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Michael Dietrich, Jackie Krafft

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Michael Dietrich[°] and Jackie Krafft[*]

[°]University of Sheffield, Department of Economics, 9 Mappin Street, Sheffield S1 4DT (United Kingdom), Tel: + 44 114 22 23416; Fax: + 44 114 22 3458; Email: m.dietrich@sheffield.ac.uk

[*]University of Nice-Sophia Antipolis, GREDEG-CNRS, 250 rue Albert Einstein, 06560 Valbonne (France), Tel: + 33 4 93 95 41 70, Fax: + 33 4 65 37 98; Email: Jackie.Krafft@gredeg.cnrs.fr

The authors would like to acknowledge the input from the journal's refereeing process. The comments involved have improved the organization of the discussion and the specific argument.

Abstract

This paper argues that an adequate approach to the firm should be able to accommodate the complexities of actual firm development. The latter is conceptualized in terms of three general stages: prime movers or drivers of change, change processes, and change attractors. Furthermore, any "real-world" firm is both a technical and an institutional unit. To emphasize the importance of "real firm" analysis, the discussion presented here revolves around an understanding of the much considered case of General Motors and Fisher Body integration has developed over time. Generalization from this case suggests that an integrated view of the firm is necessary that combines the three stages and the two bases (technical and institutional). Six general perspectives on the firm are identified as having technical or institutional bases that are relevant in each of the three stages. This integrated approach to the firm is explored in terms of the general topic of firm development. It is concluded that, without an integrated approach to firm development, a potentially biased or incomplete analysis can result.

Keywords: economics of the firm, firm development, vertical integration.

JEL codes: D21, L22, L62

1. Introduction

The basic message of this paper is that an adequate analysis of firm development requires an integrated framework based on differing theoretical perspectives. The background reasoning here can be set out as follows. The complexities involved with firm development require recognition of three general sets of factors: (1) the prime movers or drivers of firm change; (2) change processes; and (3) attractors for any firm change. It is apparent, therefore, that in discussions of firm development, differing perspectives on the same event can exist because particular analytical traditions (implicitly or explicitly) have a primary focus on one of these factors. For example, Coase (2006) criticizes 'hold up' explanations of General Motors' integration with Fisher Body. But, as set out below, the reason for the disagreement appears to be that 'hold up' can be classified as an attractor of the integration decision, whereas Coase appears to be concentrating on the drivers and process of the integration. We follow Coase in the current discussion by using the General Motors – Fisher Body case. The reason for this is that the case has been examined in great detail and the evolution of this discussion can be viewed as a useful "natural intellectual experiment" to illustrate the analysis of firm development suggested here.

To develop an analysis of firm development consistent with these principles, it would seem to be necessary to echo the approach of Coase. He emphasized (1937, p. 386) that we require 'a definition of a firm … which is … realistic in that it corresponds to what is meant by the firm in the real world'. In reality, the firm is obviously a technical unit, i.e. it is a unit that transforms factor inputs into outputs. Following Machlup (1967), this involves the manner in which production and cost functions interact with demand on the market. But equally the firm is an institutional unit

involving questions of basic definition, identity, internal structure and external boundaries (Hodgson, 2002). It follows that the firm in the "real world", to echo Coase once again, is both technical and institutional.

There is no real claim of originality in this conceptualization of the "real world" firm. For example, in a recent work Langlois (2007, p 66) claims that "Industrial structure is really about two interrelated but conceptually distinct systems: the technology of production and organizational structure that directs production. These systems jointly must solve the problem of *value* [creation]". Similarly, Casson (1997) separates economic activity into real and control spheres. But the current discussion takes this "real world" observation further. Each of the three stages of firm development, i.e. drivers of change, change processes and attractors for change, has different technical and institutional underpinnings. It follows that, without an integrated framework, involving analysis of the drivers, processes and attractors of firm change, a potentially biased or incomplete view of firm activity can result. This possible bias is illustrated in the General Motors - Fisher Body case study presented in this paper.

The rest of the discussion is organized as follows. In the next section, the nature of an integrated view of the firm is developed, based on an exploration of the way in which the different conceptual linkages of the firm as a technical and institutional unit can be reconciled. This section is basically a background literature review. Following this, section three considers research strategy and hypothesis development in the light of the discussion in section two. These two background sections (two and three) lead into the discussion of the General Motors – Fisher Body case in section four. The primary objective here is to show that the different views offered, when early and

more recent analysis is compared, suggest an analysis of the firm consistent with the earlier background discussion of the nature of "real" firms. Finally, in sections five and six, the divergent analyses of the case are generalized in terms of an integrated perspective on the firm and its development. Finally, brief conclusions are drawn.

2. Conceptualizing real-world firms: literature review

In this section, we consider possible issues involved with the conceptualization of real world firms. This involves a basic discussion of the nature of the suggested integrated approach to the firm that is developed here using the discussion of the case study and facilitating its analysis. A central complexity at the heart of the discussion is that, if real world firms are both technical and institutional, there is no single view of the firm as an institutional unit, with the implication that there is (in principle) no single mapping between institutional and technical definitions.

To simplify matters, we suggest that the firm as an institutional unit appears to exist in economics in two guises: the firm as an economizer and the firm as a strategizer (for want of a better term), or, equivalently, the firm as a follower and the firm as a leader [1]. Using, for example, Saviotti (1996) and Nooteboom (2004), we can understand that these two categories of firm are not just theoretical devices but they also carry empirical content because of different cognitive requirements. Homogeneity of the knowledge base of a firm is a necessary characteristic of high performing activity. But, variety and novelty of cognition is appropriate for a firm when strategic leadership issues are important, for instance, when new technological trajectories are available involving a rupture with the knowledge base that previously

[1] This distinction is equivalent to the categories of innovator versus adaptator used in Lazonick (1991).

existed. To us, this necessary variety implies that generating focus is a key organizational/managerial task with attendant costs.

Figure 1 here, see end

Figure 2 here, see end

In schematic terms, the general linkages involved with these two approaches (efficient motivator and long-run focus) are summarized in Figures 1 and 2. The institutional firm as an economizer or follower has a core theoretical focus based on efficient motivation, as exemplified in the transaction cost work of Oliver Williamson (1975, 1985). For example, Williamson (1991) suggests that approaches to the business firm cluster under two general headings: "strategizing" and "economizing". In addition, he claims that "… economizing is more fundamental than strategizing …" and furthermore that this "is the central and unchanging message of the transaction cost economics perspective" (p. 76). In Figure 1, basic technical characteristics, and in particular asset specificity, along with bounded rationality and opportunism, produce motivation problems. This reflects Williamson's approach based on economizing existing transaction costs that arise from the misuse of standard factors of production, along with well-defined production functions that require an alignment of incentives. The problems are managed using the most efficient, i.e. transaction cost minimizing, institutions. Hence, the exogenous technical characteristics are drivers of change and the motivation problems and efficient responses are attractors of change. This approach is explicitly ex-post in its logic, i.e., the firm as an institution emerges following motivation problems. But the same abstract reasoning is evident with the ex-ante logic of agency theory in which optimal contracts are developed to manage

motivation issues given information asymmetries; for example, Hart's (1995) financial theory of the firm. Finally, the property rights approach of Alchian and Demsetz (1972) illustrates the same abstract logic, in which team production produces motivation problems and a requirement for hierarchical management. Presenting the "efficient motivator" approaches in this way reveals that they all have a common methodological root grounded in a comparative static method. The firm as an institution emerges in response to exogenous technical characteristics. This is transparent in, for example, new institutional approaches to accounting (see Dietrich 2001). Alternatively, the same logic is transparent in Milgrom and Roberts (1992), but also in Greenwood and Jovanovic (1999), Hobijn and Jovanovic (2001), Brynjolfsson et al. (2002) on the issue of 'intangible assets', which suggest that new flexible technologies reduce asset specificity and hence lead to vertical disintegration because of transaction cost factors. This has been further developed in Rajan and Zingales (2001), who consider that technological and financial revolutions have had an impact on the nature of firms. All these contributions echo previous developments in finance theory, such as Merton's and Scholes' Nobel lectures (1998), where the 'firm of the future' was considered as of an organizational form far different from earlier forms, with option theory virtually offering protection against all contingencies, including potentially opportunism.

The institutional firm as a strategizer or leader emphasizes the long-run focus of the firm, hence the term used in Figure 2. Here the driver of change is firm strategy or characteristics, with change processes being governed by what is termed in Figure 2 a firm's productive opportunity. Hence there is no obvious attractor of change because the future is not known and has to be imagined. Therefore, the emphasis is placed on

processes. This general approach is exemplified in neo-Austrian approaches to the firm (for example Langlois, 2003; Langlois and Robertson, 1995). Here a distinction is drawn between long-run and short-run transaction costs. Short-run transaction costs are those that exist in traditional (Williamsonian) theory. Long-run transaction costs are incurred with the management of strategic reorientation. The approach is neo-Austrian because ignorance and tacit knowledge produce profit opportunities for particular firms. But the exploitation of these opportunities is not costless, as appears to be the case in traditional Austrian economics (for example Hayek, 1945);, but rather, it involves investment in managerial and complementary assets. These long-run transaction costs would not exist in a world in which long-run, firm specific, profit opportunities did not exist.

Consistent with the neo-Austrian approach is the competence approach to the firm (for example, Foss and Loasby 1998; Krafft, 2000). This builds on the earlier work of Penrose (1959), Richardson (1972) and Nelson and Winter (1982). The idea of managed long-run focus is explicit in the work of Penrose; the term "productive opportunity" in Figure 2 is taken from her work. In the work of the post-Marshallian Richardson, and in the evolutionary approach of Nelson and Winter, long-run focus still exists but is more emergent (to use Mintzberg's (1990) term) rather than explicitly planned. But whether firm specific opportunities are emergent or planned is somewhat irrelevant for the reason that firm performance is not explained as a comparative static response to exogenous technical characteristics. Instead, the technical and organizational characteristics of the firm are endogenous to the long-run focus of firms. This approach is explicit in the dynamic capabilities approach to the firm (for example Teece and Pisano, 1994).

3. Research strategy and hypotheses development

This section draws out key methodological implications of the literature presented in the previous section. These methodological matters facilitate analysis of the General Motors – Fisher Body case study (to be developed later in section four). The intention here is to avoid reducing the case to a descriptive entity.

3.1. Research strategy "the firm as efficient motivator"

Major neo-institutionalist approaches to industrial organization, namely transaction costs, agency theory and property rights generally, play an important role in empirical contributions since they offer a simple, suitable framework. Compared to neoclassical theories of the firm, neoinstitutionalist approaches certainly render the connection between the representation of real world firms possible and apparently straightforward, since they focus on the same object of study: the firm as a complex system of interactions, the boundaries of which may evolve over time. From this perspective, empirical contributions have shown that institutional forms are modified over time and that these modifications can be explained by motivation problems, as technical characteristics favor the emergence of private information and opportunism (Shelanski and Klein, 1995). These approaches seem to be affected, however, by three major limits when one wants to develop an analytical framework able to accommodate the complexities of real firm development. The first concerns the 'comparative analysis of institutions' (Williamson, 1989, p. 136), which assumes that the definition and the comparison of respective efficiencies of different forms of institutions are possible. Within this type of analysis, nothing can be said about the emergence, evolution and viability of institutional or industrial forms. The second

limitation is connected to the deductive method, which is often used in the connections between theoretical analysis and empirical work. The third limitation is related to the systematic reduction of complex phenomena involving the evolution of industrial activities to simpler issues such as firm motivation in a context of imperfection or asymmetry of information.

The key hypotheses of the research strategy "the firm as an efficient motivator" are that they naturally articulate the empirical work to be produced from the theoretical framework, and also strongly condition the representation of real world firms.

a) Comparative analysis of institutions

This explicitly involves the idea that one can compare different forms of institutions in order to define an optimal structure. This notion was extensively used in transaction cost analyses, and also in other dominant neo-institutionalist approaches such as agency theory and property rights. In all of these theories, the costs and advantages of alternative forms of institutions (firms, market, cooperation) are evaluated, and this evaluation exhibits an efficient solution to information and incentive problems. This procedure is not significantly different from inter-temporal optimization and even mechanical convergence towards equilibrium, all neoclassical notions that have always been so comprehensively rejected as soon as evolution is considered. The major problem is that the question of the evolution of institutional forms and the progressive predominance of one mode over another is reduced to the instantaneous calculus of the optimal solution, i.e. the attractor of change. The issue of change in real time, in which actors interact concretely and coordinate progressively, is neglected, although it is central to the study of a firm's long run focus. Hence,

reliance on optimality makes it difficult to handle anything other than comparative statics, since out of equilibrium means that someone must be failing to optimize.

b) Deductive method and confirmation

The relation between theories and facts is always critical. The predominance of a deductive method naturally leads economists to consider realworld phenomena as potential illustrations of their theoretical frame. In the research strategy "the firm as an efficient motivator", the sequence of this reasoning can be summarized in the following way: theoretical hypotheses are defined => the optimal organizational structure for the firm/industry is determined => empirical applications are defined. Confrontation between different evidence coming from the empirical study of real world firms, in the context of different theoretical approaches, is thus not characteristically the priority. For instance, vertical integration in real world firms often involves complexity, as one product may be a member of several filières. The literature on 'the firm as an efficient motivator' only considers a single production sequence and reduces intrinsically the degree of complexity, presumably for possible applications to the framework.

c) Focus on the motivation

The focus on motivation problems is not a problem in itself. Most of the advances in industrial organization since the 1970s, and especially all approaches that enter into the research strategy "the firm as an efficient motivator", are centered on this question. A difficulty emerges, however, when this focus becomes exclusive in that it obscures other questions, such as the study of a firm's long run focus. Raising this issue hinges on the essential distinction between knowledge and information. The

motivation problem discussed here arises essentially from differences in information. If everyone has full information and everything could be arranged *ex ante,* then opportunism would be impossible. In addition, the information content of any message is identical for all recipients, and there is no problem of knowledge. Consequently, this literature misses any incentive to develop knowledge, which has been recognized (by, for instance, Smith, Marshall and Schumpeter) as essential to a theory of development.

3.2. Research strategy "the firm as long run focus"

Though less well recognized compared to transaction cost theory, agency theory and property rights theory, the firm as long run focus requires a recombination of existing frameworks. This research strategy centers on the evolution, development and accumulation of competences. The representation of the real firm is characterized by three new elements, which may give content to the development of new hypotheses supporting the representation of real world firms.

a) ***Diversity and evolution of institutions***

Following Coase (1972, p. 60-64) in a famous paper on how to define the empirical program in the field of economics of the firm and industrial organization, we primarily have to focus on the way in which the activities undertaken are divided up among firms, namely why and how some firms embrace many different activities while for others the range is narrowly circumscribed; why and how some firms are large and others small; why and how some firms are vertically related and others not[2].

[2] In this program, the 'activities' to be undertaken are not defined by a production function but require specific 'knowledge how', including how to integrate activities. For a complete analysis of this see Nooteboom (2009), winner of the 2010 Schumpeter prize.

The issue here is to describe and to analyze the manner in which the firm and the industry are organized now, but also how they differ from what they were in earlier periods. The connection between theory and evidence requires an understanding of the forces that were operative in bringing about a given organization at the level of the firm or the industry, and how these forces have changed over time. The emphasis, therefore, is on concrete drivers and processes of change.

b) ***Inductive method and confrontation***

The issue here is to capture regularities in observed phenomena and elaborate on this basis plausible and testable assumptions to understand these regularities. The analysis under the research strategy "the firm as a long-run focus" centers on the process by which a given trend of evolution has been achieved, and also why divergent paths may exist. The sequence of reasoning is here: observed organizational structures are determined => regularities and anomalies are characterized and confronted to theoretical results => new theoretical propositions are generated.

c) Focus on long run focus and the coordination of production

The coordination of productive activities is an essential problem in innovation, but too often neglected. The reintroduction of this key element in the understanding of the real world firm is thus an important step. However, one should be aware that the exclusive focus on this type of approach may also generate similar drawbacks as the exclusive focus on the motivation problem. As a consequence, the connection between facts and theory should develop on the basis of a new mode of confrontation: not only the traditional confrontation between theories and facts, but also between different theories, some oriented towards the motivation problem and the firm as an

efficient motivator, and some oriented towards the coordination of production according to a long run focus. This issue is further examined below, following discussion of the case study.

Recognizing the potential relevance of the views of the firm illustrated in Figures 1 and 2 suggests an inevitable complexity in the conceptualization of the economics of the firm. Before considering this abstract development of an integrated view of the firm, the discussion will turn to the General Motors – Fisher Body case. This case is valuable because, if the evolution of the analysis and documentation is examined, it illustrates the key message being emphasized here that real world firms involve multiple linkages between technical and institutional factors. Hence, it provides a "laboratory" case of the general analysis provided in this section.

4. The evolution of the General Motors/Fisher Body case

General Motors/Fisher Body (hereafter GM/FB) has certainly been one of the most extensively discussed historical cases in the literature on the development of the firm and specifically on vertical integration. As such, it provides a useful example of a "real world" firm that can inform later conceptual development. The core objectives of this section are to show (1) how the analysis of this case has evolved, and (2) that the different perspectives offered suggest a view of the firm that should accommodate technical and institutional factors as well as drivers, processes and attractors of change, as set out above.

For a long time, and for most of the commentators (Klein, Crawford and Alchian, 1978; Joskow, 1988; Shelanski and Klein, 1995; Crocker and Masten, 1996), this case

was essentially considered as an example of hold up in the presence of asset specificity. In 1926, General Motors acquired its supplier of automobile bodies, Fisher Body, because Fisher Body held up General Motors. It is generally claimed that Fisher Body did this by locating its body plants far away from the General Motors assembly plants and by adopting inefficient methods of production, thus increasing both the cost of producing bodies and the profits of Fisher Body under its cost-plus contract. This interpretation justified the historical relevance of a new institutional interpretation of the economics of the firm, based on the minimization of transaction costs (Tirole, 1988; Carlton and Perloff, 1994; Williamson, 1985; Ricketts, 1994). But new evidence has been provided, by, for example, Coase (2000), Freeland (2000), Casadesus-Masanell and Spulber (2000), which tends to suggest that the dominant explanation based on transaction costs problems is not universally accepted, and even that such an explanation has tended to neglect other major determinants of vertical integration.

To analyze these differing perspectives on the GM/FB case, we will refer to the dominant hypothesis, in which "holdup is the main rationale for vertical integration", (see Table 1 below), as hypothesis H0. This null hypothesis is supported by Klein (2000), who reaffirms his initial idea with Crawford and Alchian that the facts of the GM/FB case are fully consistent with a hold up description. To him:

> the evidence unambiguously demonstrates that while the contract initially worked well, this contract broke down in 1925 when GM's demand for Fisher bodies increased dramatically. Fisher then refused to make the necessary capital investments required to produce bodies efficiently for GM, in particular refusing to build an important body plant close to GM production facility in

> Flint, Michigan. These contractual difficulties were the primary reason GM decided in 1926 to vertically integrate with Fisher Body. (Klein, 2000, p. 106)

In reaffirming the dominant argument, Klein clearly supports a unidirectional relationship between technical factors and efficient motivation based on conventional new institutional economics. Basic technical characteristics, and especially asset specificity, along with bounded rationality and opportunism, produce motivation problems that can only be managed using the most efficient institution (here, vertical integration which guarantees transaction cost minimization).

Coase suggests an alternative interpretation of the GM/FB case which supports the idea that H0 can be contested by historical facts. In abstract terms, part of Coase's contribution can be viewed, therefore, in terms of the distinction between deductive and inductive methods, as set out in the previous section. To him, asset specificity is only a potential rationale for vertical integration, not sufficiently high enough in the present case to justify vertical integration. Note that the idea of potential rationale is consistent with H0 being a developmental attractor. But the claim that this is not high enough in the present case suggests that the attractor is dominated by processes. Also note that Coase is not saying that hold up is in principle wrong, but is generally part of a wider analysis that has potentially multiple facets. Three reasons motivate Coase's (2000, p. 15) argument. First, "What General Motors acquired in 1926 was the 40 percent of the shares of Fisher Body that it did not already own". Presumably, for advocates of the hold up principle, 60 percent ownership would normally have solved the problem and full integration would have not occurred. Second, "Fisher Body did not locate its plants far away from the General Motors assembly plants". Here again,

the hold up principle does not hold. Finally, "it is also most implausible, for many reasons, that the Fisher brothers would have used inefficient methods of production". Consequently, there is no evidence that a holdup occurred. H0 is thus not sustained by historical facts, and an alternative hypothesis is suggested (see Hypothesis H1, Table 1 below): "Asset specificity (with or without hold up) is normally handled satisfactorily with long term contracts without requiring vertical integration".

Coase, therefore, appears to be suggesting that technical factors (i.e. asset specificity) are the point of departure for analysis of the case, but they do not necessarily produce efficient motivation problems (i.e. hold-up). We earlier characterized H0 in terms of a unidirectional link between technical factors and efficient motivation as an attractor of change. The alternative H1 questions the dominance of this linkage, for the GM/FB real case. Instead, technical factors are linked to long run issues, such as the complete acquisition of a company which was already partially owned, or the location of plants viewed as part of a broader strategy implemented by the acquired company, Fisher Body. In turn, these different long run elements had an impact on the methods of production of this latter company, which could have been be viewed as inefficient from outside, and especially from the acquirer point of view, i.e. General Motors. In short, Coase appears to be suggesting that we must recognize the technical drivers of change and, following this, the developmental processes that resulted. We can view this as an alternative to H0 as a developmental attractor.

Freeland also contests H0, and suggests that hold up never occurred. He advances a different interpretation of the case based on the role of human assets in determining the boundaries of the firm. To him, vertical integration was "caused primarily by the

desire to acquire and retain the specialized knowledge and services of the Fisher brothers" (Freeland, 2000, 35). Further, he shows that, if hold up occurred, it is after integration since, because of their specialized knowledge, competences and skills, the Fisher brothers could significantly shape the strategies of the integrated company. Thus, we can define H2 (see Table 1 below), supported by Freeland, according to which "Access to specialized human capabilities favours vertical integration which may, in turn, produce holdup situations". Using our earlier interpretation, the link from technical conditions to efficient motivation is not selected. Instead, the implementation of a long run strategy, in terms of how to recruit and retain human capital, is claimed to have had an impact on technical factors (i.e. knowledge, competences and skills). Furthermore, an additional complexity here is that the specialized knowledge, and the resulting organizational position, can influence strategies, i.e. inefficient motivation outcomes can have dysfunctional effects if not adequately treated. We see, therefore, once again, an apparent emphasis on drivers and processes. But we see a subtle difference compared to earlier discussion. Coase emphasized technical drivers of change, but for Freeland, the drivers are viewed as organizational rather than technical.

Finally, Casadesus-Masanell and Spulber also contest H0. First, they stress that "the historical record indicates close collaboration and trust between the companies, which contradicts supposed contract failures. The extensive participation of the Fisher brothers in GM management beginning in 1921 also indicates an absence of alleged opportunism by Fisher" (Casadesus-Masanell and Spulber, 2000, p. 68). Second, "the initial acquisition in 1919 also accompanied by substantial investment by GM in Fisher and a voting trust arrangement in which executives from the two companies

had equal control over Fisher's board of directors, which contradict the need for property rights to exercise control" (ibid). Third, "Fisher Body did not price opportunistically under its manufacturing contract. Many Fisher Body plants already were located next to GM plants before 1926" (ibid, p. 69). In addition, "the supposed transaction-specific investment in metal presses and dies is inconsistent with Fisher's manufacturing technology, which was wood based and labor intensive and therefore flexible and not transaction specific" (ibid). This leads the authors to suggest an alternative hypothesis, more closely oriented towards the coordination of production in an innovative context:

> … the closed auto bodies made by Fisher represented quality and comfort and were a source of competitive advantage for GM in its competition with Ford… Vertically integrating into auto body manufacturing allowed GM better to coordinate the management of inventories, production and purchasing given the transportation, communications, and data-processing costs existing at that time. (ibid)

Thus H3 (see Table 1 below) can be termed as "the coordination of production in an innovative context stimulating vertical integration". The innovative context here implies that technical factors, such as plant location and pricing issues, were an aspect of the long run strategy of the acquired company. This suggests that the key conceptual linkages were from long-run strategy to technical factors (as well as the reverse). Also, close collaboration and voting trust arrangements between the acquired and acquiring firms were shaped by, and also shaped, long run focus. This suggests that, in addition to strategy and technical factors being inter-linked, strategy and motivation were also inter-connected. Hence we see, once again, an emphasis on

drivers and processes. In both cases, technical and organizational factors are introduced.

New evidence on the GM/FB case is especially interesting to us since it can be interpreted as indicating the development of an integrated approach to the firm. Though empirically driven research sustained for a long time the predominance of vertical integration by transaction costs economics, and to some extent confirmed a unique body of analysis to be tested, it seems that things have now changed. As summarized in Table 1, and on the basis of a new series of observations on historical archives, H0 is confirmed by some authors but contested by others. In particular, the significance of efficiency seeking behavior and the adoption of optimal structures as developmental attractors is downgraded and emphasis is placed on firm specific developmental drivers and processes.

Table 1 here, see end.

When H0 is rejected, new propositions for theoretical investigation of the economics of the firm are systematically provided. Moreover, these new propositions tend to move progressively from a vision of the firm as an economizer or follower to the firm as a strategizer or leader; and from a dominance of attractors to the recognition of processes. These new propositions stimulate the investigation of a wider spectrum of conceptual links to interpret historical facts, which complements earlier understanding. This recognition of a wider theoretical spectrum leads to the economics of the firm having a greater empirical relevance and suggests the importance of a more general integrated perspective on the firm.

5. An integrated perspective on the firm

This section will generalize the implications of the GM/FB case study in terms of how we might analyze the economics of the firm as both a technical and institutional unit. To reiterate the earlier summary: the economics of the firm can be understood in two distinct contexts, technical and institutional. The technical context involves the production of goods and services in particular market settings. Two alternative institutional views on the firm appear to exist in economics: the firm as an efficient motivator and the firm as a long-run strategic unit in which emphasis is placed on generating strategic focus. Of course, any real world firm is both an efficiency seeking and strategic unit – with the interactions involved being central to the economics of the firm. This is hardly an original observation. For example, Barnard (1938) emphasized that both effectiveness and efficiency are necessary for survival. In addition, he noted that, in the long-run, efficiency is the extent to which a firm can satisfy the motives of individual members. This is obviously a somewhat different definition than that characteristically adopted in economics including transaction cost theory. It follows, therefore, that an important complexity is that the dominance of efficiency seeking over strategy may involve different characteristics compared to a reverse dominance, a point that is emphasized by, for example, Gehani (2002) in his discussion of Barnard.

Figure 3 here, see end

Presenting the institutional approach to the firm in the manner suggested here, i.e. as essentially two general schools of thought, reveals that the linkages are to some extent

partial or incomplete. To develop an integrated approach to the firm a more fully connected set of linkages can be recognized. In schematic terms, this fully connected model is presented in Figure 3. In addition, this diagram draws explicit connections between the various linkages and the GM/FB case study. Link (1) defines conventional new institutional economics, as considered in section two. Link (2) defines the competence and related approaches to the firm, as considered earlier. These first two approaches constitute what might be considered the recognized literature on the economics of the firm. For this reason, they are perhaps less interesting than the 'alternative' frameworks defined by links (3)-(6).

The nature of link (3) can be explained in the following way. The causation operates from motivation systems to the technical characteristics of the firm i.e. the reverse of traditional new institutional economics. For example, Morroni (1992) suggests that organizational indivisibilities, arising from the management of transaction costs, produce economies of scale. These organizational indivisibilities are based on management of search, negotiation and/or policing matters i.e. control of factors of production. Using a standard production function analysis of the firm, a change in factor productivities will change production based scale economies and hence influence firm size and market structure. But for real firms, managing real change in real time, we need not assume that organizational search, negotiation and policing is necessarily efficient in the manner suggested by new institutional economists. Hence, link (3) may, or may not, promote long-run firm sustainability. Either way of conceptualizing link (3) suggests the same conclusion: the management of firm motivation can impact on the technical characteristics of the firm. In terms of the earlier case study, the possible relevance of this link was suggested by Freeland: if the

impact of firm strategies on motivation systems is not recognized (this is link 5 in Figure 3, discussed below) such systems can adversely affect technical factors, i.e. can negatively impact on long-run viability.

A possible implication of the negative as well as positive aspects of link (3) is that it might help to explain why nearly all firms eventually disappear. Continuing with the work of Barnard (1938), firms tend not to be long lived because they cannot guarantee both effectives and efficiency on a continuing basis. His view of long-run efficiency, as considered above, implies that the motivations of individuals within a firm guide long-run (technical) development, i.e. link (3). In addition, it is the basis for his view that firms are cooperative systems that are subject to breakdown. Of course, within a more narrowly defined economics, Marshall's views on firm life cycles are not inconsistent with negative as well as positive aspects to link (3).

The characteristics of link (4) can be explained in ways suggested by Langlois and Robertson (1995). With firm strategic investment decisions, i.e. decisions involving long-run focus, the variable costs of existing projects will be compared with the total costs of new projects. With significant sunk fixed costs a bias will therefore exist towards current ventures and technologies. This bias will generate inertia in the long-run focus of firms. Of course, this inertia is more viable with a degree of monopoly power for existing firms. Among other things, this potential importance of monopoly power implies that link (4) may be less relevant in 'new economy' Schumpeterian industries that Schmalensee (2000) depicts as 'winner takes most' markets. The creative destruction in such industries undermines the significance of existing sunk assets.

In terms of the earlier case, link (4) is emphasized in different ways by Coase with his explanation of the firm as a pool of resources, and Casadesus-Masanell and Spulber. The emphasis here was on a technical driver to firm change, but as the change impacts on a firm's long-run focus, the analytical emphasis is on the process of change, not the pull of an attractor. A possible complexity for link (4) is the existence of sunk investments with technological complementarities, as explored in Chandler (1977). For example, the production and distribution of a good might involve sunk, fixed real and organizational assets. The complementarities involved produce coordination problems in the presence of environmental uncertainty. Because of the sunk and fixed nature of the assets, any coordination failures produce significant efficiency losses. These losses are not due to coordination issues in the context of agent motivation (i.e. link 1), but because of the technological complementarities involved. The solution (in Chandler's case, by vertical integration) implies that technical characteristics channel long-run organizational characteristics.

Link (5), from motivation systems to long-run focus, can be considered the organizational analogue of link (4). Given the sunk costs of setting up and managing contracting and motivation systems, a bias towards the use of existing organizational methods and processes will be introduced. If strategic re-orientation involves fundamental organizational change, such re-orientation can be rationally blocked, i.e. long-run strategies and focus will be constrained and channelled in particular directions. Mintzberg (1990) suggests that organizational rigidities and inertia might exist because strategies are filtered through existing learning processes. Similarly, Nooteboom (2004) suggests that recognizing the centrality of individual and

collective cognition implies the existence of firm specific path dependencies, because of the sunk costs of cognitive efficiency rendering it domain limited (see also Nooteboom, 2009). In terms of the earlier case, link (5) is emphasized by Freeland, and Casadesus-Masanell and Spulber. But in both cases, this link is part of a larger explanation. For Freeland, if the organizational impact on long-run focus is not managed properly, there will be adverse effects on technical factors (link 3). For Casadesus-Masanell and Spulber, the effect of link (5) has the beneficial impact via link (2).

The nature of link (6) can be summarized under the shorthand of strategizing or economizing. Or as indicated above, the same idea can be captured under the distinction between firms acting as leaders or followers. If firms act as leaders, investment in organizational assets is required to enable the development of new strategies or to manage the flexibilities required to effectively exploit market opportunities. Such assets are not necessary for follower firms (Langlois, 1986). In turn, the required capabilities for effective innovation and flexibility will have an impact on organizational motivation systems. In short, organisational motivation need not be simply an efficient response to exogenous technical characteristics, but may depend on long-run objectives. One way of conceptualizing these impacts is to distinguish between long-run and short-run economizing. With short-run economizing, firms respond to cost and revenue potential. For long-run economizing, cost and revenue potential are endogenous to firm strategies, with higher costs being required for the management of faster or more fundamental change. In terms of the above diagram, link (5) is based on the dominance of short-run economizing, whereas link (6) has long-run economizing being dominant. From the case study, link (6) is

highlighted by Casadesus-Masanell and Spulber and so is viewed as the interaction between motivation systems and focus, a feature of the analysis developed shortly.

6. Analyzing firm development

The integrated model suggested in the previous section indicates the potential complexity involved when analyzing the firm in concrete detail. In addition to identifying links (1)-(6), the complexities involved can be increased by combining the links. This combination is clear from the earlier case study, and is also done by theorists who suggest that competence and transaction cost approaches are complements rather than substitutes (for example, Foss, 1993; Langlois and Robertson, 1995; Hodgson, 1998). But this issue of complementarities is perhaps more involved than basing an explanation of firm development on more than one of the links in Figure 3. It was suggested at the outset of the discussion that, in principle, the complexities involved with firm development require recognition of three sets of factors: (1) the prime movers or drivers of change, (2) change processes, and (3) attractors of change. If a black-box optimizing view of the firm is adopted, factors (1) and (2) are effectively removed, or side-stepped, from discussion of firm development. Drivers are analyzed as exogenous changes in demand and/or cost functions. The assumption of optimizing responses to any changes collapses analysis of firm development into a comparative static framework and so marginalizes issues of change processes. Hence, the characteristic economic approach to firm development concentrates on the equilibrium attractors of firm development. To map this analytical approach into an interpretation of actual firm development produces potentially partial and biased analysis, as indicated above with the case of General Motors and Fisher Body.

In general terms, the drivers of change can be viewed as any factors that produce a shift in firm long-run focus or strategy. It is clear from earlier discussion that such factors can be both technical and organizational. Different theoretical traditions view these drivers as external and/or internal to the firm. For example, traditional black box theories view drivers of change as exogenous environmental shocks to which organizations respond. On the other hand, competence views of the firm allow change to be internally generated, as exemplified in Penrose's (1959) view of management that emphasizes a firm's unique productive opportunity[3]. In terms of the integrated framework suggested above, if we recognize firm change as an evolutionary process, these drivers of change are accounted for by links (4) and (5), i.e. the technical and organizational impacts on long-run focus.

Change processes can be viewed, in general terms, as the impact of shifting firm focus on technical or organization firm issues. In terms of the earlier integrated model of firm development, these processes involve links from long-run focus towards technical factors (link 2) and motivation systems (link 6). Finally, the attractors of firm development are either organizational or technical. Organizational attractors are equilibrium responses to ex-ante technical conditions (link 1). Technical attractors are the equilibrium responses to ex-ante organizational conditions (link 3).

It follows from this discussion that the integrated framework considered in the previous section can be viewed as combining the drivers, processes and attractors of

[3] A complexity here is that Penrose's 'productive opportunities' are decomposable into 'subjective productive opportunities' which are imagined and 'objective productive opportunities' which correspond more to our long run focus.

firm development.[4] In addition, the drivers, processes and attractors of change can each be viewed as either organizational or technical. But, while a sequential view of drivers, processes and attractors is a useful heuristic, we should guard against an oversimplified analysis of firm development. In this regard, the following complexities would seem to be important:[5]

1. If we recognize the input from resource or competence views of the firm, the connections between drivers and processes will be firm specific.
2. There will be "feedback" effects from processes to drivers based on firm cognition and knowledge development that involves learning and discovery.
3. Attractors of change may be endogenous to processes if organizational or technical lock-in exists. This possibility of lock-in was highlighted in the earlier discussion. The extent to which attractors are endogenous to processes is an empirical issue. But a general principle is that endogenous attractors should be viewed as locally rather than globally efficient or optimal (North, 1990; Arthur 1994).
4. There will be additional "feedback effects" from attractors to processes if attractors imply significantly changed competitive conditions.

Figure 4 here, see end

The complexity implied by these comments is illustrated in Figure 4. To explore some of the issues involved here, and to move the discussion beyond the specific case study

[4] This three stage analysis of firm development is informed by recent writing in evolutionary economics that emphasizes three general evolutionary stages involving discovery, process and equilibrium. See Dopfer, Foster and Potts (2004).

[5] A referee for this journal quite correctly pointed out that all intellectual development is based on what Popper would call conjectures. Like scientific conjectures, the complexities suggested here are obviously contingent rather than definitive.

reported earlier, two brief examples will be offered that are somewhat standard in the literature on the economics of the firm: analysis of multinational companies (MNCs) and discussion of diversification.

With respect to the first of these, it has been claimed that transaction costs, or internalization theory as it is called in the MNC area, are an adequate explanation of multinational development (for example Hennart, 1982). But Dunning (for example 1993), based on detailed empirical investigation, has developed his own eclectic paradigm, or the OLI framework based on Organizational, Location and Internalization factors. In his own words (1993, p.75-6):

> [The OLI paradigm], while accepting the logic of internalisation theory, argues that it is not, in itself, sufficient to explain the level and structure of the production of a country's own firms outside their national boundaries, or of the production of foreign-owned firms in its midst.

In addition

> In the static model of internalisation, [owner-specific] variables … are taken to be exogenous… However, viewing the growth of the firm as a dynamic process, the legitimacy of this assumption is questionable. For a firm's current core competences … are the outcome of past decisions which, at the time they were taken, were endogenous to the firm.

These comments are perfectly consistent with the unified approach to the firm developed here. For MNCs location specific factors are institutional as well as physical, and constrain and hence impact firm specific objectives. In terms of the earlier integrated model, these are external impacts that have an effect on firms via the

drivers of change i.e. links (4) and (5). In addition, to understand adequately MNC development, firm specific processes and (internalization) attractors must be recognized.

With respect to the second example to be suggested here, i.e. diversification, there are once again somewhat standard transaction cost accounts (for example Williamson 1985; Teece, 1982). But, from an empirical perspective, a key observation is that the process of diversification is more complex than recognizing equilibrium attractors. With respect to diversification processes, it is somewhat standard to link these processes to merger activity and to recognize that many mergers do not improve firm performance (for example Ravenscraft and Scherer, 1987). Many possible explanations exist for this allegedly irrational diversification activity, but in the current context, two may be emphasiszd. First, managerial objectives may dominate decision making (Mueller, 2003) perhaps in the context of the overestimation of compatibilities and the underestimation of differences between merged entities. Second, firms may behave as Cournot [Stackelberg?] followers and not take account of the impact of merger activity on market structure (Martin, 2002). In either case, these explanations imply that a full account of diversification, and the merger processes involved, requires recognition of firm specific objectives, i.e. in terms of Figure 3, the long-run focus of a firm. In short, as with MNCs and vertical integration, an adequate analysis of diversification that recognizes the complexities suggested by empirical observation, would appear to require an integrated approach to firm based on drivers, processes and attractors.

These examples, and the case developed earlier, would appear to suggest that two ways exist to manage the complexities involved with the economics of the firm. First, emphasis might be placed on identifying the key linkages in particular developmental circumstances. This is exemplified in the modern life-cycle based analysis of technologies, industries and firms (Klepper, 1997). But an implication here is that linkages relevant in different developmental stages and with different firms need not be the same. Such a research strategy is empirically driven. The second approach is theoretically driven: a particular conceptual framework can be adopted, but non-core frameworks (linkages) can be recognized and introduced as constraints. Once again, the nature of the constraints is likely to be contingent on developmental circumstances.

An important complexity exists with either the empirical or theoretical strategies. Some frameworks may be complements, but others may be inconsistent. In addition, the nature of any complementary or inconsistent frameworks may be contingent on evolutionary circumstances. For example, if managerial objectives dominate merger and diversification decisions, it is by no means obvious that transaction cost reasoning can be used as a developmental attractor because the decisions involved are not efficiency seeking. Alternatively, if organizational or technical attractors are important, this will undermine managerial objectives. A second example concerns the possible importance of firm strategic lock-in or path dependency. If this exists, which itself is an empirical matter, it would suggest that change processes dominate the economics of the firm. But if, following Figure 4, changed competitive conditions undermine path dependencies, this is likely to reinforce the analytical importance of drivers and attractors, with path dependency becoming inconsistent with this. Note

that this importance of competitive conditions is likely to introduce the significance of life-cycle considerations, as mentioned in the previous section in the context of Barnard and Marshall. In short, an economics of the firm consistent with the case study, and theoretical generalization of this study, would seem to suggest that analysis should be open to different frameworks being relevant in different circumstances.

7. Conclusion

The primary claim of this paper is that an integrated approach to the firm is necessary if the complexities of "real" firm development are to be effectively analyzed. Two sets of complexities are suggested here. First, the hardly original claim that any real world firm is both technical and institutional. Second, that firm development involves three general stages: prime movers or drivers of firm change, change processes, and attractors for firm change. Using these two sets of complexities as a guide, it is shown that existing approaches to the firm can grouped into six categories based on particular combinations of the stages of firm development that are addressed and whether technical or institutional factors are viewed as primary.

These themes are explored, initially, using the well-known case of General Motors – Fisher Body integration. It is shown that different interpretations of this case map directly into the different conceptual linkages suggested in the first part of the discussion. It follows that potentially all explanations appear relevant, but in different contexts. This conclusion is further developed in terms of an integrated perspective on the firm that generalizes the material presented in the case study. While the case study used here, and generalization of this study, indicate the richness and relevance of an integrated approach to firm development, further work both case based and more

general is required to indicate the manner in which the integrated approach suggested here can be used in different circumstances involving different industrial and evolutionary contexts. It follows that, even though different perspectives on the firm can claim empirical validity for particular approaches, these claims are incomplete or biased as general explanations of firm development. In short, while there are obvious advantages to an intellectual division of labor, these advantages should not obscure the potential shortcomings, or partial interpretations, offered by different approaches and the more complementary nature of a more integrated approach.

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Table 1: A synthesis of new evidence on the General Motors / Fisher Body case

Empirical implications of models	H0: holdup in presence of asset specificity explains vertical integration => new institutional economics is confirmed => key link: technical factors → efficient motivation
Empirical observations	4 observations based on historical archives: (1) Klein; (2) Coase; (3) Freeland; (4) Casadesus-Masanell and Spulber.
Acceptance/Reject of hypotheses	1) H0 is confirmed 2) H0 is contested 3) H0 is contested 4) H0 is contested
New formulations	1) no new formulation => attractors of change: technical factors → efficient motivation 2) H1: Asset specificity (with or without hold up) is normally handled satisfactorily with long term contracts without requiring vertical integration. => technical drivers and processes of change: technical factors → firm strategy firm strategy → technical factors 3) H2: Access to specialized human capabilities favours vertical integration which may, in turn, produce holdup situations. => organisational drivers and processes of change: technical factors → firm strategy motivation → firm strategy 4) H3: Coordination of production in an innovative context stimulating vertical integration. => technical and organisational drivers and processes of change: technical factors → firm strategy firm strategy → technical factors motivation → firm strategy firm strategy → motivation

Figure 1: The firm as efficient motivator

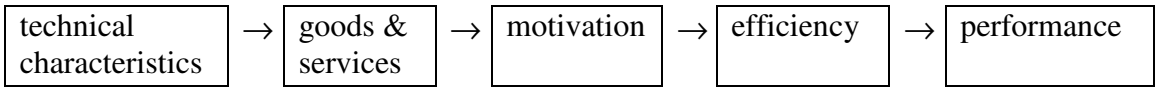


Figure 2: The firm as long-run focus

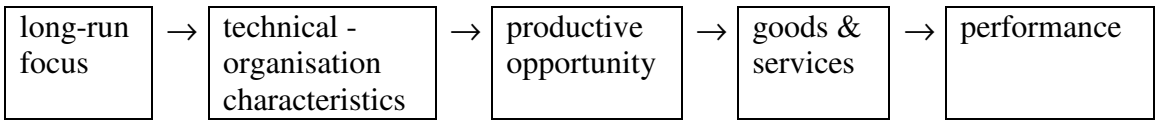
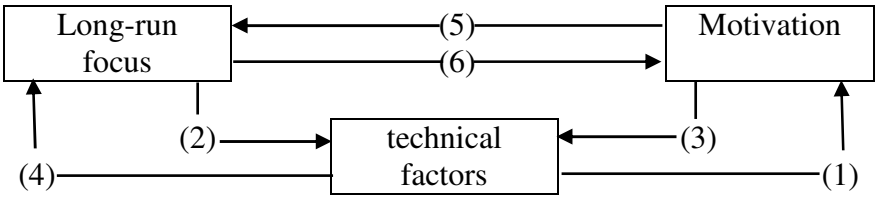


Figure 3: An integrated model of the firm:
with evidence from GM/FB vertical integration



With (1) Klein; (2) Coase, Freeland, Casadesus-Masanell and Spulber; (3) Freeland; (4) Coase, Casadesus-Masanell Spulber; (5) Freeland, Casadesus-Masanell and Spulber; and (6) Casadesus-Masanell and Spulber

Figure 4: Conceptualising firm development