know directly of the relevant changes and of the resources immediately available to meet them. We cannot expect that this problem will be solved by first communicating all this knowledge to a central board which, after integrating all knowledge, issues its orders" (HAYEK [1945, 83-84]).

²² This point has been reflected in much recent management thinking (SEMLER [1989], MEYER [1994]; NONAKA and TAKEUCHI [1995]). The recent strong emphasis on cross-functional teams that are given extensive decision rights and where payment is based on team-output reflects the recognition that it is to some extent possible to combine "high-powered" incentives with efficient utilization of local knowledge in firms.

²³ Indeed, in some recent, and explicitly Austrian, work on these issues, the very distinction between firms and markets is argued to be insubstantial (COWEN and PARKER [1997]). According to these authors, the coordination problems solved by firms and markets are essentially similar, and firms cannot realize production possibilities that cannot be realized by markets.

²⁴ As SAUTET [1999] points out, management therefore confronts a "double Hayekian knowledge problem": it is not just that it doesn't know what it doesn't know in the *market*; it is also the case that it doesn't know what it doesn't know about the firm's *employees*.

Of course, we know from the MEO that for all sorts of reasons the benefits from efficient utilization of dispersed knowledge may be swamped by the incentive conflicts attendant on a decentralization of decision rights. Indeed, the MEO has emphasized these conflicts to such an extent that while it may provide strong reasons why control rights in firms should be centralized, it has a hard time explaining why (some) control rights should ever be decentralized. However, even if we suppress such incentive conflicts, we are not necessarily led to the conclusion that firms will not exist. I shall argue that this conclusion is too hasty, and is likely to only hold true (if at all) in a static context. In a dynamic context – which is the setting that interests Austrians – firms may have distinct advantages relative to markets in terms of their planning ability. Given that a main message of Austrian economics is that there are strong inherent limitations to planning, this may indeed seem to be a strange conclusion to reach in a paper with an Austrian orientation. However, there are different meanings of planning, and some of these are fully compatible with an Austrian point of view.

4.2. Types of Coordination and Planning

As we have seen, HAYEK's [1945] discussion of spontaneous coordination by means of the price mechanism and alienable property rights may lead to a denial of the need for planning. But here it is pertinent to remember HAYEK'S [1944] famous quip that the issue is not planning versus no planning but rather who should do the planning. Furthermore, as KLEIN [1997] reminds us of, there is a sense of the word "coordination" that is different from the sense in which HAYEK [1945] used it. This may be best associated with the work of SCHELLING [1978] (or with much of recent game theory work on coordination games). Here coordination is typically smaller scale than in the market settings discussed by Hayek; moreover, it is intended and desired by the interacting parties. At one extreme, coordination takes place in a completely unintended manner; at another extreme, it is intended, and possibly a product of pure ratiocination.

We may illustrate these two extremes by referring to two different overall modeling strategies in the theory of the firm. One of these is to model the firm as an adaptive network (e.g., DOW [1990]). In this modeling approach, agents in a network initially do not know what they and others are doing, but fall back on naive adaptive learning procedures. Over time they may home in on some sort of equilibrium (absorbing state or the like) consisting of stable decision rules. This equilibrium is then interpreted as an organization (e.g., as in MARCH [1988]). The other modeling approach is that favored by the MEO. In its mechanism design guise, this rational design approach implies that the codes and rules that coordinate local decisions and plans are designed by top-management. In other words, management is presumed to know the basic game(s) that is (are) being played and can rationally influence its (their) outcome(s) (e.g., HURWICZ [1972]).

From an Austrian point of view, none of these modeling strategies seem very attractive. The basic problem with the rational design approach is that the designer needs to undertake much pre-play communication in order to establish the optimal codes and decision rules²⁵ – which runs counter to an Austrian emphasis on dispersed

²⁵ Technically, he must know the complete range of possible realizations of the agent's private information.

knowledge. The basic problem with the adaptive network approach is that it completely does away with the intentional and hierarchical elements that we know characterize real-world firms. Thus, while the former strategy suffers from a “pretense of knowledge” (HAYEK [1974]), the latter plays down rationality too much. Both suppress the entrepreneurial process of discovery by assumption.²⁶

The Austrian perspective suggested in this paper implies that coordination in firms is intermediate between these two extremes. The fact that that fully informed and detailed top-down planning that incorporates all dispersed knowledge in a firm is not possible does not mean, of course, that firms cannot be characterized by some measure of planning. Note that many firms actually regularly carry out strategic planning exercises, and continue to do so, which to the economist suggests that such exercises on average influence firms’ returns positively.²⁷ What may be the source of that value? Although not all dispersed knowledge can be fully revealed, a regular strategic planning exercise may still update management’s knowledge. Thus, it may become more informed about what sort of knowledge is present in the organization, which learning processes are going on locally (say, in a foreign subsidiary), and which knowledge and practices may profitably be transferred to other parts of the organization.²⁸ These activities may all influence returns positively.

4.3. *Planning and Uncertainty*

From an Austrian point of view, the dispersal of knowledge is not the only obstacle to successful, comprehensive planning. Another one is radical uncertainty (WISEMAN [1953]), which I will here interpret to refer to the emergence of unforeseen contingencies. That unforeseen contingencies matter for the understanding of contracts, governance structures and even constitutions has been a recurrent theme in the MEO for quite some time (WILLIAMSON [1985], GROSSMAN and HART [1986], KREPS [1990], DEKEL, LIPMAN and RUSTICHINI [1998]). However, unforeseen contingencies *per se* are seldom modeled. This is not surprising, since they raise some very basic problems: Does it make sense to claim that economic agents can “anticipate the unanticipated”? If the efficiency of a governance structure depends on how well it copes with unforeseen contingencies, how can agents choose an efficient governance structure on an *ex ante* basis? These problems are central to the understanding of, for example, the efficiency hypothesis in transaction cost economics (WILLIAMSON [1996]) or the assumption in the incomplete contract approach that agents can perform dynamic programming (MOORE [1992], KREPS [1996]).

²⁶ Furthermore, none of these modeling strategies tell us much that helps us to discriminate between different types of coordination and planning; in principle, the adaptive networks and the mechanisms identified in the two approaches may refer equally to the intra-firm or the inter-firm level.

²⁷ Admittedly, strategic planning may have fallen somewhat out of favor relative to its heydays in the 1960s and 1970s. However, the type of planning that has fallen out of favor is precisely the detailed, top-down planning, so strongly criticized by MINTZBERG [1994].

²⁸ Indeed, there is a strong argument that it is precisely the ability to transfer at low cost successful practices that gives multinational firms a competitive edge not only over domestic firms but also over the market (BARTLETT and GHOSHAL [1989]).

It has been a recurring theme in the Austrian tradition that rationality and unexpected contingencies are not mutually exclusively. Thus, MENGER [1871] stressed the holding of reserves in various forms as rational behavior in the presence of unforeseen contingencies. And HAYEK [1945, 82] argued that in the absence of unforeseen contingencies, the task of “... drawing up a comprehensive plan governing all economic activity would be much less formidable” and that “... economic problems arise always and only in consequence of change”. In Hayek’s view, decentralization was one, society-level, response to unforeseen contingencies. This is related to LACHMANN’s [1971, 81] discussion of the limits of social engineering:

In a society in which it is generally known that frequent change of undesigned institutions is inevitable, the designers of designed institutions may deliberately confine their activity to designing a framework which leaves room for a good deal of change ... In such a society it might be said that the undesigned institutions which evolve gradually ... accumulate in the *interstices* of the institutional order. The interstices have been planned, though the sediments accumulating in them have not and could not have been.

Thus, unforeseen contingencies are a challenge to constitutional design. However, the problem remains of how one can meaningfully speak of anticipating the unforeseen, a problem that must be addressed to the extent that we wish to claim that economic agents can rationally choose contracts, governance structures or constitutions that help them adapt to unforeseen contingencies.

LANGLOIS [1986] discussed a similar problem in a splendid but neglected paper. He argued that the crux of the matter is that most events have both foreseeable and unforeseeable aspects, or that they have “typical” and “unique” features (LANGLOIS [1986, 182]).²⁹ Typification is an important aspect of the way in which agents perceive their environment (O’DRISCOLL and RIZZO [1985]). Typical features are those elements of the environment that are stable and unique features are non-repeatable and idiosyncratic. While we can often clearly foresee typical features, we often also have to let time pass before we can fill in the unique features (see also DEKEL, LIPMAN and RUSTICHINI [1998, 524]). As COASE [1937, 21; my emphasis] explained this is indeed the essence of the employment contract:

It may be desired to make a long-term contract for the supply of some article or service ... Now, owing to the difficulty of forecasting, the longer the period of the contract is for the supply of the commodity or service, the less possible, and indeed, the less desirable it is for the person purchasing to specify what the other contracting party is expected to do ... Therefore, *the service which is being provided is expressed in general terms, the exact details being left until a later date* ... When the direction of resources ... becomes dependent on the buyer in this way, that relationship which I term a “firm” may be obtained.

²⁹ The latter terminology derives from the philosopher-sociologist, Alfred Schütz. See also BUTOS and KOPPL [1997] for an interesting Austrian discussion of expectations.

This suggests that the distinction between typical and unique features of events may be relevant to understanding economic organization. The following section pursues this theme further.

*4.4. Coherence and Flexibility: The Firm in a World of Radical Uncertainty*³⁰

Dividing events up in typical and unique features may be a general way of approaching unforeseen contingencies and one that allows us to understand why agents may, after all, be able to rationally choose contracts and governance structures on an *ex ante* basis. For example, agents may entertain the expectation that in this particular type of relation, such and such types of contractual problems typically take place unless the right safeguards are built into the contract, but they do not have to be able to anticipate precisely which contractual problems might arise. Something similar is the foundation of KREPS' [1990] theory of corporate culture. Kreps argues that firms may develop implicit contracts that align incentives by signaling to employees that management will not opportunistically take advantage of them in the case of unforeseen events, although nothing specific is being said (or can be said) about the event. However, we can certainly think of such typification taking place inside firms quite independently of considerations of incentive conflicts. Thus, coordination problems are strongly reduced if employees categorize emergent contingencies in the same way so that the "convergence of expectations" that MALMGREN [1961] saw as a primary benefit of firm organization may be realized (CREMER [1990]). The firm may indeed be characterized by plan consistency (HAYEK [1937], MALMGREN [1961]), but only of a sort that relates to the typical features of events (cf. O'DRISCOLL and RIZZO [1985]).

We may now suggest that an important aspect of what a firm's leaders can do is to do with influence and steer the development of schemes of typification that are flexible enough to accommodate unforeseen events, and that help agents coordinate their interdependent activities. If that is an essential part of what a firm's leaders do, it is potentially misleading to portray these activities in terms of simple situations of interaction as those portrayed in games 1 to 5. It is more true to say that leaders often define what is the relevant game and the feasible strategies, communicate the pay-off structure of the relevant games, and determine which strategies that should be played in the face of an emergent event. It is often as much a matter of defining what are the relevant problems and of providing solutions to these as it is to induce agents to choose the right actions. There are both cognitive qualities and incentive aspects to coordination problems. For example, the problem of adapting to an unexpected event has the cognitive dimension of categorizing and interpreting the event, and it may also have the incentive dimension of avoiding that one of the parties to a contractual relation utilizes the unexpected contingency to effect a hold-up.

Many real-life coordination problems are likely to contain such a mix, and the various problems may to some extent be thought of as hierarchical.³¹ As CALVERT

³⁰ Apologies to LANGLOIS [1986].

³¹ See also HAYEK [1973] for the idea that coordination problems and the institutions that solve them have a hierarchical character.

[1992: 12] points out, the ongoing interactions of real life – for example, inside large firms – are not simple repeated games. There is unlikely to be an exact correspondence between players, strategies and outcomes in various “repetitions” of “the game”, and players are likely to have incomplete (or none at all) information about other players, previous plays, etc. In this situation, there is likely to be multiple equilibria, but, unfortunately, behavior that is appropriate for play in one equilibrium may be inappropriate for another equilibrium; equilibrium strategies are not interchangeable. The problem of selecting the right equilibrium is, in a sense, a higher-order coordination problem.

We may in an abstract way think of the activities of the firm’s leaders as a matter of solving such higher-order coordination problems. They may do so by direct intervention or influencing the formation of typifications that assist the coordination of actions and expectations. However, both incentive problems (cf. WILLIAMSON [1985, chapter 6]) and the knowledge dispersal inside firms mean that the top-manager’s task is inherently rather circumscribed. It is mostly a matter of choosing the right interstices. To quote LACHMANN [1971: 13] again:

[T]he central problem of the institutional order hinges on the contrast between coherence and flexibility, between the necessarily durable nature of the institutional order as a whole and the requisite flexibility of the individual institution ... the relative immutability of some institutions is always a necessary prerequisite for the relative flexibility of the rest.

To optimally combine “relative immutability” with “flexibility” is indeed a “central problem” not only of the design of an institutional order, but certainly also of organization design (cf. also MARCH [1988]). For example, problem-solving capability (“flexibility”) may be supported by a shared understanding (“relative immutability”) of the nature of the businesses the firm is in, such as may happen when corporate mission and vision statement become not only “corporate” but also “personal”.

4.5. Economic Organization

Arguably, the main issues in the MEO are the issues of the existence, boundaries and internal organization of firms. We have seen that an Austrian perspective may have something to say, albeit on a very abstract level, about internal organization. But what about the remaining issues.

With respect to the issue of the existence of the firm, an Austrian perspective suggests to cast this in terms of coordination in dynamic environments, for example, environments characterized by unforeseen contingencies.³² Although much of the

³² LOASBY [1976, 134] long ago argue that we should in fact look to emergent events in order to find a rationale for the firm. “The firm exists”, he explained, “ because it is impossible to specify all actions, even contingent actions in advance; it embodies a very different policy to emergent events. Incomplete specification is its essential basis: for complete specification can be handled by the market”. Unfortunately, Loasby did not make clear why markets cannot handle “incomplete specification”.

argument in favor of market turns precisely on the ability to adapt to unforeseen contingencies, there are certain types of activities that may be hard to coordinate over the market in the presence of unforeseen contingencies. As RICHARDSON [1960] suggested markets often have difficulties handling emergent events in the context of complementary activities. Of course, on the abstract level, this has been a recurrent theme in the MEO (e.g. HART [1995]). However, here the problems are seen to stem from incentive conflicts; it is the mutual hold-up threat that is the problem. In contrast, Richardson held a coordination perspective: Under market relations and in the absence of communication (i.e., infinite communication costs) and forward markets, agents wouldn't have a clue about how to coordinate their actions. Planning, for example, in the form of collusion, might handle the coordination problem.

Richardson's argument may be generalized to cover planning inside firms and positive (but finite) communication costs, so that firm organization may be a communication cost minimizing governance structure for certain types of transactions.³³ More generally, it may be suggested that firms can exercise a degree of "directedness" that is not in general available to markets (FOSS [1997b]). Although there are strong knowledge-related constraints on the type and amount of planning and intervention that top-management can engage in, it still possesses the right to control adaptation to unforeseen contingencies, to delegate decision-making rights, to evaluate units, and to implement new strategies. All of this may be less costly to accomplish inside a firm because, as we have seen, firms can develop certain typifications or cognitive constructs that are shared among the firms' employees.

With respect to the issue of the boundaries of the firm, intuitively, there is much in Austrian economics that is helpful for understanding this issue.³⁴ Thus, the very idea that knowledge is dispersed inside firms suggests that there are limits to the size of firms that turn on the costs of centralizing dispersed knowledge (cf. also COASE [1937], WILLIAMSON [1970]). Moreover, the idea that firms may be differentiated in terms of the dispersed knowledge they contain and the typifications and rules they develop to handle the attendant coordination problems has implications for the issue of the boundaries of the firm. For example, firm-specific knowledge implies the presence of communication costs between firms that may influence the make-or-buy decision (LANGLOIS and ROBERTSON [1995], HALLWOOD [1997], Kirsten FOSS [1999]).

Thus, Austrian ideas do have implications for economic organization, although these have only been sketched here in an extremely intuitive fashion. Moreover, Austrian ideas link up with established insights of both a mainstream and a not so mainstream character. The following section briefly surveys a few recent developments in the MEO that have a bearing on the issues that interest Austrians.

³³ See WERNERFELT [1997] for an attempt to explain the employment contract along such lines, and LANGLOIS and ROBERTSON [1995] for an ambitious attempt to address economic organization issues in terms of how well firms handle change relative to markets.

³⁴ Thus, ROTHBARD (1962) and KLEIN [1996] draw on MISES' [1949] analysis of economic calculation to argue that the firm's boundaries are partly determined by the increasing calculational problems it encounters as it internalizes more and more markets.

Linking up with these recent developments may help Austrians address the issues of economic organization that their perspective naturally raises, such as, How do we model the knowledge-based determinants of economic organization? How can we make room for entrepreneurship in firms? How does incentives and the use of knowledge interact in firms? How should we model truly dispersed knowledge? What is the role of rules in firms and how should their emergence be modelled?

4.6. *Austrian Economics, the Firm, and Recent Advances in the MEO*

According to the line of reasoning pursued in this paper, it is possible to carve out a niche for a distinct Austrian perspective on economic organization. Table 1 maps alternative approaches within the MEO and suggests that the niche carved out for Austrian economics relates to the inclusion of (truly) dispersed knowledge.

TABLE 1
Mapping alternative approaches to the theory of economic organization

KNOWLEDGE				
COORDINATION		Symmetric	Asymmetric	Dispersed
	Incentive conflict	<i>The property rights approach</i>	<i>Principal/agent theory</i>	<i>The Austrian theory of the firm</i>
	No incentive conflicts	<i>Arrow-Debreu contracting</i>	<i>Team theory</i>	

Thus, an Austrian perspective is distinctive by asking questions related to truly dispersed knowledge that have not so far been comprehensively addressed in the MEO, even if they may not have been entirely neglected (e.g. DEMSETZ [1988], KREPS [1990], JENSEN and MECKLING [1992], MINKLER [1993], AGHION and TIROLE [1997], DEKEL, LIPPMAN and RUSTICHINI [1997], WERNERFELT [1997]). Now, Austrian economists may be better at asking questions than at providing answers – at least of the sort that will satisfy the mainstream economic theorist. Austrians may not care much about this, invoking their own standards of scientific excellence. However, there seems to be an opportunity for Austrians in linking up with some recent developments in the MEO, because these have begun treating issues that are close, if not identical, to key Austrian ideas.³⁵

For example, AGHION and TIROLE [1997] argue that real authority (effective control over decisions) in a firm depends on the structure of information existing in that firm which in turn is determined by the exercise of formal authority (the formal

³⁵ Die-hard Austrians may argue that this work is still mainstream in its nature, because it of its predominant emphasis on coordinated states and optimizing behavior. And they are right, but the point here is that, in spite of the shared emphasis on optimization, etc., some mainstream work is surely closer to Austrian ideas than other mainstream work.

right to decide). If agents obtain more real authority, their initiative is promoted (consistent with HAYEK [1945] and KIRZNER [1973]), but there is also an agency problem stemming from the principal's loss of control. There is a similar thrust to JENSEN and MECKLING's [1992] analysis of the optimal co-location of knowledge and decision rights, which, they argue, is determined by the trade-off between effective use of dispersed knowledge and the agency problem. Thus, these contributions go a long way towards examining the interplay between knowledge and incentive problems in firms.³⁶

The team-theory tradition initiated by MARSCHAK and RADNER [1972] goes some way to represent the problem of communication when it is necessary to make use of dispersed knowledge and yet some coordination of decision-makers is required (RADNER [1993]). Thus, BOLTON and DEWATRIPONT [1994] model the firm using the idea of an information network in which each agent handles a particular type of information, and the different types of information are aggregated through the network. When the benefits to specializing outweigh the costs of communication, teams (firms) arise. Much of AOKI's [e.g., 1990a,b] and CASSON's [e.g., 1994] work also belong to the small sub-group of contributions to the MEO in which incentive conflicts are suppressed, and knowledge considerations take center-stage.³⁷ This kind of work clearly helps addressing the Austrian issue of how to optimally handle dispersed knowledge in an organization.

However, there are many questions that the Austrian perspective raises which are not dealt with by the MEO. Notably, how should truly dispersed knowledge be modelled? The complete contracting paradigm seems to be inadequate for handling this, particularly if neither the principal nor the agent fully know the latter's action set *ex ante*. In that case, both may be surprised *ex post*, and some flexibility in the form of contractual incompleteness may be rational. In the market, entrepreneurial processes of discovery, stimulated by the lure of pure arbitrage opportunities, tend to eliminate pockets of ignorance (KIRZNER [1997]). How do firms stimulate similar discovery processes? May incentives in firms also stimulate entrepreneurial processes of discovery (cf. SAUTET [1999])? If so, how are such incentive best designed? Indeed, what is the meaning of efficiency in the presence of truly dispersed knowledge?

Firm-specific conventions and communication codes and the like also reduce the coordination problems stemming from dispersed knowledge, just as the "rules of just conduct" that characterize "the great society" do (HAYEK [1973]). How should we model the emergence of these conventions and codes?

Of course, we have partial answers to such questions. For example, the emergence of firm-specific conventions and norms may be modelled as iterated coordination games. And although monitoring is likely to be inefficient in general as solutions to principal-agent problems involving ignorance, profit sharing may be one

³⁶ However, the only contribution within the agency framework known to this author that grapples with truly dispersed knowledge (sheer ignorance) is MINKLER [1993].

³⁷ AOKI and DORE [1994] is a fascinating account of how in practice Japanese firms handle knowledge dispersal problems.

way of making a less ignorant agent work in the interests of a more ignorant principal (MINKLER [1993]). But there is a long way to go before the MEO will fully come to grips with the issues raised by Austrian insights in the dispersal of knowledge.

5. Conclusion

“If I have ... shown not only that the answer to this question [of how knowledge is coordinated] is not obvious but that occasionally we do not quite know what it is, I have succeeded in my purpose” (HAYEK [1937, 56])

The aim of this paper has been to apply a well-known Austrian theme – that of dispersed knowledge – to a somewhat unusual context, namely firm organization and theories thereof. I have argued that much of the MEO can be criticized by means of much the same arguments that were employed by HAYEK [1937, 1945, 1946] in his classic critique of economics. Thus, truly dispersed knowledge is suppressed in the MEO.

From a model-building point of view, it may be claimed that there are good reasons for suppressing dispersed knowledge and other Austrian themes because we are dealing here with hard-to-model phenomena. All who have invested resources in familiarizing herself with contract theory will know how even seemingly simple interaction situations can lead to rather mind-boggling complications. Better then to forget about all the seeming additional mess introduced by the Austrians. In response, one may argue that Austrian issues, such as dispersed knowledge, entrepreneurship and emergent rules, certainly are in fact given to formal modeling (e.g., LITTLECHILD and OWEN [1980]). The problem is not that they cannot be modeled. It is rather that most modern economists of organization follow a methodological convention that dictates a very specific and arguably narrow modeling heuristic – that literally all issues of economic organization must be cast in the incentive-conflict mold – to the exclusion of alternative modeling heuristics. However, I have suggested that economists of organization may be gradually transcending this narrow modeling heuristic. There are signs of an increasing interest in issues of communication, organizational codes, unforeseen contingencies, etc. Perhaps in this way Austrian insights may make their way back into the MEO.

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