TOWARD A HETERODOX THEORY OF THE BUSINESS ENTERPRISE: THE GOING CONCERN MODEL AND THE US COMPUTER INDUSTRY

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ABSTRACT

This dissertation applies heterodox concepts of the social construction and allocation of resources in the provisioning process; the organization of going concerns in societies that are themselves going concerns; and the governance of markets, and production more generally, toward a heterodox theory of the firm. It is argued that, in contrast to extant theories of the firm, the boundaries of modern firms are not the result of processes of individual contracting in the face of transactions costs, or coterminous with knowledge-based resources. Rather, they are principally the product of the coevolution of business and technological practices, chiefly in the interest of the former over the latter. It is furthermore argued that this process, in a socioeconomic system defined by the firm as a hierarchy of going concerns, is more akin to the gerrymandering of congressional districts than to an efficient allocation of material transactions between the firm and market spheres.

The history of the US software industry from the 1950s through the 1990s is provided as a case both illustrating and informing the theory. In particular, it is shown that this industry owes its structure, and indeed its existence, to the evolution of business strategies concerning the technological relationships surrounding the provision and use of computer systems. The industry's history corroborates the general hypotheses that (1) markets and firms themselves tend to be governed by the concerns operating therein; and (2) the resulting governance structures necessarily involve state sanctioning, including the administration of appropriate property rights over the relevant technological relationships.

The faculty listed below, appointed by the Dean of the School of Graduate Studies have examined a dissertation titled "Toward a Heterodox Theory of the Business Enterprise: The Going Concern Model and the US Computer Industry," presented by Erik N. Dean, candidate for the Doctor of Philosophy degree, and certify that in their opinion it is worthy of acceptance.

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to my brother

CHAPTER 1

INTRODUCTION

The nature of the business enterprise and its role in the social provisioning process have long been at the heart of discourse in economics. Economic power, institutions of property, technology, distribution and stratification, and the market itself are a few subjects which, borrowing Ronald Coase's imagery, orbit the theory of the business enterprise like constellations of celestial systems around a galaxy's center. Yet, within neoclassical theory the business enterprise itself has historically evaded theoretical consideration in its own right, as though light itself could not escape precisely that force holding economics together.

This, of course, has changed in recent decades. Since World War II, neoclassical economics has created a number of offshoots into subjects traditionally outside its scope, all the while retaining its core constructs and conclusions. There now exists a rich and diverse body of essentially marginalist thought regarding the nature of the business enterprise in modern capitalist economies. These have been collected under the heading 'theories of the firm'.

In contrast, while heterodox thought including Marxian, institutional, and post-Keynesian economics has given substantially greater attention to the organization of business and industry through firms as compared to the marginalist tradition, efforts to put forward an alternative 'heterodox theory of the firm' have been scarce (Parada, 2008). This dissertation will address this lacuna in heterodox theory by developing a going concern model of the business enterprise. The present chapter will contextualize this work in the literature of the theory (or economics) of the firm. It will argue that extant theories have certain

characteristics that leave the field wanting for analytical value within the social sciences. It will then discuss the essential components of a heterodox theory of the firm and how this project will contribute toward that end.

Extant Theories of the Firm

Defining the theory of the firm as a sub-discipline of microeconomic theory requires an inventory of the questions theorists seek to answer, or the phenomena they seek to explain, therein. This can be stated succinctly: these theories aim to throw light upon the "existence, structure, and boundaries of the firm," (Hodgson, 1998, p. 25; see also Foss, 1996) taken as the modern for-profit business enterprise. It is clear that this field of study is marked by a diversity of approaches to understanding these phenomena. Understanding this variety, as well as the disagreements and affinities between different approaches, however, requires some measure of historical context in order to understand where these questions come from and how scholars in this field seek to answer them. The history of this discipline is generally regarded to begin with Coase's seminal 1937 paper "The Nature of the Firm." However, because Coase's own purpose in this paper was thoroughly embedded in the framework of neoclassical economics, it is necessary to begin a bit earlier with the first-generation Marginalists in the 1870s.

The theories of the earliest contributors to neoclassical economics – namely Carl Menger, William Stanley Jevons, and Leon Walras – were theories of exchange, taking production as given. As Henderson (1976, pp. 135-136) has written,

> the utility theory of value initially was postulated for the determination of prices when production already had been completed, and 'bygones were bygones.' In Carl Menger's world, two farmers meet in the forest to exchange their surpluses of grain and wine, to their mutual satisfaction, each employing the incremental principle of

maximization.[1]

That production occurred by application of various inputs was not, of course, wholly spurned; it was, however, relegated to the more critical matter of, in Jevons' (1907, p. 49) words, "the natural laws according to which…distribution takes place," or as Ayres (1967, p. 11) would later characterize it, the myth "which imputes creative potency to the factors of production." In this view, all agents were in possession of some productive service in various kinds and degrees, which could be combined or transformed into salable outputs. The factor inputs would be sold to the entrepreneur in exchange for a money income in the form of rent, wages, or interest, according to kind, and to a degree reflecting the productive contribution of the service (Bharadwaj, 1994). Production was thus conceptualized as "merely a species of exchange," (Hunt, 1992, p. 345; cf. Hodgson, 1998, p. 33) in which the incomes of laborers, landlords, and capitalists alike were justified in the value of their productive services (see for instance Menger, 1976 [1871], p. 167 n.). In this manner, production and consumption became the two eminent spheres of economic theory, tied together by the marginalist logic of optimization through voluntary exchange.

In short, the neoclassical theory of the firm – i.e. the theory presented in any standard textbook – followed in form from the existing approach to individual maximization and functioned to explain remuneration to the various factors of production in accordance with their contribution to said production. The development of this theory at the end of the nineteenth century by, among others, Hermann Amstein, Francis Edgeworth, Philip Wicksteed, and Knut Wicksell (Humphrey, 1997) involved the formulation of algebraic production functions—derived from an exogenously given state of technology—that would

[1] Henderson is ostensibly referring to the exposition given in Menger (1976 [1871], Ch. IV).

come to be the eminent representation of the firm in neoclassical economic theory. These production functions would then enter into a firm's profit-maximization problem which in turn constituted both the motive and method behind firm behavior. Though there were important subsequent developments in the neoclassical theory of the firm (see Dean, 2010a), it was this general construction which Coase (1937) took as the starting point of his article "The Nature of the Firm."

In this relatively short and uncomplicated article, Coase (1937) attempted to explain why firms exist at all, if capitalist economies were to be understood as systems of pure exchange among and between producers and consumers; and, furthermore, what determines the size of firms. For this the starting point was to assume a society of only market transactions, but wherein transactions have some costs associated with carrying them out. From there the firm is organized and, indeed, defined by the profitability of circumventing the market by organizing exchanges within the firm (the matter is often characterized as the make-or-buy decision). The size of the firm is then limited by bureaucratic rigidities (or, 'diminishing returns to management'). That is, the firm will continue to grow as agents economize on transaction costs until it is no more profitable to organize exchanges within the firm than it is to buy on the market (see also Bowles & Gintis, 2000; Coase, 1988a; Foss & Klein, 2006). Thus, Coase reflected,

> like galaxies forming out of primordial matter, we can imagine the institutional structure of production coming into being under the influence of the forces determining the interrelationships between the costs of transacting and the costs of organization. (Coase, 1988b, p. 47)

Despite its seminal role in modern discourse, the article was cited only occasionally in the 1940s and, owing to George Stigler's decision to reprint it in the AEA's *Readings in Price Theory*, more in the 50s. However, it was not until the 70s and 80s that it was both

cited and discussed (Coase, 1988a, 1988b; Foss & Klein, 2006; Kitch, 1983).

It is principally from this work that the questions defining a theory of the firm today are derived. These are (1) why do firms exist – or more accurately, why is production organized within the business enterprise and not simply contracted through factor markets; (2) what defines the boundaries of the firm, how large it will grow, and so on; and (3) what defines the internal organization of a firm (cf. Foss & Klein, 2006)?[2]

Contractarian Theories

The dominant approaches to these questions within economics have received a variety of treatments and labels, however, Hodgson's (1998) taxonomy is the most cogent and parsimonious for present purposes.[3] Specifically, he groups these theories under the headings of 'contractarian' theories (or the 'equilibrium-based approach') and the competence-based approach ('resource-based' will be used herein).[4] The former, he argues, "[d]espite their differences, all...see the informational and other difficulties in formulating, monitoring and policing contracts as the crucial explanatory elements," (Hodgson, 1998, p. 26). Though Hodgson does not do this, these theories can be traced to the early theoretical response, which Nordquist (1965) termed the "utility-index hypothesis," that followed increasing recognition of the general power that large corporations have in the economy in the second

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[2] This last question more appropriately follows later developments – e.g. the evolutionary approach of Nelson and Winter (1982) to be discussed shortly.

[3] See also Best (1990, ch. 4) for an excellent comparison of the dominant approaches to the firm in economics. Best draws a similar distinction to Hodgson's between marginalist, equilibrium theories and the dynamic theories of Simon, Schumpeter, and Penrose, although Best's analysis raises issues only some of which are addressed herein.

[4] A seminal contributor to the latter approach, Edith Penrose, evidently, drew a similar distinction between transaction-costs theories and resource-based theories, though she did not see these as mutually exclusive (Pitelis, 2009, p. xxxii). The central role of transaction costs, following Coase's contributions, will be noted presently.

quarter of the twentieth century, and the critiques of the neoclassical theory of the firm that resulted (see Lee, 1984; Mongin, 1997). A brief look to these precursors of the contractarian approach may, therefore, shed some light on the nature of the approach in its present form.

The utility-index hypothesis began formally with Higgins (1939) and continued to be the most common revision of the neoclassical theory of the firm into at least the mid-1960s (Nordquist, 1965). Work in this area involved appending an entrepreneurial or managerial utility function to the output decisions of firms—connecting firm output to income and other amenities conferred to the controlling interest of the organization. Managers would direct the firm in accordance with their own utility maximization which would be unlikely to square with maximum profits. In Higgins' original exposition, the absence of perfect competition gave the 'entrepreneur' the leeway to pursue other ends, for instance prestige and leisure. In response, Lynch (1940) noted that the preferences of management were also relevant under perfect competition as, even then the so-called 'transfer cost of entrepreneurship' that makes up 'normal profits' is defined by the subjective concerns—for prestige and so on—of the entrepreneur. Higgins (1940) agreed.

Development of this approach continued throughout 1950s and 1960s.[5] Though not without diversity, the various contributions were similar in their divergence from the neoclassical theory of the firm proper but not from several of the core components of that theory (see, e.g., Cyert & Hendrick, 1972). Firm behavior was modeled as the outcome of a utility maximizing process of management. These would come to be referred to as managerial-discretion theory or managerial economics, reflecting the various goals of management central to the controlling objective function (see Williamson in Cyert & March,

[5] Papandreou (1952) and Williamson (1964) are notable examples.

1963; Cyert & Pottinger, 1979, p. 206).[6] Because these models maintained the marginalist 'tool' of optimization, they came also to be called 'extended marginalism' (see, for instance, Baumol, 1962; Lee, 1984; Machlup, 1967).

As noted above, Coase's work in this field was not taken up in earnest by the profession until the 1970s. However, Coase's postulates, and in particular the concepts of transaction costs and the firm versus market, or make-or-buy, decision, retain a level of distinction in their role in consolidating to some degree the many *ad hoc* alternatives to profit maximization of the time. Beginning in the early 1970s, many economists began dealing with business practices in terms of responses to transaction costs, and this approach brought the Coasian theory of the firm—or, as Foss and Klein (2006) have termed it, the 'modern theory of economic organization'—into the purview of orthodox analysis (Coase, 1988b, p. 35). Work in this line was substantially underway during the 1960s and 70s, falling under headings such as the 'firm-as-nexus-of-contracts' view, principal-agent theory, and the 'property-rights approach'. These arguments retained utility maximizing individuals constrained by organization structure, and emphasized transaction costs and the effects of property rights systems on behavior.

Several notable cost constructs were advanced in this regard. These included the "exchange, policing and enforcement costs of contractual activities," (Furubotn & Pejovich, 1972, p. 1141) in general. More particularly, the approach concerned itself with "the costs to the owners of detecting and policing managerial decisions and of enforcing wealth maximizing behavior," (p. 1149), where maximization of share-holder wealth became the

[6] Williamson (1963) more coherently organized the various potential goals of management, given a purported general consensus between organization theorists and knowledgeable economists. These are salary, security, dominance (status, power, prestige), and professional excellence.

proxy for the profit maximization benchmark.

By the 1980s, Oliver Williamson—whose dissertation (1964) had been a clear example of the managerial approach (Augier & March, 2001)—was writing of a unified transaction costs approach in which economic institutions were conceived functionally in terms of economizing on transaction costs. In Williamson's (1981) exposition, transaction costs stem ultimately from the bounded rationality of all individuals as well as the opportunism of at least some. Non-market organizations are thus seen as "devices by which to *economize* on bounded rationality," (1981, p. 571 emphasis in original). The character of transactions, moreover, needed to be dimensionalized in terms of, among other things, asset specificity—the argument being that where assets, including human assets, are specialized to particular transactions or parties to a transaction costs associated with carrying the exchange out through the market are to be expected.

Though the field remains diverse, the various lines of inquiry described above have all fed into a more general sub-discipline in which marginalist tools are applied to understanding the existence, structures, and boundaries of modern firms (cf. Machlup, 1967). In the same vein, Hodgson (1998) has grouped the theories of Coase and Williamson, as well as the nexus-of-contracts approach of Fama and principal-agent theory developed by Hart and Moore, together as contractarian theories of the firm. The common emphasis on contracting for factor inputs and the costs associated with organizing production is a reflection of the historical development of these essentially neoclassical lines of thought. As Best (1990) has argued, economists in the marginalist tradition have developed theories of the firm which do not require the rejection of neoclassical price theory and its underlying assumptions, and thus avoid undermining "the presumption that market prices contain all the

information required for a criterion of allocative efficiency," (p. 127).

Resource-Based Theories

Penrose (1959) and Selznick (1957) are widely credited as seminal contributors to the body of thought offering an alternative to the contractarian view of the firm (see, e.g., Best, 1990; Hodgson, 1998; Spender, 1996; Rugman & Verbeke, 2002; Walker, 2010). However, like Coase and the transaction cost approach, it was not until a number of decades later that these ideas became widely acknowledged. Yet, unlike those of Coase, their impact fell largely outside of economic theory proper.[7] Beginning in the early 1980s a body of research developed in, and came to dominate, strategic management theory aimed at understanding the sustainable competitive advantages of firms by reference to their unique resources. In this 'resource-based view' (RBV), firms acquire, create, and control resources which allow them to generate and appropriate pecuniary value over and above rival firms.

Though the RBV encompasses a number of distinct approaches, including the knowledge-based, evolutionary, capabilities, and dynamic capabilities views of the firm, some general points of agreements are commonly recognized. First, the nature of the firm is chiefly as a "repository of distinct productive (technological and organizational) knowledge, and as an entity that can learn—and grow—on the basis of this knowledge," (Foss, 1996, p. 570).[8] Moreover, it is generally acknowledged (Hodgson, 1998; Nelson & Winter, 1982) in these approaches that this knowledge is social in nature (see Conner, 1991, p. 137 on intangibles).

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[7] See Pitelis (2009, p. xxix) for possible reasons (and cf. Lee, 1984).

[8] Hence, some have emphasized 'dynamic capabilities' to note that holding competences is not always enough, sometimes firm success requires the ability to adapt competences to new circumstances (see Hodgson, 1998, p. 50).

This places these analyses outside of the static, equilibrium framework of marginalist analysis (see, e.g., Penrose, 1959). Instead, the framework is avowedly historical and may be found to be compatible with the general arguments of Chandler's business history. Indeed, Chandler (1992) argued that the chief strategy of the modern enterprises which developed in the late 1800s was the pursuit of new markets through 'creation, maintenance, and expansion' of capabilities in marketing, purchasing, product and process, and the other essential practices necessary to realize economics of scope and scale. As such, Chandler's economic history, emphasizing organizational learning and firm-specific resources, fits nicely into the RBV.

Likewise, RBV analyses "explicitly reject the *pure* contractual interpretation of the nature of the firm" (Foss, 1996, p. 570), opting instead to understand firms in terms of 'differential capabilities' where the contractarian view assumes no difference between firms in how efficiently they can produce (Foss, 1996, p. 474). While Conner's (1991) understanding may not fully cover the diversity within this approach, her explanation profitably situates the RBV within the theory of the firm literature. Firms in the RBV, as in other theories of the firm, seek above-normal returns. What separates the RBV from contractarian theories is how the problem of obtaining these returns is solved and what limits the firm's potential solutions. In this approach, above-normal returns are obtained either by selling a product with distinctive value to consumers or enjoying a cost advantage vis-à-vis competitors. The problem is, thus, how to do this without investing so much that the firm loses its above-normal returns. Distinctiveness of product is tied to distinctiveness of resources and above-normal returns are the result of rents due to these non-copyable, distinct resources.

Resource-based theories of the firm are thus capable of answering the questions posited above with different arguments than those of the contractarian theories. Firms may exist, for instance, because they promote innovation and learning more generally (Hodgson, 1998; Pitelis, 2009). Firm boundaries, likewise, are the result of growth through the internal development of the resulting resources (Penrose, 1959).

Deficiencies of Extant Theories of the Firm

Despite a clear diversity of approaches there remain a number of deficiencies in these theories of the firm. Though a thorough critique is beyond the present scope, reasoning is given here for rejecting these theories in favor of an alternative model developed from various traditions in heterodox economics.

Contractarian theories, deriving from the marginalist tradition in economics, are definitively rejected for the purposes of this project because they seek to explain the institutions in question as socially efficient. That the purpose of work in this framework is to develop efficiency rationales for the modern business enterprise is often made explicit:

> What…unites the…heirs to Coase's approach is the view that the firm should be seen as an efficient contractual entity and that this is—for understanding the issues of the existence, boundaries, and internal organization—the essential and necessary conceptualization of the firm. Property rights, incentives, and contracts occupy center stage. (Foss, 1996, p. 470)[9]

Contractarian theories suffer from the same malady that afflicts neoclassical economics more generally: an *a priori* assumption of some contemporary institutional structure—in particular the institutions of ownership (cf. Mayhew, 2000). With this assumption and the basic welfare conclusions of neoclassical economic theory, most of what

[9] It is not wholly implausible, then, that the delay in taking up Coase's simple hypotheses reflects a common skepticism amongst economists concerning the efficiency of large firms in the mid-twentieth century.

has been left to do in the way of rationalizing the economic behavior of firms has been to conceptualize this behavior in terms of costs. The ultimate source of these costs are found to be exogenous to the analysis—notably, they are due to the state of technology, to the nature and development of knowledge held by individuals, and/or to human nature itself. In this manner contemporary theories of the firm have, to the extent that they remain rooted in the marginalist tradition, shown that modern modes of economic organization are efficient responses to received costs and are thus serviceable to the community.

To elaborate, the notion that modern industrial relations within or between firms can be characterized by deliberate bargaining between individuals is anachronistic. It is a reflection of an earlier stage of capitalism in which ownership of the firm as well as the employer-employee relationship were not yet placed beyond the scope of individual arrangement by the shear scope and complexity of industrial processes and the dominance of absentee ownership of anonymously held corporate capital (Veblen, 1919 esp. pp. 43-6). Hodgson (1998, p. 29) draws a similar critique from Emile Durkheim: "All market-based and contractual systems...rely on essentially non-contractual elements – such as trust and moral norms – to function;" and from Frank Knight: given fundamental uncertainty, it is impossible to contract for needed competences. In consequence, "[c]oncerning such competences no adequate cost calculus is possible," (Hodgson, 1998, p. 39).

Furthermore, where the various species of extended marginalism focus on different governance structures, they do so in the context of given technology. This is not tenable when organizational structure affects technological change:

> [T]he ability and motivation of workers to learn will often depend on the organization of production, property rights, and so on. This reinforces the argument that production costs cannot be independent of social relations. Accordingly, an exclusive focus on the minimization

of transaction costs is misconceived. (Hodgson, 1998, p. 32)

This critique can be generalized as by Mayhew (2000) who characterizes extant theories of the firm – including the evolutionary approach Hodgson favors – as 'fixed systems' in which,

> [b]asic socioeconomic relationships are assumed to be known, defined by nature or by history or by the terms of the analysis. Firms produce and sell, consumers buy and use, states govern and regulate, workers are inputs whose labour/skills are purchased, and perhaps augmented, by firms. These relationships amount to an assumption of systemic invariance and allow analysis to begin with 'the firm', 'the state', consumers, and workers. (p. 55)

It is clear that these theories each constitute an efficiency rationale for the existence, structure, and boundaries of firms; they are not critical theories. Limitations on decision-making, monitoring, transacting, and so on define the potential outcomes of the organization, and the agents modeled merely optimize within these constraints. Social inquiry that takes as an initial premise the fundamental role of the firm is necessarily antithetical to the "cumulative and dynamic character of the continuum of inquiry, and the continuum of value," (Sturgeon, 1984, p. 605) with which heterodox economists are engaged. Hence, a theory of the firm based on the methods of heterodox economics (to be discussed in the following section) is unlikely to find much of value in these theories.

Much of the above critique is consistent with misgivings found in the RBV literature. However, this alternative approach does not, on the whole, appear adequate for producing a critical theory of the firm. While theories in the RBV typically recognize the social nature of knowledge and its importance in what firms do, they misstep in defining the firm as coterminous with and/or synonymous with this social knowledge. Hence, for instance, "it is firms, not the people that work for firms, that know how to make gasoline, automobiles and computers" (Winter, quoted in Hodgson, 1998, p. 31). Likewise, Penrose's legacy could be taken to suggest that "knowledge in general, or even a type of knowledge most suitable for

production-related activities, is engendered more efficiently within firms than without firms." If this is the case, Pitelis (2009, p. xxxiii) argues, then "everything and anything we conceive or perceive and the lens through which we do so, is predicated upon the existence and functioning of firms."

Though not explicit, this effectively conflates the social knowledge on which business enterprise depends with the institutions that define the actual organizations of modern firms. As such, explanations of firm existence, boundaries, and organization from the RBV are likely to share with the contractarian theories the presumption that capitalist institutions are effectively natural to societies. Defining the firm in terms of collectively owned or administered resources conflates the processes and effects of the development, deployment, and ownership of said resources. The result is likely to be the conclusion that the value of the firm is equal by definition to the value of the resources. This cannot provide a social theory of the modern business enterprise – that is, a theory that places these organizations within the broader social context.

Despite clearly distinct origins, the two traditions in the theory of the firm have enjoyed a considerable degree of convergence from scholars in economics and management alike. These hybrid theories typically acknowledge both the importance of firms as economizing on transaction costs as well as comprising unique bundles of productive resources. Nor should this be interpreted as an apostasy on the part of these hybridists. Recognizing the contractarian and resource-based approaches as the two dominant bases for the theory of the firm, neither Coase nor Penrose found the two wholly incompatible (Pitelis, 2009, p. xxxii).

One line of argument toward merging the two main camps has been to find the RBV

amenable to reformulation in terms of economizing on costs. For instance, the argument that boundaries are in part formed by differential capabilities can be explained in terms of communication costs; otherwise, it is argued, the firm with superior capabilities could just as easily teach another firm, rather than producing in-house (Foss, 1996, pp. 474–5)

Similarly, as Foss and Stieglitz (2010) explain, the usual method of analyzing competitive advantage in what they term the 'high church' RBV is to start with "some 'competitive imperfection'…ultimately, *some* deviation from the Walrasian general equilibrium model, or, in some formulations, from the zero transaction cost setting of the Coase theorem…leading to imperfect factor and/or product markets," (2010, p. 3). From there the high returns enjoyed by a firm are explained in terms of efficiency rents under otherwise competitive conditions (Conner, 1991; Spanos & Lioukas, 2001). These rents are derived from the firm's resources to the extent (1) that these resources are valuable, rare, and difficult to imitate, and (2) that the firm's organizational structure allows it to exploit its resources. Thus,

> resources are really collections of 'attributes,' that is services, functionalities, etc. In a world without transaction costs, all these attributes could be identified and traded, and there would be no reason to trade discrete resources. To the extent that such resources are actually traded, it is because it pays in terms of transaction costs to bundle attributes to resources. The other side of the coin is that resources are really endogenous results of economizing with transaction costs. (Foss & Stieglitz, 2010, pp. 13–4)

Along these lines, Foss (2007) has formally proposed the knowledge governance approach[10] as a convergence of transaction costs economics and the "broad interest in the management of knowledge that has characterized many fields in business administration

[10] Foss and Mahoney (2010) cite Grandori (1997) as the originator of the term 'knowledge governance'.

during the last decade," (Foss 2007, p. 30). As in the transaction costs approach, this line of inquiry seeks efficiency explanations of inter- and intrafirm organization, adding the key dimension of costs and capabilities in terms of knowledge processes—i.e. the transfer, creation, and sharing of knowledge. The definition of a knowledge transaction thus implies a new set of costs in terms of the explicitness, 'teachability', complexity, &c. of these transactions. As Foss and Mahnke (2003) argue, the explicit definition of costs involved in the knowledge processes of organizations is an important, and otherwise neglected, concept in the knowledge-management literature, and possibly the knowledge movement in general.

The above suggests that, though there is certainly no consensus within this field of research, there is a strong trend toward continuing the marginalist line of reasoning, defining, explaining, and ultimately rationalizing the existence, boundaries, structure, and behavior of firms as efficient. Although something of a simplification, the method toward this end combines the transformation cost economizing process of early marginalist production functions with the abstract distinction between firms and markets that constituted Coase's own starting point of inquiry. As a result cost as a theoretical construct has evolved to include not only the costs of factor inputs incurred by a firm in the course of production, but also transportation costs, selling costs, transaction costs, and more recently 'knowledge costs'. With these concepts in hand, theories of the firm have posited efficiency-rationale for the existence and competitive advantages of modern firms: the firm is at heart a way of organizing the activities of individuals so as to economize on the exigencies and pains of producing for future consumption. Production itself remains effectively a 'species of exchange.' As Mayhew (2000, p. 58) has argued,

> the emphases given to technological performance and innovation, competencies, the habits and routines that are part of these

> competencies, and the nature of contracting with other, often financial, firms do not hide the fact that 'the firm' is still the firm of neoclassical analysis. It has been given individuality and complexity and its bureaucratic nature has been recognized, but it retains 'production of goods' as its major reason for being, and it stands in the same relationships to consumers, to governments, to citizens, and to all other groups as the simpler neoclassical firm is assumed to have done.

All of this is by way of applying the 'myth of creative potency' (Ayres, 1967) to the business enterprise itself. The effect is to wed the institution of the business enterprise in its pursuit of profits with the interests of society more generally, to "exclude the possibility of firms...that have figured out how to go directly from money to more money without the onerous step of producing goods on the way," (Mayhew, 2000, p. 59)

Potential for an Alternative, Heterodox Theory of the Business Enterprise

The above review of extant theories of the firm and their shortcomings suggests a space for ideas from outside of the mainstream of economics. The present work is, thus, intended as a contribution toward a heterodox theory of the business enterprise, premised on the belief that a heterodox theory in this field is in need of elaboration and refinement. While many of the elements speaking to the nature and role of the business enterprise are present in the heterodox economics and related social science literatures, the collection and integration of those elements consistent with a heterodox alternative to extant theories of the firm remains a needed contribution (Parada, 2008).[11] Toward that end, a model will be constructed to understand some of the generalizable aspects of modern business enterprises, without the presumption of a general theory of 'the firm' (see Mayhew, 2000). The model

[11] Parada (2008) suggests that the (original) institutional economics literature following Veblen is particularly dispersed as compared to the Post-Keynesian theory of business enterprise, and, presumably the more orthodox approaches. The present work takes this as an opportunity to integrate contributions from both, as well as Marxian thought and literature outside of economics proper.

developed has been termed the 'going concern model' to emphasize a core idea shared among several traditions within heterodox economics (Lee, 2013a).

Such an effort necessarily requires thorough consideration and some elaboration of the central tenets of heterodox economics and the application of same to an understanding of the nature and role of the business enterprise in contemporary society. From there, it will be possible to address the more particular questions with which the theory of the firm, as a field within economics, has been concerned as well as to develop and address new questions. It is, moreover, hoped that rather than a strict alternative to extant theories of the firm in the economics and management literature, the theory to be fleshed out herein will be capable of integrating the useful insights of this contemporary work across the social sciences. Of particular note in this regard, the model developed herein may be taken to some modest degree as addressing the issues of conflict and power which have been lacking in extant theories of the firm,[12] though the model itself is not derived from these theories.

In line with critical realist and classical pragmatist methodological traditions in heterodox economics, it is maintained here that a robust theory of the business enterprise should be not only theoretically cogent, but also a reflection of actual economic behavior. For this reason, the present work includes a substantial empirical component in which the evolution of the US computer industry is analyzed through the lens of the going concern model. In developing this analysis, moreover, information gleaned therefrom has been used in the development of the model itself. Thus, the dissertation is the product of a reciprocal relationship between theoretical and empirical scholarship. As such, the model may be taken

[12] See Pitelis (2009, pp. xxxvii–xxxviii) on Penrose's neglect of the possibility of intra-firm conflict and its implications. Williamson (e.g. 1993) goes further by explicitly contrasting the efficiency-based theory of new institutional economics with power-based arguments.

as an analysis which substantially reflects the arguments of previous heterodox economists as well as the history of this particular industry. The extent of its generalizability is not presumed to be comprehensive, though a measure of robustness is hoped for.

Developing the Going Concern Model of the Business Enterprise

From a heterodox perspective, Coase's chief question, 'why do firms exist?' is an historical one. Firms exist as a result of our institutional evolution. The purpose of Coase's question, however, is not to explain where firms come from, but to justify their existence and behavior. As discussed above, this has been an essential component of most of the relatively recent scholarship in theories of the firm. In contrast to this work, a corresponding theory in heterodox economics must take a critical position on the intra- and inter-organizational relationships that define modern firms. A heterodox theory of the business enterprise will reject the methodology that identifies superficially voluntary contracting with inevitably efficient outcomes. It will furthermore approach the subject from an historical perspective, viewing the nature of the firm as bound up in the larger social fabric. A heterodox alternative must build from empirically derived concepts of how individuals organize in the pursuit of collective action and the habits of thought – knowledge and values – on which these relationships are based. Relationships, activities, and motivations in this approach are not posited axiomatically – e.g. market and extra-market contracting, production and consumption, profit and utility maximization. Rather they are gleaned from observed behavior and discourse and the social relationships these suggest and define.

Furthermore, a heterodox theory would recognize the business enterprise as a point of agency, capable of instrumental, or useful, behavior, as well as ceremonial, or wasteful, behavior. Because a heterodox theory of the firm comes to the institutions to be analyzed

with "minimum assumptions about the way in which…humans are grouped in common activity at any time in history," (Mayhew, 2000, p. 55), the serviceability of any particular organization of behavior is not a foregone conclusion. To explain, in the heterodox tradition – whether derived from the class-based analysis of Marxian economics or the Veblenian dichotomy of institutional economics – qualitative distinctions between, for instance, business and plant, commerce and industry, trade and finance are derived from contemporary and historical accounts of actual economic behavior; and these distinctions are taken seriously in developing theories of social, political, and economic relationships and their evolution.

A dichotomy is prevalent in these traditions, between relationships and behavior associated with efficiency in, and serviceability of, action, as distinct from those associated with predation, differential advantage, and "getting something for nothing" (see, e.g., Veblen, 1914, pp. 348-350). Along these lines, social institutions such as the business enterprise and their evolution can be analyzed in terms of the motivation behind, and consequences of, the behavior they condition. The firm can thus be seen, as in the capabilities approaches, as 'value creating' organizations, fostering processes of organizational learning. However, because the institutions on which modern business enterprises are founded have been carried through time and used to address problems for which they were never developed in the first place, the modern business enterprise is apt to create social costs – waste and damage resulting from unjustifiable ways of understanding and organizing economic relationships. The essential methodological premises of this dichotomy are elaborated in chapter two, along with other concepts essential to the development of the going concern model.

With this foundational work in hand, the heterodox theory of the nature and role of

the business enterprise is addressed in chapters three and four. This is done in terms of activities apparently at cross purposes with each other and with the potential serviceability afforded by the current state of the industrial arts and the arts of associated living. It is, in other words, expected that the pecuniary culture of which the modern business enterprise is an eminent part at once educates a minority of people to conduct themselves with, at best, indirect regard to the actual serviceability of their actions, and then vests, through tangible and intangible property rights, this same minority with what Veblen (1914, p. 355) termed the "usufruct of the industrial community's technological knowledge and working capacity." This is to suggest that the principal concern of a theory of the business enterprise should be the extent to which the conduct and organization of contemporary firms facilitate or hinder the use, maintenance, and expansion of this knowledge and working capacity.

To the extent that the firm is identified with activities at cross purposes with each other and the technological potential of society—that is, to the extent that the organization of economic activity around the controlling interests of the business enterprise is wasteful or injurious to society and individual—it can be said that the institution of the business enterprise involves institutional costs in terms of the analytical dichotomy discussed in chapter two. This conceptualization of a 'social cost' lies in contrast to the marginalist approach in that it is endogenously created by individuals as conditioned by the inherited institutional structure of society. Again, insofar as contemporary theories of the firm, as discussed above, are directed at rationalizing economic organization in terms of efficiency, the theory laid out in chapters three and four is expected to constitute a substantive critique and alternative. This much should be evident in methodological terms on comparison of the costs posited by these contemporary theories and the institutional costs suggested in the

methodology developed in chapter two.

The method of constructing the theoretical component of this work involved principally gleaning essential ideas from important literature, new and old, in heterodox economics, as well as from history and contemporary work in related disciplines – e.g. social psychology, accounting, and management. Works in the institutional economics and classical pragmatist traditions were taken as a rough starting point, and as such form the core of the methodological subjects in chapter two. But the overall effort developed into finding and synthesizing any ideas, arguments, and models that reinforced a model of modern business enterprises as outlined above. The work is thus an explicit contribution to interdisciplinary social theory as developed in the Social Science Consortium at UMKC (see Bowles et al., 1999).

Empirical Grounding

As noted, this theoretical synthesis has been complemented by an empirical assessment of the US computer industry in an effort to ground the model. The argument that theory must be tied to the actual behavior and relationships it seeks to explain is taken from (1) classical pragmatism, which is widely held as the methodological foundations for original institutional economics, as well as (2) critical realism, taken as the accompanying foundations for post-Keynesian theory.

As Lee (2002, p. 792) argues, what makes a theory good is how well its "explanations correspond to the historically contingent economic events being explained." Toward that end Lee advocates a circular process of theory development and empirical comparison aimed at creating core and secondary concepts, woven together into a 'conceptually dense' narrative describing and explaining actual economic phenomena. This is consistent with classical

pragmatist method as devised by C. S. Peirce, involving abduction (developing plausible explanations for the causes of observed anomalies) which "shades into perceptual judgment without any sharp line of demarcation between them," (quoted in Webb, 2007, p. 1067). In short, meaningful contributions to economic theory must be grounded in perceived events, yet perception of 'the facts' is impossible without a theoretical apparatus with which to develop, select, and interpret them. As such, economic analysis necessarily involves a constant glancing, back and forth, from the theory on canvass to the world it is intended to portray.

The empirical component of the present work, comprising chapters five and six, is submitted as a necessary grounding of the going concern model, as well as an application of this model toward understanding the growth of an important industry in recent decades. Among the several forms of case study considered by Lee (2002) it constitutes an appraisal of multiple case studies, spanning several 'eras' of the industry and several important companies, in contemplation of a number of points of theory – namely, those with which theories of the firm are concerned. Likewise, it is a historical-theoretical narrative explaining a particular set of events, "an integration of theory with the event," (Lee, 2002, p. 800).

The going concern model developed herein is intended as an abstract representation of the relationships concerned in those aspects of economic reality that touch the modern business enterprise. It is built from the core and secondary concepts derived from both the extant literature and the empirical information of the US computer industry. In consequence, it benefits from both an historically broad set of appraisals of the nature of this institution while remaining grounded in more contemporary events and thus more narrowly historically contingent. In this light it will be found to be in line with both the grounded theory method

as well as classical pragmatism (see Webb, 2007 esp. p. 1078 on models).

Finally, a few words are in order regarding the empirical work itself. The reasoning behind the choice of the US computer industry, with a particular focus on software, follows from observations made by John Dewey in the classical pragmatist tradition. Dewey argued that the experimental method of modern science has abandoned the search for "some fixed form or essence behind each process of change," (Dewey, 1920, p. 65). Instead the goal has become to "break down apparent fixities and to induce changes.... In short, the thing which is to be accepted and paid heed to is not what is originally given but that which emerges after the thing has been set under a great variety of circumstances," (p. 65; cf. Lee, 2002). In these passages can be found both the fault of extant theories of the firm (cf. Mayhew, 2000) as well as a guide to how the empirical component of the present work was pursued. Specifically, an understanding of the nature, causes, and consequences of the institution of the modern business enterprise requires observation of how this institution behaves in novel circumstances. Something more than simply a case study of the behavior of a particular firm or competitive interactions of a group of firms within a market is needed.

What is in fact needed is an analysis of a technological process and how firms and industries grew from that process, once it was made salable. That is, an understanding of the business enterprise, presumably comprised of processes of production, sale, and transformation of these processes, can be taken from observation of how these processes evolve in an environment in which the business enterprise was not initially fully formed. Computers proved suitable on this heading. This is particularly the case with computer software, which was for a considerable period of its history not treated as a salable good in itself. Observation of how firms and markets were constructed around this technology as it

came to be treated as a salable product, therefore, tells us something about what firms are and how and why they act as they do. This point is buttressed by the problems of control within the context of the extant legal mechanisms in which the software industry developed. The resulting legislative history and case law developed by government and industry has thus provided a rich set of information with which to understand the motives and means of the business enterprises and governing authorities involved.

Conclusion

To summarize the contents to follow, chapter two will discuss some of the core concepts to be used in the development of the going concern model, gleaned principally from the authors in the original institutional economics tradition. This will lay the ground work for chapters three and four, in which the model itself is advanced in some detail.

Chapters five and six, then, constitute the empirical component. Chapter five looks at the technologies involved in computers, especially software, with a focus on the relationships involved in creating and using this technology. It proceeds then to interpret the changes involved in making computer software a salable product through the lens of the going concern model. An industry-level perspective is taken here, though not without reference to specific organizations as points of agency.

Chapter six, in turn, examines subsequent developments in the industry, particularly the so-called open systems movement. This movement, occurring in the 1980s and 90s involved a significant reorganization of business practices, markets, and ultimately the legal codes which sanction mechanisms of market governance. The analysis remains essentially industry-level, though a particular company, Sun Microsystems, taken as a leader in the movement, receives special attention. Additionally, changes in copyright law in the US are

discussed in recognition of the incontrovertible role of government in this history.

It should be noted that the discussion in chapters five and six are generally given as illustrations or applications of the going concern model, perhaps implying that the chronology or causality runs from the theory to the empirical work. This is not the case. In keeping with the method described above, working out the project as a whole involved a considerable 'back and forth' between the going concern model, through which phenomena were selected and interpreted, and the development of the model itself.

The concluding chapter will provide a recapitulation of the arguments and findings of the work. Potential future research will also be discussed.

CHAPTER 2

META-THEORETICAL FOUNDATION OF THE GOING CONCERN MODEL

The foundation for the model of the modern business enterprise in this dissertation has been taken principally from the evolutionary social theory of Thorstein Veblen, John Commons, and John Dewey, having been carried through to the present by numerous scholars.[1] The present chapter lays out the primary tenets of this tradition relevant to the model to be developed in chapters three and four. Though much of this is review of the concepts and arguments of the standing literature in the tradition, some amount of new interpretation, synthesis, and amendment has been necessary to bring the congruence required to go forward with the going concern model of the business enterprise.

The concordance of the three principal authors considered here—Thorstein Veblen, John Dewey, and John Commons—has been elucidated in several places. Albert and Ramstad (1997) have brought Dewey's social psychology into accord with Commons' institutional economics. Likewise, the affinity of the works of Dewey and Veblen in general is commonly held (see, for instance, Tool, 1986 ch. 2). Yet, open questions exist which require some preliminary attention. Among these, the compatibility between Commons and Veblen was a serious point of contention in the early 1990s (see Ramstad, 1989 and ensuing debate in the *Journal of Economic Issues*). Though the present chapter will not provide a definitive response to the particulars of this controversy, it will be held throughout that the two are indeed compatible. This position is important as each made important contributions to both the methodological elements of the

[1] 'Institutional economics' or, more contemporarily, 'old' or 'original institutional economics' are likely the most common names for this tradition; however, the present work builds on the core ideas within this tradition as well as scholarship from other schools of economic thought and other disciplines. Hence 'heterodox' is used chiefly in the course of this dissertation.

tradition as well as a substantive explanation and critique of the evolution of modern capitalist society the business enterprise. To the extent that they are compatible, and indeed complementary, the framework is strengthened substantially. So far as it is relevant to elucidating the going concern model of the business enterprise, this compatibility will be examined in this chapter.

More ubiquitous in the literature, however, is the discussion, critique, and reformulation of the Veblenian dichotomy (see, e.g., Lawson, 2003, p. 175 for references). For the purposes of the present chapter, two issues are relevant. First is Lawson's (2003, p. 176) admonition that the dichotomy itself is "ultimately a consequence of a failure throughout much of old institutionalism to sustain in a consistent way conceptions of the human subject and especially social structure that are ontologically irreducible to features of human behavior." Without conceding Lawson's characterization, the following work on the dichotomy may address his concerns nonetheless by providing a framework in which the relation between individual and society is not only explicit, but of central concern.

This relationship, and in particular the analytical placement of the individual, is fundamental to the second issue concerning the dichotomy. The process of instrumental valuation, as taken from Classical Pragmatism and particularly Dewey, and the dichotomy have been taken as intimately related—at least since Foster's formulation (see, e.g., Waller, 1982). Still, Sheehan and Tilman's (1992) remonstration that Dewey's work lacked the explicit values embodied in Veblen's 'generic ends of life' appears to have gone largely unaddressed. The framework put forth in this chapter will make progress in filling this lacuna. In the process, connections to contemporary research in social psychology and motivation theory will be provided. These connections will in turn be important in the analysis of following chapters,

particularly in critically addressing the "inhuman and inefficient" characteristics of contemporary society as discussed in Sturgeon (1992).

Finally, an explicit statement concerning how the present author conceives of the dichotomy is necessary if the calls by heterodox economics, from Myrdal to Samuels and Tool (see Tool, 1986, pp. 35-36; 1993, pp. 119-120), to make 'valuational premises' explicit in social theory is to be heeded. This chapter does precisely that in the process of explicating the theoretical foundations of the model to be further developed and applied in subsequent chapters.

The starting point for this is the nature of society in general as a process, a social fabric emerging from the necessarily social conduct of its constituents—i.e. of the individuals comprising it. The general structure of this social fabric will then be developed, followed by discussion of the individual within the framework. These features will then be considered in terms of their interaction and their processes of change, culminating in the formulation of the Veblenian dichotomy referenced above.

The Joint Stock of Knowledge

The tradition considered here is that of evolutionary social theory—evolutionary in the sense that Veblen (1898b) used the term when he asked "why is economics not an evolutionary science?" and when Dewey (1909) and Mead (1936) discussed the influence of Darwin on philosophy and the potential for a 'moral science'. It is a tradition of integrating theories of humans, human behavior, and human groups with natural science (cf. Sturgeon, 1992); of analyzing discrete entities—specifically, groups of people—through time in the causal relations, or processes, constituting their development, survival, change, and disappearance. Importantly, Veblen and Commons used 'going concern' to denote this broader concept of identifiable groups

having a tendency to perpetuate themselves through time by organizing individuals toward a common purpose.[2]

At the core of this tradition is the community itself as a going concern, from which an inquiry into its internal workings in facilitating and hindering its own perpetuation follows as the guiding principle of analysis. Veblen used 'going concern' in precisely this capacity when discussing the social nature of technological – or, better, instrumental – knowledge. This knowledge, he wrote, "is of the nature of a common stock, held and carried forward collectively by the community, which is in this relation to be conceived as a going concern," (Veblen, 1914, p. 103).[3] It is this concept of the community as a whole and the processes facilitating its "continuity, congruity, or coherence," (Veblen, 1908, p. 518) which constitutes one dimension of the analytical approach of the tradition.

Veblen's "On the Nature of Capital" (1908) is the most cogent statement of this concept. In that article he explained,

> Wherever a human community is met with…it is found in possession of something in the way of a body of technological knowledge,—knowledge serviceable and requisite to the quest of a livelihood…. This information and proficiency in the ways and means of life vests in the group at large; and, apart from accretions borrowed from other groups, it is the product of the given group, tho not produced by any single generation. It may be called the immaterial equipment… (p. 518)

[2] See Atkinson (2009, p. 434) for a thorough, yet concise, definition of what a going concern is and does—though the property of self-perpetuation is omitted there. The term was likely taken by these economists from the legal and accounting principles developed throughout the nineteenth century among the railroads and the large manufacturing firms (see Chandler, 2002). In that context, the term signifies the development of for-profit companies which were intended to carry on indefinitely, and the funding and informational needs of these enterprises as distinct from their owners, creditors, and workers (see also Brief, 1966; Bryer, 1993; McWatters, 1993). Though a thorough account of this history is beyond the scope of the current project, some discussion will be provided in the following chapter.

[3] Cf. Veblen (1921, p. 53): "In point of material welfare, all the civilized peoples have been drawn together by the state of the industrial arts into a single going concern."

Variations of the concept in Veblen's work include the "commonplace knowledge of ways and means" (and the usufruct thereof), the "current technological efficiency of the community," (Veblen, 1908, p. 525), and the "joint stock of accumulated experience," (Veblen, 1921, p. 69); however, the most commonly accepted term today appears to be the 'joint stock of knowledge' (cf. Veblen, 1919, p. 56; Veblen, 1921; Baskoy, 2003) which will, for the present, be adopted. Some elaboration and qualification of this concept are provided presently.

Following the seminal statements of Veblen, the original institutional economics tradition has developed a theory of resources as derived from the community's knowledge of the ways and means of turning the material world to account. Zimmerman's (1972), as updated and expanded by Peach, is here taken as the principal account, with supplemental statements from De Gregori (1987) and Tool (1979 Ch. 5; 1986, pp. 13-14). Contrary to the static and material focus of classical and neoclassical economics (cf. Commons, 1961 [1934]), Zimmerman linked resources to the whole and continuing process by which society provisions for its own recreation—that is, to society as a going concern:

> Resources are living phenomena, expanding and contracting in response to human effort and behavior. They thrive under rational harmonious treatment. They shrivel in war and strife. To a large extent, they are man's own creation. Man's own wisdom is his premier resource—the key resource that unlocks the universe. (Zimmerman, 1972, p. 8)

Drawing on Wesley Mitchell's work (1941), Zimmerman thus concluded, "[k]nowledge is truly the mother of all other resources…"

> knowledge of petroleum and natural gas, of sulfur and helium, of chemistry and physics, the countless wonders of modern science—and the marvelous apparatus of cultural improvements which knowledge has devised and built for its own application. Freedom and wisdom, the fruits of knowledge, are the fountainhead of resources. (1972, p. 11; cf. Ayres, 1967)

Hence, the first implication of the social-level concept of the joint stock of knowledge is that from it derives, or indeed actualizes, the community's resources. Rather than a given set of material items around which society must organize itself, resources are contrivances of society itself: "Resources *are* not, they *become*; they are not static but expand and contract in response to human wants and human actions" (Zimmerman, 1972, p. 16). The material assets—that is, those corporeal items taken as objects of ownership, used as tools for production, purchased as goods for consumption, &c.—observed at any given time and place are thus subordinate to the social processes that create them, that perceive their value in use, and that permit their use to go forward. Commons (1961 [1934], pp. 659-660) concurred on this argument in his discussion of Veblen:

> The material things come and go with a rapid turnover by depreciation, obsolescence, and consumption; but that which keeps up their renewal and increasing efficiency is the traditions, customs, and innovations handed down from one generation to the next.

In this light, the joint stock of knowledge is not best understood narrowly as the technology by which a civilization produces the material necessities of life. Rather, the term may be understood in terms of the habits of thought as they pertain to both the relationship of people to the material—i.e. non-human—world as well as the relationships between people. In the preferred nomenclature, the community's accumulated experience is understood to include both the industrial arts and the arts of associated living (Sturgeon, 2009).

The organizational, or associational, aspects of the community's joint stock of knowledge bear on the issue of resources. Zimmerman, in fact, saw consumption, depreciation, and obsolescence as contributors to the destruction of resources beyond merely their material manifestations—that is, beyond the simple using-up and antiquation of the particular *artifacts* of the joint stock of knowledge. Many resources are, in their use, used up (e.g. coal). Likewise,

new technologies make old resources uneconomical, returning them to 'neutral stuff' (e.g. small pockets of iron ore upon the invention of large-scale steelworks; whale oil and kerosene). But additional reasons for resource destruction are to be seen resulting from short-sightedness, of not considering the long-run ecological consequences of our actions for the community's interest. Moreover, Zimmerman noted that "perhaps more resources are destroyed or left unborn by class struggle, internal strife, and above all, by war than by all other causes put together," (1972, pp. 14-15). The analytical implications of this will be returned to shortly.

The Structure of Collective Action

Consideration of the social fabric of any given community cannot be limited to the community-held knowledge which operates in the service of the well-being of individuals and the cohesion of the group; it also includes all habits which bear on human behavior. Thus, Cochrane (2011, p. 107) discusses,

> what Castoriadis would call the 'social imaginary signification'– the means by which the community makes sense of its world, including its mythology and religious practices, its familial organization and sexual rules, its understanding of leadership and processes of decision-making, etc.

This more general view of the social fabric can be tied in with an understanding of the community as a going concern, and with Commons' approach to institutions.

Though explicitly the community as itself a going concern was a considerably less prevalent element of Commons' work as compared to Veblen's, it was at the very least implicit, for instance, when he wrote of the expanding interdependence of individuals' consumptions and the increasing importance of confidence in others requisite to this expansion (Commons, 1968

[1924], p. 204).[4] For present purposes of exposition, however, Commons' 'collective action' taken at the level of society at large may be merged conceptually with the social fabric.

In Commons' analysis, institutions are defined as "collective action in control, liberation and expansion of individual action," (Commons, 1931, p. 649). Control over individual action denotes the necessity for individual habits to conform to the expectations of the concern; liberation denotes protection from the deleterious actions of others; and expansion denotes "expansion of the will of the individual far beyond what he can do by his own puny acts," (Commons, 1961 [1934], p. 73; see also Commons, 1931; 1968 [1934], p. 68).

In its more universal, unorganized form, this collective action is known as custom; as it becomes more organized it forms going concerns "such as the family, the corporation, the holding company, the trade association, the trade union, the Federal Reserve System, the 'group of affiliated interests,' the State," (Commons, 1961 [1934], p. 70) and the working rules that control, liberate, and expand individual action by sanction of the concern.

Working rules connect the going concern as a discrete entity and the individuals constituting it without identifying the concern with any set of given individuals. Working rules thus come to signify membership in a going concern, though the rules themselves "keep on working regardless of the incoming or outgoing of individuals," (Commons, 1968 [1924], pp. 135-136). Commons continued,

> Each concern is, indeed, a government, employing its peculiar sanctions, and each individual holds a position or job in many governments. He is a citizen of the state, a principal, agent, employee, creditor, debtor, of a business concern, a father, son, brother, fellow-communicant, comrade,

[4] A social-level notion of the going concern is difficult to find in Commons as his theory largely revolved around the multiplicity of going concerns in modern society. The "body of society as a whole" from which "each concern springs up…through a process of differentiation," (Commons, 1968 [1924], p. 320) is the nearest instance of which the present author is aware.

> and so on, of the various cultural concerns. (Commons, 1968 [1924], p. 321)

Going concerns, working rules, customs, and positions are all of the nature of collective action, and are all subject to evolutionary analysis in terms of processes, as opposed to the analysis of quantities of material things or the incoming or outgoing of particular individuals (see esp. Commons, 1968 [1924], p. 135). The argument is evident throughout Commons' *Institutional Economics* (1961 [1934]). It is likewise present in Veblen's approach, and, in particular, in his discussion of problems within economic theory in categorizing as productive, distributive, or consumptive classes of people rather than classes of employments (Veblen, 1901, p. 206).

Commons' working rules, custom, going concerns, and positions represent the institutional structure, the social fabric, by force and by means of which people act, and fundamentally by which people are defined as social creatures. They are institutions attaching to the going concerns of which people, holding positions within these concerns, are members. The going concerns in turn are defined by the larger institutional structure in which they are embedded, ultimately coming to the community as a whole, itself a going concern. There is thus found a compatibility between Commons' institution—defined as "collective action in control, liberation, and expansion of individual action"—and Veblen's "settled habits of thought," all of which is denoted here in its most general sense as the social fabric.

Dewey similarly defined customs as "widespread uniformities of habit," (Dewey, 1922, p. 58), suggesting that this concept, habit, is of central importance to the nature of the institutional fabric. In fact Dewey places habit as the central force in human behavior. To his social psychology, and in particular the role of habit therein, we now turn in order to situate the individual in the wider social structure.

Psychological Foundations

Up to this point the exposition has been concerned with the social processes by which any human community is organized. What is still to be seen is how precisely the individual fits into the analysis. This section and the next will begin with individual conduct and the social psychology with which it is understood, and then move back toward the social fabric in which this conduct is situated and upon which it is reliant. The place of the individual in evolutionary social theory is important for understanding the relationship of psychological and social theory, evidence, and method. On this account, Dewey's social psychology as laid out in *Human Nature and Conduct* (1922) constitutes the seminal work.[5]

As Albert and Ramstad (1997, p. 892) note, both Commons and Dewey took habits "to be of cardinal importance in accounting for the content of individual activity." Habits, according to Dewey (1922, pp. 14-17), are adaptations of the individual to the environment, an organization of ends into the means by which they are achieved (see Albert & Ramstad, 1997, p. 889; Dewey, 1896); they include not only the arts by which we turn the material world to account, but our moral dispositions as well. Moreover, because the individual's environment is necessarily social, conduct is necessarily social in nature. Dewey was clear that habits, whether of speech, morality, or any other facet of conduct, are in large part inherited from the already-habituated social group into which the individual is born. "The nature of habit," is thus "to be assertive, insistent, self-perpetuating," (Dewey, 1922, p. 58) through generations.

[5] The present section will focus on Dewey's work and its compatibility with contemporary social psychology research. A later section will also discuss Veblen's 'generic ends of life' in relation to these arguments. Geras' (1983) reading of Marx suggests a number of important similarities as well. However, exploration of these connections is beyond the scope of the present work.

An essential word in the preceding definition is 'adaptation'—particularly in terms of a relationship between the individual and the environment, both social and material, through which social conduct and individual personality are perpetuated. Habit is not only the stuff institutions are made of, as suggested in the previous section; it is also the primary effector of individual conduct. The concept is, then, the means by which the individual and the social are analytically wed.

Still, the social nature of habit does not preclude the existence of processes innate to the individual. These native capacities, which Dewey termed impulses and Veblen called instincts (but see Dewey, 1922, p. 105 n.), constitute the evolutionary heritage of the species that manifests in, and is given meaning by, habits. It is, however, worth cautioning here that these impulses do not directly effect behavior; nor should they be identified with observed institutions—e.g. the 'instinct of war' (Dewey, 1922, pp. 109-115). Rather, impulses provide the human stock on which habits act and the criterion by which habits are said to adapt conduct to a given situation: "Impulses are the pivots upon which the re-organization of activities turn, they are agencies of deviation, for giving new directions to old habits and changing their quality," (p. 93). Dewey notes,

> In conduct the acquired [habit] is the primitive. Impulses although first in time are never primary in fact; they are secondary and dependent. The seeming paradox in statement covers a familiar fact. In the life of the individual, instinctive activity comes first. But an individual begins life as a baby, and babies are dependent beings. Their activities could continue at most for only a few hours were it not for the presence and aid of adults with their formed habits. (1922, p. 89)

As such, "the development of native impulse must be stated in terms of acquired habits, not the growth of customs in terms of instincts," (p. 91). To avoid confusion in this regard, and to connect these psychological foundations with contemporary research in social psychology falling

under the heading of 'self-determination theory,' (SDT)[6], the term 'psychological need' will be used instead of impulse or instinct. Logically this changes nothing for the analysis in terms of the individual. The adaptation of social habits and innate processes to ever-changing situations is of chief concern; whether these innate processes are considered in terms of proclivities manifested in or suppressed by habits, capacities realized or neglected in habits, or needs satisfied or thwarted in consequence of habits is immaterial. Indeed, Dewey hinted at this synonymy in discussion of a 'proprietary impulse' and a 'need for appropriation' (1922, p. 117).[7] In short, the issue is of expression or non-expression[8] of an innate process in habit. The relationship between habit and need becomes clearer in elaboration of the problematic situation.

If the effect of habits is to provide the continuity of individual conduct, the result of conflicting habits or new situations to which habits are no longer adapted must be some degree of obstruction to conduct, a problematic situation. The result, in Dewey's analysis, is deliberation, "a dramatic rehearsal (in imagination) of various competing possible lines of action," (Dewey, 1922, p. 190). The resolution of this process—that is, choice—is then "simply hitting in imagination upon an object which furnishes an adequate stimulus to the recovery of overt action," (p. 192). New habits are formed, or old ones reorganized, and the continuity of conduct is recovered. 'Continuity of conduct' is, then, to say that habits have adapted, or organized, individual and environment sufficiently for action to proceed.

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[6] See Deci & Ryan (2000) for an overview.

[7] The validity of a so-called instinct of acquisition or anything of the like is not entertained here. The only aspect of the passage considered is the interchangeability of 'impulse' and 'need'.

[8] The concept of a psychological need in the SDT literature is, like Dewey's impulse, a processual concept in which any particular need may be associated with a variety of motivations, reflecting the relationship between innate—that is, inherited and transcultural—individual processes and social habit.

Here the role of needs, or Dewey's impulses, is not inconsequential:

> The eye hungers for light, the ear for sound, the hand for surfaces, the arm for things to reach, throw and lift, the leg for distance, anger for an enemy to destroy, curiosity for something to shiver and cower before, love for a mate. Each impulse is a demand for an object which will enable it to function. Denied an object in reality it tends to create one in fancy, as pathology shows. (Dewey, 1922, p. 140)

This is to say that habits received through enculturation and deliberation can be seen in terms not only of the *continuity* of conduct, but also the *quality* of conduct. In consideration of the latter, Dewey suggested that habits not adequately inline with the individual's nature are liable to diminish well-being and development: "An organization of impulse into a working habit forms an interest. A surreptitious furtive organization which does not articulate in avowed expression forms a 'complex'," (1922, pp. 164-165).

Contemporary research in social psychology substantially confirms Dewey's argument. Theoretical and empirical research in self-determination theory[9] has found that experiences in which psychological needs are satisfied, or expressed, are associated with relatively greater outcomes in well-being.[10] These experiences are considered adaptive organizations of acquired motivations and innate psychological needs. Likewise, maladaptive motivations, those that neglect or thwart psychological needs, are associated with ill-being (Deci & Ryan, 2000).

Moreover, researchers in this field find that these patterns of behavior often lead individuals to develop rigid behavior patterns and substitute motives, which in turn diminish the

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[9] A well-organized resource on this approach to motivation theory can be found at http://www.selfdeterminationtheory.org (as of April 2013).

[10] Note: well-being is here used as eudaimonic (as opposed to hedonic) well-being—that is, "not so much an outcome or an end state as…a process of fulfilling or realizing one's daimon or true nature," (Deci & Ryan, 2008, p. 2). See the special issue of the *Journal of Happiness Studies* (2008), Vol. 9, No. 1 for further discussion.

likelihood of future need satisfaction (Deci & Ryan, 2000, pp. 248-252).[11] In the positive formulation, the relationship between habit and need becomes not only the satisfaction of the latter by virtue of the former, but also a flexible and intelligent character in present habits toward the resolution of future conflict and the expansion and enrichment of future activity (cf. Deci & Ryan, 2008). In Dewey's terms, the matter is of "activity…bringing along with itself a release of further activities," (1922, p. 143), of "continuous, vital readaptation," (p. 240). The continuity of conduct which, it can be said, habit controls and expands is thus not merely a matter of present adaptation, but also of future *adaptability*; the satisfaction or neglect of innate needs becomes relevant in the quality of conduct both in the present and the future in this same manner.

The concept of habit is thus a central analytical construct in the framework at hand. The social fabric is comprised of habits commonly held[12] in positions, going concerns, or the community at large. Habits are the stuff collective action is made of, the primary means by which people act in concert as well as the essential points of conflict. Yet habit is also the central means of individual conduct, an adaptation of organism and environment. And through this notion of adaptation, innate human needs, as manifested or satisfied, or suppressed or thwarted, in the conduct which habits direct become analytically relevant. Habit thereby stands as the junction between the social and the individual, bringing the two under a single analytical framework.

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[11] Further comparison with Dewey is facile. Consider the following statement: "The evil of checking impulses…resides in a refusal of direct attention which forces the impulse into disguise and concealment, until it enacts its own unavowed uneasy private life subject to no inspection and no control," (Dewey, 1922, pp. 165-166).

[12] It may be necessary to note that 'commonly held' is not intended to suggest that these habits do not act to rank individuals, ideas, objects, and so on and apply different values and actions accordingly—that is, their 'commonality' does not suggest an application resulting in equitability or anything of the like. It is also not to suggest that the social processes denoted by 'social fabric' are reducible to discrete habits in the minds of particular individuals.

Knowing-Doing-Valuing and the Public Purpose of Concerns

Having discussed the psychological foundations by which the analysis weds the individual to society, the task at hand becomes to apply this understanding of habits of thought to the structure of collective action. In the course of his exposition on social psychology, Dewey rejected the mind-body dualism that separated knowledge from action as well as the distinction that made values a province distinct from knowledge (cf. Ayres, 1996 [1944]). Freed of these dualisms, it becomes clear that behavior, conduct as governed by habit, is constituted by ways of knowing, doing, and valuing (Sturgeon, 2009, p. 41).[13] Knowing establishes what has happened, what is happening, and what is expected to happen depending on what is done; it looks to the future in order to inform the choice of present means in attaining ends-in-view (cf. Dewey, 1922, p. 267). Valuing appraises the quality of present choices and future consequences. Taken together, the two establish what is best to do now—though they are in fact simply a part of present 'doing'.

Atkinson (2009, p. 435) notes, "humans act in the present in anticipation of expected consequences of those actions. Those expectations, however, are shaped by customs that shaped our collective institutions. These customs provide some stability even as our present actions create a different future." Thus, conduct as knowing, doing, and valuing is not a matter of atomistic decision-making through perpetual 'lightning calculations' (Veblen, 1898b), but a social process carrying the past into the present and creating the future. Hence, the aggregate of the community's rules, customs, and knowledge—the social fabric—is comprised of habits of knowing, doing, and valuing. The character of this integrated process determines the continuity and quality of *conduct* just as it facilitates the continuity and congruence of *association*.

[13] Cf. Veblen (1898a, p. 192): "Man's life is activity; and as he acts, so he thinks and feels."

As suggested by Atkinson (2009), drawing on Commons' concept of futurity, this socially embedded behavior is substantially a matter of expected future consequences. Futurity indicates "anticipation, or, literally, the act of seizing beforehand limiting or strategic factors upon whose present control it is expected the outcome of the future may also be more or less controlled, provided there is security of expectations," (Commons, 1961 [1934], p. 58). Thus, again, present conduct becomes an integrated process of knowing, doing, and valuing, based in experiences of the past, taken as a collective matter. Values and knowledge come from the past through deliberation and enculturation and color the choices made in present action. Valuing and knowing are inherent to present doing, all of which look to the future, either for the sake of carrying present trends forward or bringing about new conditions, potentially in which the meaning of activities is expanded. Habit thus carries the social-individual process from the past into the present, where this same process shapes the future, and in doing so shapes itself.

Here, as in what has preceded, the institutions—that is, collective action, common habits of thought, culture, working rules, custom, or simply social processes—take primacy over material things and particular individuals (cf. Commons, 1961 [1934], esp. pp. 406-407). In terms of the relationship of individual conduct and going concerns, it is the expectation of future transactions afforded by these institutions that allows for the coalescence of individual conduct in a going concern. These institutions, or collective action, by necessity facilitate the continuity and quality of individual conduct because humans are by nature dependent upon others to live. Hence, the continuity of conduct that manifests in a more or less harmonious organization of habits and impulses extends analogously into more complex forms of organization, beyond the individual and into concerns and communities. So too do the occurrences of problems in stalled

action due to conflicting processes, as well as the process of deliberation in which these problems might be overcome.

The transactions of which going concerns are comprised are characterized by (1) an interdependence between their constituents, (2) a reasonable expectation that transactions will repeat with some degree of similarity, and (3) conflicts of interest, or at least the potential therefor (Commons, 1961 [1934], pp. 57-58). These are here considered to be matters of the continuity and congruence of going concerns. It is thus necessary to examine those ways in which the perpetuation of the concern is facilitated and the ways in which it is hindered.

Though not merely the aggregation of the particular constituent individuals, a going concern acts by virtue of the conduct of specific individuals. These individuals act generally in accord with the working rules of the concern, and are members of the concern by virtue of this; however, their conduct is not merely a by-product of these rules, but the processes by which these rules are created, maintained, and altered. That is, the position which an individual holds is "both a function of a concern and a function of a person," (Commons, 1968 [1924], pp. 368-369); it is not only socially defined through working rules and custom, but a point at which the individual exercises human agency.

The 'will' of the concern—what Commons called its 'public purpose'—is the 'composite will' of its members "to the extent that each has any discretion in his acts," contributing, that is, "in different degrees to determine the collective will," (Commons, 1968 [1924], p. 146). The public purpose is "none other than the working rules of the concern operating through the actions and transactions of those who observe the rules" (p. 147). The habits that are defined by, and that define, the concern inform the valuing and knowing of members, and therefore determine doing *within* the firm, and therefore doing *by* the firm. The public purpose of a concern is thus

an emergent process analogous to, but not identical to, individual conduct. Concerns behave according to processes of knowing, doing, and valuing that emerge from the interaction of individuals holding positions and the working rules that define the positions and guide their interaction. In this respect, the adaptation and adaptability of the concern's public purpose becomes a matter of the *continuity* of the concern and the *congruence* (or lack thereof) of its constituents that facilitates (or hinders) this continuity.

Because the continuity and congruence of a concern relies on the organized conduct of its members going forward, the capacity to enforce sanctions for non-conformity and to resolve conflicts among members is required. This latter process, analogous to deliberation in Dewey's social psychology, was for Commons the function of the judiciary—a particular position in a concern, or the public purpose of a particular concern in a hierarchy of concerns—in interpreting the working rules relevant to a particular instance of conflict. Commons thus concluded that it is "in the decision of the judicial functionaries of each concern…that the economist must look for the concern's purpose, that is the 'public' purpose of the concern." (Commons, 1968 [1924], p. 321).

In summary then, Commons developed a,

> theory of a going concern…having its roots in the past, its behavior in the present, held together by the hopes of peace, wealth and the fears of violence, poverty and vice, through the control of which collective action proportions the inducements to individuals to participate in the burdens and benefits of collective power. (1968 [1924], p. 361)

Because this theory includes individual conduct as an important component, it can be supplemented with Dewey's treatise on social psychology. In this manner the collective action—or settled habits of thought, institutions—which constitutes the social fabric and organizes the same into custom, going concerns, and positions constitutes the very same processes that organize individual conduct. Collective action and individual action are mutually

constitutive by virtue of these processes; they define and are defined by the knowing, doing, and valuing inherent to individual conduct and the public purposes—the knowing, doing, and valuing—of concerns.

Finally, evolutionary social theory, as a process of inquiry necessarily embedded in the milieu in which it seeks to understand, requires the interpretation of the character of these institutions by evaluating their consequences in facilitating and hindering present adaptation and future adaptability of a community's going concerns, resolving ultimately to the community itself, as well as the individual conduct from which they emerge. This evaluative method, commonly referred to as the Veblenian or analytical dichotomy, is the subject of the next section.

The Veblenian Dichotomy

The Veblenian dichotomy is sufficiently prevalent in the literature to make a comprehensive review unnecessary here.[14] Commonly, and by way of example, the distinction is made between institutions of, characterized by, or based in business versus industry, acquisition versus production, the vendibility of goods versus their serviceability, invidious rank versus non-invidious community, and so on (see Tool, 1986, pp. 36-37).

More analytically focused, the dichotomy has been defined as a distinction between past-binding, discriminatory beliefs, habits, and so on versus those based in matter-of-fact apprehension of problems and their effectual solutions (Ayres, 1996 [1944]; Sturgeon, 2009). Social processes of knowing, doing, and valuing are identified as either *instrumental*, i.e. deriving from "sequences of cause and effect, understanding of consequences, warranted experimental/scientific knowledge, trial and error, and instrumental logic," or *ceremonial*, "validated by processes comprising myth, legends, and traditions," (Sturgeon, 2009, p. 40). The

[14] See Waller (1982) and Samuels (1977) for analyses of the historical variations in the concept's formulation.

distinction becomes critical for social analysis when it is seen that instrumental patterns of behavior are adaptive to new circumstances and knowledge, whereas ceremonial patterns tend to become increasingly obsolescent and obstructive over time. A tension thus forms in the value structure of society where instrumental and ceremonial processes of knowing, doing, and valuing coexist (Sturgeon, 2010).

This formulation of the dichotomy has been criticized by Lawson (2003, 2005), who reads 'dichotomy' itself as a strict categorization of institutions as either rigid or static social processes or those that are progressive or dynamic. Lawson speaks of the failure of the dichotomy so characterized as lying in an inadequate treatment of social structure and human agency. Explaining that all social structures involve processes of reproduction and/or transformation and that these structures have causal impact through mediation of human agency, he argues that the standard conceptualization of the dichotomy is misguided.

To be sure, it would be inappropriate simply to divide society into static, un-scientific, and therefore regressive ceremony on the one hand, and dynamic, scientific, progressive technology on the other. This strict distinction would tend to suggest an ascription of all that is ill in society to un-scientific thinking, and all that is well to technology. Yet, Pompeii was not made a tomb by the inflexibility of culture; nor did the bombings of Hiroshima and Nagasaki mark great advances in human 'civilization.' In a world in which nothing is permanent, where change can occur in every facet through intent, accident, or so-called acts of God, the Veblenian dichotomy must be more than simply a division between static and dynamic if it is to have any evaluative use.

Lawson's characterization of the dichotomy is decidedly inaccurate as regards the bulk of scholarly work in the tradition. However, his call for explicit ontological statements of social

structure and process and human agency provides an opportunity to strengthen this core analytical device. Once it is accepted that everything changes and that change is not necessarily an exclusively social product, it can be seen that the Veblenian dichotomy deals with the role of individuals, organizations, and society *in* these changes as well as the consequences of such. This role is principally in the processes of both individual and social deliberation—viz. involving both human agency and emergent social processes. These can in turn be characterized in terms of effectively confronting and resolving the problems encountered versus the failure to do so by avoidance, delusion, perpetual conflict, and so on. The former characterization is denoted as 'instrumental,' the latter, 'ceremonial.' Though not accepting Lawson's characterization of the extant literature, the framework elaborated above and the discussion of the dichotomy to follow is thus in agreement with his ontological exposition.

The present elaboration will integrate the common formulation of the dichotomy in terms of (1) community adaptability (versus the lack thereof) by way of flexible habits guided by warranted knowledge (versus ceremonial adequacy) with (2) the adaptability of individual conduct dealt with in Dewey as well as contemporary research in social psychology. It is in this respect an extension of the arguments made in Sturgeon (1992) for an "integration of a theory of artistic experience" to "improve the Veblenian dichotomy" and to "help shed light on the genuinely humane nature of that analytic structure," (Sturgeon, 1992, p. 358). It is, moreover, an answer to the call for more explicit value statements rooted in what Veblen called the 'generic ends of life' (Sheehan & Tilman, 1992).

Continuity, Quality, and Congruence

What is required is a formulation of the dichotomy in terms of the structure of collective and individual action given in the preceding sections of this chapter. In the most basic terms, it

evaluates the facilitation and hindrance of the perpetuation of individual conduct and the settled habits of thought which control and expand it. The two facets of this process by which a community perpetuates itself in this model are the *continuity and quality of individual conduct* and the *continuity and congruence of collective action,* chiefly through going concerns.

As stated above, humans are social animals by nature. It is only through collective action, manifested in explicit rules and organizations as well as unorganized custom that the meaning and value of individual conduct, and the power it enjoys, is expanded. The continuity of the community at large, as well as the congruence of its members acting together, is therefore as much a logical requirement for the perpetuation of individuals as the life and health of the latter are required for the existence of the community they comprise.

However, the expansion of individual conduct that is part and parcel of an expanding joint stock of knowledge will generally be accompanied by an ever greater potential for the community to work against itself in terms of both its own continuity and the interests of its constituents. This potential was noted by Veblen (1898a) in discussing the convention that sees serviceable labor as ignoble in spite of a recognized 'instinct of workmanship' common to the species. There it was argued that, by virtue of the consistency of humans with the evolution of animals more generally, an aversion to useful work could only have occurred once industrial arts were adequate to allow some to habitually avoid this work, pursuing instead activities of exploit and predation.

The potential is clearer, however, on consideration of the nature of the joint stock of knowledge itself. In discussion of more recent times, Commons noted that,

> Everything which [a person] consumes passes first through the hands of many other persons, and each person depends on predecessors to select the best of the elementary utilities, to give to them the best form and to bring them regularly to the needful places. As this interdependence enlarges

> with commerce, the ignorance of each individual enlarges, and each depends more and more on confidence in the honesty, diligence, promptness and good management of others. (Commons, 1968 [1924], p. 204)[15]

These latter traits—honesty and so on—denote the arts of associated living that facilitate stable collective action through time and the growth of the same. They are ways of knowing, doing, and valuing facilitating the conduct of individuals. At hand, then, is simply the interdependence that characterizes human society, which expands with the joint stock of knowledge and the concomitant enlargement of individual ignorance.

If parts of the institutional milieu can be identified as *facilitating* organizational stability and effectual conduct then, failing utopia, there will be found parts that *hinder* as well. With the expansion of knowledge, and therefore ignorance, develops the possibility of limiting access. For various reasons, a community's institutions, which depend upon participation for present execution and future adaptation, may develop so as to favor some individual, position, concern, or grouping thereof in terms of the control of others. One of the most common examples in this regard is the development of property rights with which some portion of the community would

> engross, or "corner," the usufruct of the commonplace knowledge of ways and means by taking over such of the requisite material as may be relatively scarce and relatively indispensable for procuring a livelihood under the current state of the industrial arts. (Veblen, 1908, p. 525)

This limiting of access to the joint stock of knowledge implies a disjunction in the collective aims of the community—those with property move to secure and exploit their rights while those without are compelled either to find alternative means of provision for themselves, or to come to an agreement with the property holders. While property relations will occupy much of the discussion in subsequent chapters, it is enough here to point out that institutional evolution often

[15] The impossibility of any individual or small group to encompass the whole of the community's accumulated knowledge is noted also in Veblen (1908).

sets portions of the community to work at cross purposes and thereby diminishes the congruence of the community as a concern, potentially jeopardizing its continuity as well.

Social conflict manifests in problematic situations, if only in the curious mind of the 'impartial observer.' Likewise, conflict is resolved by virtue of the deliberative processes, both collective and individual, which allow conduct to go forward. In this way, the continuity of individual conduct is inseparable from the continuity and congruence of the community. However, as discussed above, whether the resulting organization of individual conduct constitutes an expansion of capacities as opposed to a suppression of the same is not ensured. A worker denied access to the usufruct of the joint stock of knowledge, for instance, may negotiate a wage-bargain which leaves him confined to meaningless repetition, segregated from participation in the direction of the wider collective action. Because of this it is necessary to consider the following and how they are interrelated: the continuity of the community and its going concerns in terms of adaptation to present circumstances and adaptability to future contingencies; the harmony or congruence (versus conflict) of its constituent's purposes and conduct; and the quality of the conduct of individuals in terms of well-being and development—that is, the harmony of habits and capacities, needs, or the pathological lack thereof.

These harmonies and conflicts are here approached in terms of the Veblenian dichotomy. To the degree that institutions are identified as promoting or facilitating the continuity and congruence of a going concern, they are said to have an *instrumental* characteristic. Those identified as hindering or disrupting this continuity and congruence—that is, processes of conflict, conduct working at cross purposes—are said to have a *ceremonial* characteristic. These are the meanings of 'instrumental' and 'ceremonial' in terms of the social facet of habits

On the individual side, the distinction is drawn analogously in terms of the continuity and quality of conduct. Thus, in terms of the individual and the positions that tie them to various concerns, 'ceremonial' denotes need-thwarting habits and motivations, while 'instrumental' denotes those ways of knowing, doing, and valuing which satisfy needs or have the ability to do so. Dewey hinted at this approach in considering child development:

> [T]he intimation never wholly deserts us that there is in the unformed activities of childhood and youth the possibilities of a better life for the community *as well as for individuals here and there*. This dim sense is the ground of our abiding idealization of childhood. For with all its extravagancies and uncertainties, its effusions and reticences, it remains a standing proof of a life *wherein growth is normal not an anomaly, activity a delight not a task, and where habit forming is an expansion of power not its shrinkage*. (Dewey, 1922, p. 99 emphasis added)

From this perspective, the dichotomy is more than a distinction between scientific knowledge and myth, it is a tool with which we may understand the processes by which society succeeds or fails to organize activity to meet the exigencies of life *as well as* the implications of this for the well-being and development of the individuals comprising society. As suggested by Dewey, and corroborated by contemporary research in social psychology, this well-being and development of the individual is a matter of intrinsic value in present action and expansion of activities in the future. Tool (1986, p. 39) argues for a social value criterion having much the same effect: society should act to "'increase the meaning of present experience'…to understand the way in which present experience connects and relates to past experience and will relate and connect with future experience."

The preceding point is, in part, intended specifically to address Sheehan and Tilman's (1992) argument for the need to connect instrumental value to Veblen's 'generic ends of life' embodied in the instinct of workmanship, the parental bent, and idle curiosity. As discussed earlier, instincts or impulses from the seminal works of both Veblen and Dewey can be

reformulated in terms of basic psychological needs. In this manner, the framework is connected to the social psychology literature positing a set of such innate, transcultural needs. Indeed, on closer examination of the texts of Veblen and the contemporary social psychologists, there appears to be a great deal of agreement in terms of the particular needs/instincts found to be common to the species. Though not mapping precisely, Veblen's instinct of workmanship and parental bent are found to be amenable to self-determination theory's needs for competence and relatedness. Veblen's idle curiosity and self-determination theory's need for autonomy also figure as compatible in the framework presently proposed. (For more, see Conceição & Dean, 2010; Dean, 2010.)

That Veblen considered his generic ends of life important to his social analysis is clear: "These native proclivities alone make anything worth while, and out of their working emerge not only the purpose and efficiency of life, but its substantial pleasures and pains as well," (Veblen, 1914, p. 1). Self-determination theory buttresses this by explicitly defining these ends in terms of the health and development with which their satisfaction is associated (Deci & Ryan, 2000; Sheldon, 2004). Thus, more than simply a fortuitous affinity between the seminal works of the tradition and contemporary research, the connection is important in that it provides a route by which the quality of conduct, in terms of individual well-being and development can be examined empirically.

Individual and Collective Dimensions of the Dichotomy

The two approaches to the instrumental-ceremonial dichotomy given above are connected in terms of the continuity of collective action and of the conduct that comprises it—that is, in terms of habits. Because collective action is comprised of common habits of thought, and because these habits are the means by which individual conduct can go forward, the continuity of

collective action and of individual conduct depends on the suitability to present exigencies of the common habits of thought, the social fabric. This is true both in terms of present adaptations of the organization of individual conduct and collective action, as well as the future flexibility of each. Some present set of institutions may be found to be well-suited to present situations but nonetheless denote ceremonial characteristics insofar as they (1) are incapable of fitting themselves to new circumstances and/or (2) hinder the growth of future conduct in terms of the expansion of the meaning of activities. Thus, the terms 'instrumental' and 'ceremonial' must be considered along several dimensions: present as well as future adaptation, and individual as well as collective coherence.

To elaborate further, the term 'ceremonial' denotes fundamentally the indication of a failure of the social deliberative process to reconcile conflict between and among individuals, positions, and going concerns given received habits of thought. It denotes a lack of present adaptation relative to perceived potential for reconciliation, cooperation. To say an institution has ceremonial characteristics is to identify conflicting habits of knowing, doing, and valuing. The term denotes not a dialectical opposition to the interests of efficiency, solidarity, group cohesion, &c. but the existence of *conflicting processes within the habits of the group itself*. In this way, once-generally settled habits of thought become fractured as new habits lead to the allegation that old habits have become obsolete. Thus, the process of identifying institutions as ceremonial in character is one and the same as Kapp's analysis of social costs:

> [Social costs] are damages […] which under different institutional conditions could be avoided. For, obviously, if these costs were inevitable under any kind of institutional arrangement they would not really present a special theoretical problem. […] [T]o reveal their origin the study of social costs must always be an institutional analysis. Such an analysis raises inevitably the question of institutional reform and economic policy which may eliminate or minimize the social diseconomies under discussion. (quoted in Berger, 2009, p. 59)

Veblen's champions in this regard were the engineers. Possessed of an eye toward efficiency and 'matter-of-fact' causal relationships, and working in accord with instincts promoting serviceable action, these individuals' habits of thought come into logical conflict with the prevailing institutions of business and property. Veblen then extended this perspective beyond the limits of the going concern in which the initial conflict between businessman and engineer exists, considering the ramifications for the wider community. In this manner he concluded, though not by formal recourse to the dichotomy, that the view of the engineer was in relatively greater—that is, more directly in—conformity with the continuity, the 'life process', of the community as a going concern; whereas the businessman's view often amounted to a hindrance to this process. [16]

In terms of resources, ceremonial processes are thus wasteful and destructive in that they 'use them up' when it is seen that they need not. But more fundamentally this waste and destruction is a delay—the forcing of a circuitous route when the more direct is known—or of outright abandonment. This is the case because, though resources may be destroyed, the community's immaterial equipment—those habits of knowing, doing, and valuing capable of sustaining the group as a going concern—remain substantially intact.

To individuals ceremonial institutions are characterized by exclusion, obstruction, denial of service, warrantless damage to well-being, a hindrance on development, or the threat thereof. This threat is not merely against the interests of the individual; to the extent that the continuity and congruence of the community relies on the continuity of individual conduct, the stability and existence of the community itself is jeopardized (Cochrane, 2011, p. 107).

[16] Commons (1961 [1934]) carried this forward in his distinction between the going-business and the going-plant. This will be taken up in the next chapter.

However, the absence of conflict in the present does not denote instrumentality as a sort of static perfection. As Hickerson (1987, p. 1136) argues:

> While specific institutions may perform in service of instrumental value at a particular time and place, they tend to become counter-serviceable, ceremonial, or invidious as advancing social and technological complexities render them obsolete.

This tendency for instrumental habits to become ceremonial in character is true in terms of both collective action and individual conduct, and the matter resolves again to the nature of habit: while providing for a continuity of conduct in the individual, as well as the continuity of positions, concerns, and the community, habits also create the potential for rigid adherence to the past. In terms of individual conduct, this appears as absentminded routine (cf. Dewey, 1922, pp. 173-174), in alienation or a separation of means and ends; in terms of collective action, this rigidity appears in increasingly obstinate form as ceremonial adequacy and vested interest (see, e.g., Bush, 1983; Veblen, 1919, p. 100). In an ever-changing world, any habit is likely to become stale, maladaptive over time. The problem becomes, then, not just adaptation of institutions—a lack of obstruction and conflict in individual conduct and collective action—but adaptability, the maintenance of a flexibility of institutions in handling unforeseen problems.

This is true, again, on both the individual and social levels which habits join. Individual well-being and development is, by definition, a matter of both continuity and quality of conduct in the present and an unfolding of activity into the future. The terms well-being and development have been used here to denote those habits that are instrumental in terms of the adaptation and adaptability—viz., the quality and continuity—of individual conduct. The continuity of institutions, likewise, requires sufficient resolution of present conflicts to allow on-going cooperative behavior; but it also requires flexibility in adapting to changing circumstances. In the more concrete form of a going concern, this is the capacity to adjudicate conflict between,

e.g., positions within the concern in furtherance of the concern's 'public purpose'; but it is also the capacity to adjust the public purpose itself in light of future contingencies. Figure 1 may be taken as a useful diagram representing these considerations.

Finally, there remains a potential for the instrumental in individual conduct to be ceremonial in terms of collective action and *vice versa*. Specifically, there is the potential for conflict between the deliberative process by which habits are shaped and the judicial process by which the public purpose is formulated. This is depicted along the horizontal axis in Figure 1. This conflict between the interests of the individual and of the concern, and ultimately the community at large, has been described elsewhere as an enduring tension. Fortunately, the means of resolving any such conflict is present in the explication of the problem, and it is, in many essential respects, the deliberative democratic framework which Dewey proposed.

Without a thoroughgoing discussion,[17] it is enough here to say that Dewey's proposed principle of social organization is an educative, deliberative, and participative democracy. The emphasis in this regard falls on continual change at the direction of "associated individuals in which each by intercourse with others somehow makes the life of each more distinctive," (Dewey, 2006 [1919], p. 377). Elsewhere (Dewey, 1920, pp. 207-209), it was argued that the stability of the community at large, as well as its ability to evolve, are coextensive with the liberty of each individual to participate in current processes of collective action and their future direction.[18]

[17] See Tilman (1987).

[18] It is worth comparing these basic tenets to Veblen's 'Industrial Republic' (Tilman, 1996, p. 13) and West's 'Human Liberation' (1982) though this will not be taken up here.

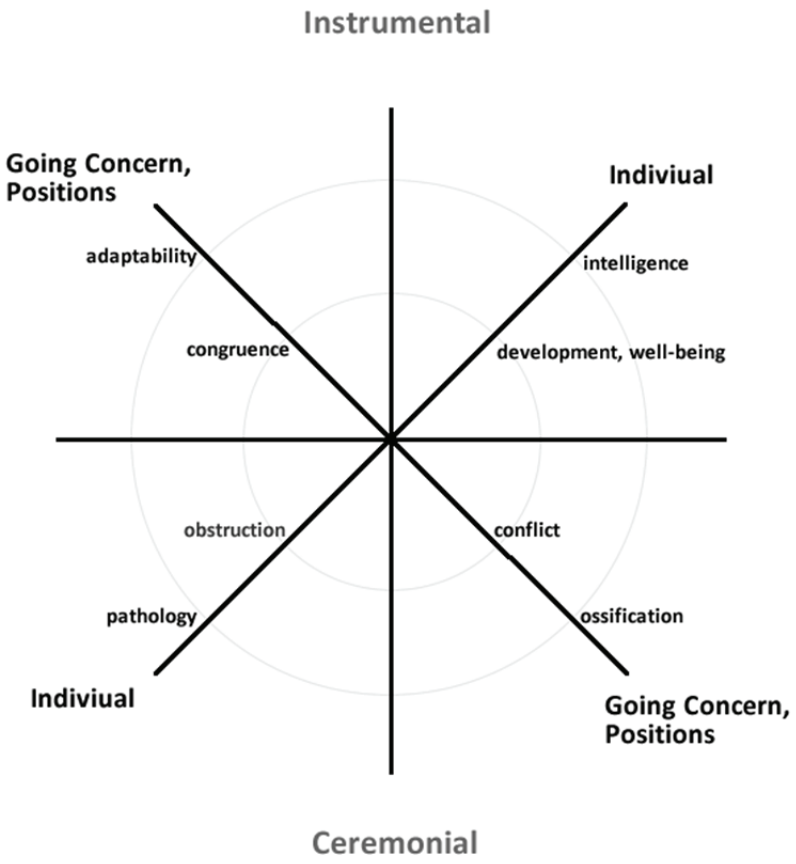

Figure 1 – The Veblenian Dichotomy

The Veblenian dichotomy is depicted in terms of both individual and social dimensions. The vertical axis shows a gradient from thoroughly instrumental institutions to thoroughly ceremonial, with the individual and social dimensions shown 'off-axis' to indicate potential combinations of ceremonial and instrumental attributes between the two. The topmost part can be taken as Dewey's participatory democracy. To move counter clockwise from there, then, is to move toward institutions in which the public purposes of going concerns are not adapted or adaptable to the needs of their constituents. Moving clockwise from the top, in contrast, is to move toward institutions unable to adjudicate conflict between individuals or positions within the concerns. In the extreme, at the bottom of the diagram, organizations break down altogether, failing to promote either expansion of individual experience or association between individuals (see Dewey, 1920 esp. p. 119).

Participatory democracy fits nicely with Commons' going concern and the relationship between its public purpose and its members:

> the will of the going concern is the composite will of all to the extent that each has any discretion in his acts…even the least of the manual workers…must be depended on for some discretion…dealing with the forces of nature, where his will modifies slightly the total result…. The collective will is the organized symposium of all the discretionary acts of all participants as they go along from day to day, according to the rules of the organization. (Commons, 1968 [1924], pp. 146-147)

This system of individuals, acting with degrees of discretion within the context of inherited working rules to constitute the purposes of the concern, suggests that conflict between the continuity and quality of individual conduct and the continuity and congruence of public purposes falls ultimately on (1) the participation of the individuals in shaping the purposes of the concern, amounting just the same to (2) the contributions of its members that the concern may enjoy in present functioning and future development.

Thus, where there is a potential conflict between the instrumental for the going concern and the ceremonial for the individual, there remains a possibility of resolution through the participation of individuals in the direction of the concerns of which they are a part. Conversely, there is an ever-present danger of invidious hierarchy and rigid working rules which not only diminish the well-being and development of some or all individuals involved, but also jeopardize the continuity of the concern itself by way of depriving it of the "full contribution of all its members," (Dewey, 1920, p. 208), stalling experimentation with new purposes and working rules, and fostering conflict rather than cooperation among its members.

To recapitulate, the Veblenian dichotomy is an analytical tool in which social processes are characterized as instrumental and ceremonial by their effects on individuals and the community at large. In this respect, the governing principle in relation to the individual is the effect on the continuity and quality of conduct. Human experience is a continuous process of acting—knowing, doing, and valuing—in which problems are inevitably met with and habits generated and reformulated in response. Overcoming impediments to action, however, must also

account for the consequences to well-being and development, the criteria and implications of which are products of the past and influences on the future. For the going concern, and in particular the community itself, the principal matter falls on its continuity and congruence. Both denote the manner in which collective action both controls and expands individual action through cooperation and stability of expectations.

Tool's instrumental value principle is a succinct statement of the dichotomy as exposited above: "do or choose that which provides for 'the continuity of human life and the noninvidious recreation of community through the instrumental use of knowledge'," (Tool, 1993, p. 121 and discussion in that chapter). This principle provides for continuity for both individuals and communities as well as their harmonious interaction in non-invidious recreation.

Conclusion

The foregoing constitutes a theoretical foundation based on the Veblen-Commons-Dewey tradition as considered relevant to the going concern model of the business enterprise. It has been shown that the framework begins with a social conception of the institutional milieu which both prescribes and proscribes the behavior of individuals while also facilitating the power of this behavior and the potential for its expansion. Following Commons, this social fabric is structured in terms of custom, going concerns, and positions within these concerns which give human agency the power to realize ends-in-view and to alter the future composition of the social fabric. Because habits both comprise institutions and direct individual conduct they constitute the key analytical notion connecting matters individual and social. This allows the arguments of Dewey and the social psychological analyses of basic psychological needs to enter the inquiry.

Particular to this dissertation's contribution to a heterodox theory of the business enterprise, the present chapter situates the model within a framework in which ways of knowing,

doing, and valuing take precedence over the material artifacts which are necessarily derived from the social fabric. Within this framework, the going concern model will be developed to show the business enterprise in terms of a complex institutional evolution rather than the result of a process of efficiently allocating given (and scarce) resources.

The framework so constructed in terms of going concerns and individuals, wed by the habits that mutually constitute their behavior, resolves evaluation of those habits to questions of the continuity and congruence of collective action—especially going concerns—and the continuity and quality of individual conduct. The Veblenian dichotomy, formulated in these terms, thus allows for the identification of social processes that facilitate cooperation, stable expectations, scientific inquiry, reasonable and non-invidious solutions to conflict as well as processes that are unnecessarily wastefully, fantastically obstinate, invidious, injurious, and pathological.

Finally, the matters of continuity and quality in one's own conduct and the continuity and congruence of the community's going concerns resolve to the nature of individuals' potentials and the interests of the community at large. This is to say that purposes of intermediary institutions—particular employments, going concerns, and the like—bear ultimately on the extent to which society as a whole can (1) realize and expand the efficacy of its stock of knowledge of ways and means and, which is to say the same thing, (2) facilitate the development of the capacities of its members and their contributions to society. As discussed, Dewey suggested that these comprised the essential features of his view of democracy.

These basic concepts and analytical devices have been developed presently in order to provide a foundation for the going concern model to be laid out in the next two chapters. As discussed in the previous chapter, this model has been developed from the insights gleaned from

a wide selection of literature drawn principally from heterodox economists and related scholarship, as well as from the history of the US computer industry. The framework proposed in the present chapter suggests that the sum of this work aims at some insight into how the institutions of modern capitalist communities developed, and the impact on these communities as well as their constituents. By defining the concept of an organization as a going concern within the broader society as itself a going concern, the framework emphasizes the essentially political nature of the subject. It furthermore allows for the exploration of the potential ceremonial characteristics of the business enterprise in its relation to the community at large. Both of these, the political and potentially ceremonial nature of the modern business enterprise, will be important features of the going concern model.

CHAPTER 3

THE GOING CONCERN MODEL OF THE BUSINESS ENTERPRISE, I

The body of scholarship from which the present work draws, both in economics and in the social sciences and philosophy, evinces a long and rich history of theoretical insights into the topics contemporarily categorized under the theory of the firm in economics. Yet, much of this work has not been formulated in terms of that field of research and, as such, has not explicitly offered an alternative theory to those in mainstream economics and the management literature. In some ways the heart of the present work, this chapter and the next will expound a heterodox theory of the firm, drawing from over a century of literature in political economy, sociology, and elsewhere. The result, termed here the going concern model (GCM) of the modern business enterprise, will provide a lens by which to view historical developments in the United States computer industry in subsequent chapters.

The GCM is built from the essential concepts described in the previous chapter. It focuses on the composition and augmentation of the joint stock of community knowledge; it conceptualizes the modern business enterprise as a going concern comprised of a hierarchy of interests which typically constitute going concerns in their own right; and it emphasizes the ceremonial character of these institutional arrangements. The model is laid out below in stages organized according to the degree by which consumptive activities and the interests of consumers are separated from productive activities and the interests of the business enterprise. This gives three 'degrees of separation' which each constitute identifiable ceremonial characteristics of the nature of the modern business enterprise.

The present chapter develops the three degrees of separation of consumption and production. These involve the direct interactions of business institutions and the joint stock of knowledge as discussed in the previous chapter, as well as the 'pure business' concern of the third degree of separation. Chapter four then brings the pieces of the GCM together, discusses the nature of firm boundaries, draws further connections to relevant literature, and presents the model as a lens with which to view relatively recent developments in the organization of firms and industries.

Before beginning, a few general comments are worth making in order to frame the body of these chapters. The model begins with an idealized 'handicraft' system in which the means-ends continuum of production and consumption constitutes an uninterrupted process of collective action in utilizing and further augmenting the joint stock of knowledge. It proceeds from there to an organization of economic activity in which some positions are excluded from participating in directing the way such activity is itself organized. Building on this, the motives of business in selling products, capitalizing on the earning capacity derived therefrom, and ultimately selling that capitalized earning capacity are integrated into the model. At each stage of this process the central focus is on the manner in which production and consumption become separated, distorting the initial means-ends continuum in which the two are not separated.

The result of this multifaceted separation of interests is the essential hierarchy of concerns, or power relationships, that defines contemporary capitalist firms. By implication, the business enterprise is found to comprise a number of enduring tensions, indicating a lack of congruence in the collective action which these organizations pursue, a potential threat to the continuity of the organizations themselves as well as the broader community, and a diminished quality of conduct for the individuals that fill the positions within the business enterprise. All of

this is to indicate, again, that the model developed herein explicitly seeks to understand the potential ceremonial characteristics of the firm. As argued in chapter one, this aspect has traditionally been neglected in extant theories of the firm.

The Differentiation of Employments and the Joint Stock of Knowledge

The foundation for the model is drawn from the idealized handicraft system as discussed by Veblen and C. Wright Mills, among others. The central characteristic of this system is found in the autonomy or discretion retained by those engaged in maintaining and growing the joint stock of knowledge. Mills' model of craftsmanship describes the central characteristics of work in this system:

> There is no ulterior motive in work other than the product being made and the processes of its creation. The details of daily work are meaningful because they are not detached in the worker's mind from the product of the work. The worker is free to control his own working action. The craftsman is thus able to learn from his work; and to use and develop his capacities and skills in its prosecution. (Mills, 1951, p. 220)

In this manner, the industrial system that is derived from the community's joint stock of knowledge is maintained and augmented such that the means and ends of labor form a continuous process in line with the continuity and quality of those engaged in the work. Dewey, likewise, saw this as the nature of the work of the skilled artisan who,

> is aware that what he is making is made for future use…[but] morally, psychologically, the sense of the utility of the article produced is a factor in the present significance of action due to the present utilization of abilities, giving play to taste and skill, accomplishing something now. (Dewey, 1922, p. 271)

Dewey continued, "The moment production is severed from immediate satisfaction, it becomes 'labor,' drudgery, a task reluctantly performed," (1922, p. 271). The separation of irksome production from gratifying consumption which characterizes the dominant views within economics is antithetical to this system (Veblen, 1898a). Instead, the industrial activities that

comprise the social provisioning process form an uninterrupted process whereby the values of the community are in line with the quality of the work to be done as well as the congruence of the community itself. In this system workers are able to learn from the experience of work. Thus, beyond simply possessing and using the joint stock of knowledge through the application of their skills, craftsmen are capable of augmenting it through technological innovation.

It is worth noting again that this is an idealized depiction of economic activity. As Mills himself indicated these features of the handicraft system are not intended to suggest that work has ever held all these meanings. Neither is it clear how much this actually reflects medieval craftsmanship. Experience suggests, however, that Mills was correct in observing that modern work has almost none of these meanings; and the going concern model of the modern business enterprise seeks, in part, to explain why and how this is the case. Toward that end, then, this is taken as the analytical starting point for the model.

Mechanization and the First Degree of Separation

Even if done for purposes of industrial efficiency the differentiation of employments creates a potential for certain relationships to dominate the direction of the further growth of the joint stock of knowledge. This is evident in the separation of consumption and production which, Sturgeon (1992, p. 362) has argued "is one of the most significant errors of the modern era." This separation, it will be shown, reflects an economic system organized according to the interests of one party to an industrial process over another as evidenced by the interaction of producing and consuming positions.

The situation gives a basic taxonomy of employments, which involve, to greater and lesser degrees, the use and maintenance of the joint stock of knowledge as well as the direction of its future growth. These employments fall on the industrial side of Veblen's distinction

between industrial and pecuniary employments (1901), and they include: (1) machine tending, denoting those activities which are requisite to running the industrial equipment, broadly conceived, but not the direction of the future changes in the industrial processes; (2) engineering, denoting the tasks involved in maintaining the wider industrial system and in directing its evolution through technological change. This distinction is taken most directly from Hobson (1906, pp. 67-70) in connection with the social implications of the machine, to be discussed shortly. A third category can be added to the taxonomy by reference to the user, which denotes an industrial employment on the receiving (or downstream) end of a given industrial relationship. The user resembles an engineer in sharing in access to the joint stock of knowledge and in the direction of its change; however, this discretion is limited in scope in that it is chiefly exercised through purchasing decisions from delivering (upstream) concerns.

With this taxonomy in mind, the industrial system is conceptualized as a network of occupations serving as engineers on one side of the flow of processes and users on the other, with the machine tending occupations attached to the network in terms of effort, but not discretion. Hence, the relationship between engineer and user is most closely aligned with Commons' (1961 [1934]) bargaining transaction, while those between the engineer and machine-tender are chiefly managerial in character. The relationship between these three employments in any given industrial process will be called a *going plant*. The term reflects the industrial or technological processes associated with the producer and consumer in tandem, in their present activities of both maintaining and augmenting the organization and its constituent occupations. The going plant is thus a going concern comprised of positions of users, engineers, and tenders. The engineer-user relationship directs the development of the joint stock of knowledge at the expense of those who are excluded from this direction but are still necessary for the going plant

to operate. The interests of the consumer in the activities of the producer thereby structure the joint stock of knowledge *qua* industrial arts to facilitate the activities of the former. As such, the generic interest of the going plant may be ascribed to technological proficiency, with the acknowledgment that this is not wholly instrumental to the extent that it comes at the expense of the tender's well-being and participation in the concern.

However, the going plant as organized under a capitalist regime requires profitable money transactions sufficient to ensure the ongoing relationships between positions therein.[1] These are typically accounted for as income on the engineer's side of the concern and outgo on the user's side. The import of this stricture is in its bearing on the nature of user discretion. Because the going plant's survival requires these ongoing money transactions, the user's interest can only be served in so far as it does not jeopardize these transactions. Generally, this enforces a relegation of the user's actual discretion to that which can be effected through purchasing decisions. The degree to which this amounts to a loss of discretion will depend on specific circumstances and may be fruitfully conceived in terms of Commons' bargaining transactions (see Commons, 1961 [1934]). The matter, likewise, suggests the importance of intra-organizational power struggles as analyzed in economic sociology. Here again the overarching concept is the organization of industrial processes through going concerns: "The basic problem for organizational actors is to create a stable world so the organization will continue to exist," (Fligstein & Brantley, 1992, p. 286).

Mechanization

The processes at issue here can be illustrated with the mechanization of production which marked the transition from what Veblen called the handicraft era to the machine era. In this

[1] Cf. Veblen: "...except so far as it is managed with a constant view to profitable bargains, the production of goods is not a business proposition," (1921, p. 109).

transition the machine supplanted the handicraftsman and the joint stock of knowledge came to be located not in the skills of people but in the structure of machines. The result was a new relationship of producing employments to the joint stock of knowledge: The engineer and the tender superseded the handicraftsman in the responsibility for maintaining the joint stock of knowledge through the provisioning of the material means of production. However, while the engineer under these new circumstances retains a degree of autonomy in directing the industrial system, the machine tender does not. Having effectively lost his skills to the design of the machine, the tender has become a residual to the machine process, as argued famously by Marx and Engels (1848):

> Owing to the extensive use of machinery, and to the division of labour, the work of the proletarians has lost all individual character, and, consequently, all charm for the workman. He becomes an appendage of the machine, and it is only the most simple, most monotonous, and most easily acquired knack, that is required of him.

Stated differently, the knowledge which the worker once retained, that portion of the joint stock of knowledge once held as skill, is transferred to the machine. "[M]ore and more of the thought and will of the inventor, less and less of that of the immediate human agent or machine-tender is expressed in the product," (Hobson, 1906, pp. 70-71). The activities of the machine tender are no longer intimately tied to the maintenance of the joint stock of knowledge. With the transfer of knowledge go also the values relevant to production, away from the worker and toward the interests for which the machine is designed. Thus with the material benefit of the user attends a degree of autonomy or discretion lost by the machine tender. The term 'alienation' is indicated in this regard, a term which Mills, among others, embraced:

> Alienation means boredom and the frustration of potentially creative effort, of the productive sides of personality. It means that while men must seek all values that matter to them outside of work, they must be serious during work: they may not laugh or sing or even talk, they must follow the rules and not violate the fetish of 'the enterprise.' (1951, p. 236)

In other words, the public purpose of the going plant becomes disjointed from the interests of the tenders – the values that prescribe their behavior are not their own.

The introduction of the machine thus marks an integral point at which the activity of the machine tender both in current quality of conduct as well as in the further development of his capacities is diminished. Regarding this latter point, it is worth considering Hobson's strictures on the educative influence of the machine:

> Machinery, like everything else, can only teach what it practises. Order, exactitude, persistence, conformity to unbending law – these are the lessons which must emanate from the machine.… The law of machinery is a law of statical order, that everything conforms to a pattern, that present actions precisely resemble past and future actions. Now the law of human life is dynamic, requiring order not as valuable in itself, but as the condition of progress. The law of human life is that no experience, no thought or feeling is an exact copy of any other. Therefore, if you confine a man to expending his energy in trying to conform exactly to the movements of a machine, you teach him to abrogate the very principle of life. (1906, p. 348)

Although Veblen (1904, pp. 308-309) had argued that the machine promotes an intelligence in terms of mechanical cause and effect in the habits of the machine tender, Hobson, addressing Veblen, found this to be insufficient recompense to those whose relation to the machine involved no human discretion:

> The net influence of machinery upon the quality of labour, then, is found to differ widely according to the relation which subsists between the worker and the machine. Its educative influence, intellectual and moral, upon those concerned with the invention, management, and direction of machine industry, and upon all whose work is about machinery, but who are not detailed machine-tenders, is of a distinctly elevating character. Its effect, however, upon machine-tenders in cases where, by the duration of the working day or the intensity of the physical effort, it exhausts the productive energy of the worker, is to depress vitality and lower him in the scale of humanity... This human injury is not adequately compensated by the education in routine and regularity which it confers, or by the slight understanding of the large co-operative purposes and methods of machine industry which his position enables him to acquire. (Hobson, 1906, p. 351)

Here Hobson indicates the social nature of the matter at hand: it is not the machine itself which is detrimental to its tender, but the relationships of the going plant. The physical machine is merely an artifact of the social fabric so constructed. In this light, it is necessary to discuss the institutions of property, an important component of the organization under consideration.

Property Institutions in the First Degree

In the first degree of the separation of production and consumption the analysis has not yet necessarily moved out of that "precapitalist business situation," which was "managed with a view to earning a livelihood rather than with a view to profits on investment," (Veblen, 1904, pp. 23–4). Thus, the engineer of the taxonomy laid out above may be treated also as the proprietor. The institutions of property, however, do take on a special significance at this stage of the exposition of the model, which will be important also for subsequent sections.

As discussed in Veblen (e.g. 1914), relatively early notions of property developed in the context of the guild system and were worked out chiefly for the purposes of securing a livelihood for those responsible for maintaining the community's industrial arts – that is, for maintaining and stabilizing their access to the social provisioning process. "The ancient craft gilds," according to Commons (1919, pp. 15-16), were "rightly known as 'mysteries.' The member of the gild learned through his apprenticeship a skill in manufacture unknown and unpractised by outsiders. This mystery was his vested right—his property against all the world." The transfer of knowledge and values illustrated above by the introduction of the machine, however, meant also the transfer of that 'property' from the skilled artisan to "his employer who owned the machine," (1919, p. 16; also Fisk, 2009, p. 27).

In this manner, once the industrial arts come to require the creation and use of extensive machinery, the institution of corporeal property – ownership over tangible things – becomes

relevant to the organization of the going plant (Gagnon, 2007; Veblen, 1908). The going plant *qua* business enterprise comes one step closer to the modern business enterprise in that it now involves an *investment* in a *tangible asset* for the purposes of production. That is, the firm, still in inchoate form analytically here, must now purchase and hold a portion of the joint stock of knowledge reflected in the material means of production. Property is thus the defining institution of a firm's participation in the industrial system, a reflection of the engineer-user relationship in its management of the joint stock of knowledge; and investment in this property ties the firm to the plant as a going concern, encapsulating the going plant in the methods and motives of business.

Historically, this is part and parcel to the alienation of the machine tender, as the increasing importance of the material means of production relative to labor made it impossible for every craftsman to produce efficiently on his own. As Hobson argued, the relatively simple and low-throughput nature of the industrial arts in the handicraft era meant that an individual artisan could own the fixed and circulating capital necessary for his trade. The separation of those employments directing the activities of the industrial system from those tending the machines, then, is the result of "those improvements in mechanical arts which, by continually increasing the proportion of capital to labour in a business, placed capital more and more beyond the possession of those who supplied the labour power required to co-operate in production," (Hobson, 1906, p. 69; see also Veblen, 1914, p. 287).

This is not to suggest that the institutional evolution that characterized the movement toward the factory system, the division of labor, and the machine was the natural result of a society's trend toward ever-increasing technological progress. Marglin (1996), in fact, argues that these changes to the organization of production and consumption were less a result of the

technological movement toward more costly means of production as they were the result of the exercise of power by capitalists over workers. The loss of discretion by the machine tender preceded the introduction of expensive machinery, and reflected the efforts of a dominant class to maintain claims of legitimacy in the industrial process. Toward these ends, the division of labor divorced the worker from his control over the product, and the factory and patent systems divorced him from control over the productive process. Thus, Marglin (1996, p. 23) concludes, "contrary to neoclassical logic...innovation depends as much on economic and social institutions—on who is in control of production and under what constraints control is exercised," as on technological superiority.

Marglin's conjecture rightly focuses the discourse in technological change on the power relationships that determine whose interest new technologies would serve: here, the going plant. The going plant in the present model is defined in terms of the social relationships which afford money transactions to take place between parties in the use of technological processes, i.e. some portion of the joint stock of knowledge. In the abstract, these relationships are given in the going concern model as between engineers and users (chiefly, bargaining transactions) and engineers, acting as foremen and proprietors, and machine-tenders (chiefly, managerial transactions). Figure 2 illustrates these relationships as well as that of the going plant to the joint stock of knowledge. The organization of the going plant, then, is potentially ceremonial as a result of the lost discretion among both the machine-tenders and the users, on comparison to an artisanal, or handicraft, case in which the means and ends of production and consumption have not been divorced. By "apportion[ing] the burdens and benefits of wealth creation," (Commons 1961 [1934], p. 68), defining the working rules by which the joint stock of knowledge is augmented,

directed, and encapsulated, the community engages in rationing transactions with the going plant vis-à-vis the joint stock of knowledge, as indicated also in Figure 2.

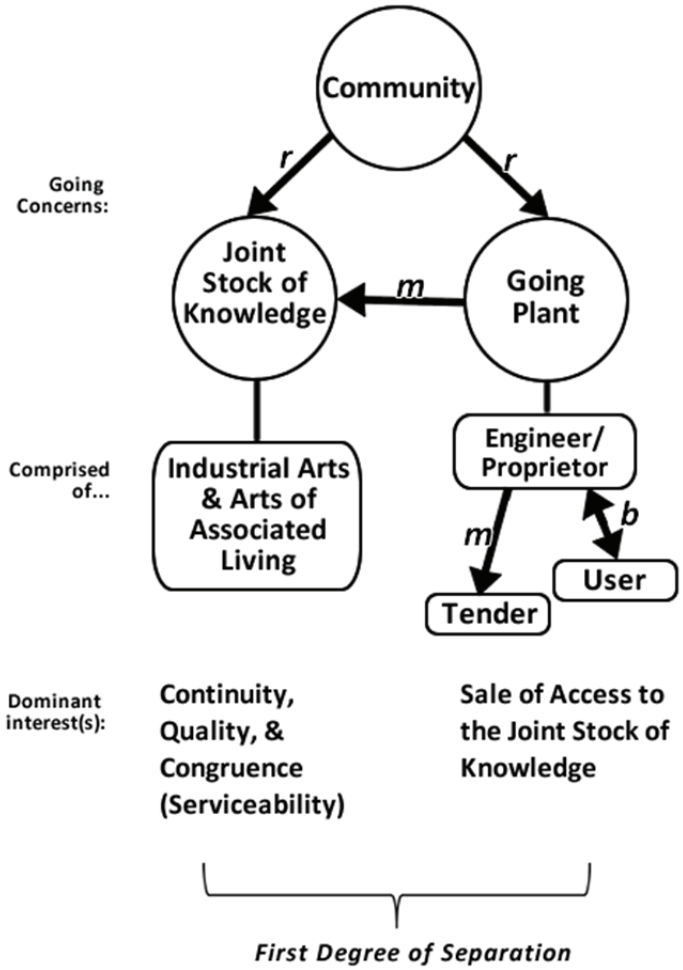

Figure 2 – The First Degree of Separation[2]

The first of three components of the going concern model is illustrated. Circles denote going concerns and beveled rectangles represent positions therein. Arrows indicate transactions according to Commons' taxonomy. Hence, arrows marked 'r' indicate that the primary form of transaction will be rationing, as e.g. between the community (as superior) and the going plant (as inferior). Managerial transactions are likewise marked with an 'm', and bargaining transactions between legally contemplated equals are marked with a 'b' and given bi-directional arrows.

[2] This as well Figures 3 and 4 are derived from a diagram developed by James Sturgeon as part of a workgroup on evolutionary social theory at UMKC, 2008-2010.

It is worth noting here Galbraith's (1967) analysis of technological change and the labor unions. There as well it is recognized that technological change, though it may bear some benefit to society, is directed by the business enterprise toward "minimiz[ing] the number of contingencies beyond its control," (p. 267) with the supply cost of labor and the potential for a strike being an important issue in this regard. The result was a gradual diminution of the numbers of the manual laborers, and a rise of the technostructure in which the "[d]istinction between those who make decisions and those who carry them out, and between employer and employee, are obscured," (p. 268). Here, in the Twentieth Century, as prior with mechanization, the going plant – so far as it was to remain a going concern – was actively maintained so as to foster stable technical relationships within. And the interests of the user in technical proficiency of the plant, or of the machine-tenders in stable, quality work are of secondary or tertiary concern.

The Going Business and the Second Degree of Separation

Once the activities of business transactions become a separate employment from oversight of the industrial relationships of the engineer and the user, the interests of business come, to a lesser or greater degree, to dominate those industrial relationships. Property effectively defines the purview of the business occupations, and so long as the institutions of property continue to be those by which the structure and traffic of the industrial system are managed the business occupations will be favored in the business enterprise. This is to say that the values of the business occupations come to dominate the public purpose of the firm as a going concern, while the knowledge and values involved in the industrial arts are maintained by a separate class of occupations located in the going plant (Veblen, 1901; 1914, pp. 216–9).

This separation of ways of knowing, doing, and valuing creates a distinct organization, the going business, within the business enterprise. The going business interest engrosses some portion of the going plant relationships and defines boundaries of the firm in terms of the internal versus external interests in access to the joint stock of knowledge, or industrial arts. That is, whereas positions within the going plant in the first degree were divided in terms of the interests to which the industrial arts were directed, in the second degree positions are defined in terms of access to, or the usufruct of, the industrial arts so defined.

Business interest, by definition, is in the accumulation of property, of assets or capital, and success in business is measured by the capitalized pecuniary value of those assets. The nature of the institutions of property as they concern business assets is as follows. The function of property is to allow business to invest in and divest of material objects and social relationships, realizing pecuniary values at the points of purchase and sale. In the interim between purchase or creation and sale, property allows business to 'hold' an asset for purposes of generating a flow of earnings (Gagnon, 2007, p. 595; Veblen, 1908, p. 539). Property thus provides the means by which the boundaries of the business enterprise are defined vis-à-vis the industrial system more generally, in addition to generating the earnings on which the continuity of the firm as a going concern depends. This much was the case in the business direction of the going plant described in the previous section.

As both Veblen and Commons recognized, property is fundamentally a right to exclude others from what they want but do not have. The value of property thus reflects the price the business is able to command on threat of withholding access to the use of the property. In the institutional economics literature these positions of power are called *differential advantages*. In the present analysis that power to command a price is in the first place a reflection of the power

to deny access to the usufruct of the joint stock of knowledge. When this power is tied to the going plant through the material means of production, it can be called a tangible asset, following Veblen: "such assets as represent the earning-capacity of any mechanically productive property," (Veblen, 1919, p. 69). Though Veblen spoke specifically to the material means of production, e.g. physical plant and equipment, the concept is expanded in the current analysis to all business assets which are most appropriately considered within the relationships of the going plant. Thus, insofar as skilled employees confer earning capacity to the firm by way of discrete control over a portion of the joint stock of knowledge, the employment of these workers would fall under this heading as well (though Commons would classify these contractual relationships under 'incorporeal property').

Whereas under the first degree of separation the organizing concern was in the maintenance and growth of the joint stock of knowledge, under the second degree of separation the organizing interest is in the maintenance and growth of profitable transactions in its own right, as realized, or measured, in monetary values. In this manner, the overriding purpose of the firm becomes survival and growth *as a business* and concern for the technological proficiency of the plant or the quality of work therein becomes further removed (cf. Galbraith, 1967). The firm so organized will herein be referred to as a going enterprise, consisting of a going plant and a going business, as well as the relationships that organize their interaction. Though a proper review of the history is beyond the scope of the present project, it should be noted that the development of the modern going enterprise described above involved substantial innovations in accounting procedures. These included the development of cost accounting which allowed the enterprise to assess and ultimately govern the going plant and going business (Chandler, 2002),

as well as asset accounting and depreciation which allowed for the maintenance of the firm as a going concern on financial terms (Brief, 1966; Bryer, 1993; McWatters, 1993).

Profitable transactions are created through the differential advantage of the industrial processes engrossed by the going business vis-à-vis the following: (1) purchasing concerns, to be considered here as coterminous with users in the going plant relationships; (2) selling concerns, of which the business' own industrial positions are users; and (3) concerns indirectly associated with the business through other concerns – e.g. competitors, actual or potential (see Commons, 1961 [1934], p. 816; Veblen, 1904, pp. 54-55). These differential advantages require that the firm holds some portion of the joint stock of knowledge to which others are willing to pay for access, which is merely to say that the firm requires a going plant in order to exist. The business enterprise thus acts as a warden of knowledge, of the industrial arts, and the boundaries delineating its jurisdiction are drawn with property and contract in order to generate favorable pecuniary transactions. The means of accomplishing this involve two related processes, the first regarding the relationship of the firm itself to the joint stock of knowledge, the second to the way external interests relate to the joint stock of knowledge.

First, the firm must develop *internal capabilities* – i.e. competencies in the relevant joint stock of knowledge. This is done through purchase or production of the means of production and through employment of those with the skills necessary for the operation and management of the means of production. The firm can achieve this by a) employing engineers with knowledge of efficiently satisfying user needs – or more accurately, engineers which users believe to be capable of satisfying their needs, b) purchasing or otherwise holding claim on tangible and intangible property which is necessary to efficiently satisfying user needs, and c) employing any additional workers necessary to the efficient use of the productive assets of the firm. It should be

clear that these requirements are the investment in the going plant discussed in the previous section. Profitable transactions can be generated directly through licensing access to controlled knowledge, or indirectly by sale of the product of the controlled knowledge.

Second, the firm can generate profitable transactions through manipulation of the knowledge and values of external positions such as its users to give value to – or generate demand for – the internal capabilities of the firm. The methods falling under this heading can be categorized in terms of the relationship of the external interest to the firm – i.e. seller, buyer, or competitor – and these relationships can be understood in terms of the degree of discretion the interested parties enjoy in their relationship with the business enterprise.

Of cardinal importance in this regard is the definition of the boundaries defining external versus internal interests, particularly between a firm and its customers. While these boundaries may seem obvious *ex post* – that is, in light of extant ownership boundaries between firms – it must be recognized that the going plant would, save for its direction toward business interests, be comprised of members of both the producers and the users of a technology interacting on a technical basis. A first step in reconciling business interests with the going plant necessarily involves aligning the positions within the going plant so that their interaction is at least in part executed through monetary exchange. Without this, there is no basis on which the going business can effect differential advantages. It would appear that this constitutes the first point at which the user loses discretion, with remaining discretion relegated to the ability to purchase what the enterprise has for sale. (The 'productization' of computer software will be given as an illustration of this point in chapter five.)

To the extent that the going business side of the firm dominates the going plant side, there exists a potential for the manipulation of the putative importance of firm's capabilities to

the buyer.[3] Such allows the firm to create or improve upon differential advantages vis-à-vis concerns which are external to it in terms of access to the relevant portion of the joint stock of knowledge. It is furthermore clear that to the extent the firm is successful in this regard the going business' interest in profitable transactions has come to override the interests of the going plant. That is, the interests of the user-engineer relationship which were served at the expense of the machine tender in the first degree of separation are themselves superseded by the interests of business in its own right, though the two are not necessarily incompatible.

Advertising evidences this divergence of interests. As Veblen observed (1904, pp. 55-57), the goal of advertising is to establish differential advantages through the "organized fabrication of popular conviction." While acknowledging that some portion of this practice may in fact be serviceable to the user in providing useful information, Veblen nonetheless discussed common instances in which the effect was decidedly not serviceable. Advertising often amounts to a "competitive disturbance of trade," aiming to "divert purchases, etc., from one channel to another channel of the same general class," (p. 57). In instances in which the competition is not between firm's producing the same type of output, there may yet be a similar wasteful competition in marketing attempts to expand the use of the firm's goods.

Galbraith described the nature of advertising similarly, but framed the discussion in terms of the requirements of the business enterprise as a going concern: the need to survive and grow, and to plan for these accordingly. Advertising constitutes a form of demand management which does not compel any individual, but creates a general compulsion in which no great part of the

[3] Likewise, the firm may manipulate the importance of the purchasing position of the firm to its suppliers – diminishing the importance of capabilities of suppliers. This is clearly just the reverse of the method already mentioned, so it will not delay the analysis here. It is enough to say that the strategic maneuvering of the firm vis-à-vis its buyers is likely to be met with similar behavior on the part of sellers.

masses will opt out and thereby threaten sales. Moreover, it maintains an ever-increasing demand for goods so that as the amount of goods on the whole increases people continue to demand ever more, thus allowing the firm to grow (Galbraith, 1967, pp. 208-209). Thus, while Veblen discussed the disturbing character of such maneuvering, from the firm's perspective stability on business terms may in fact be the more important matter at hand.

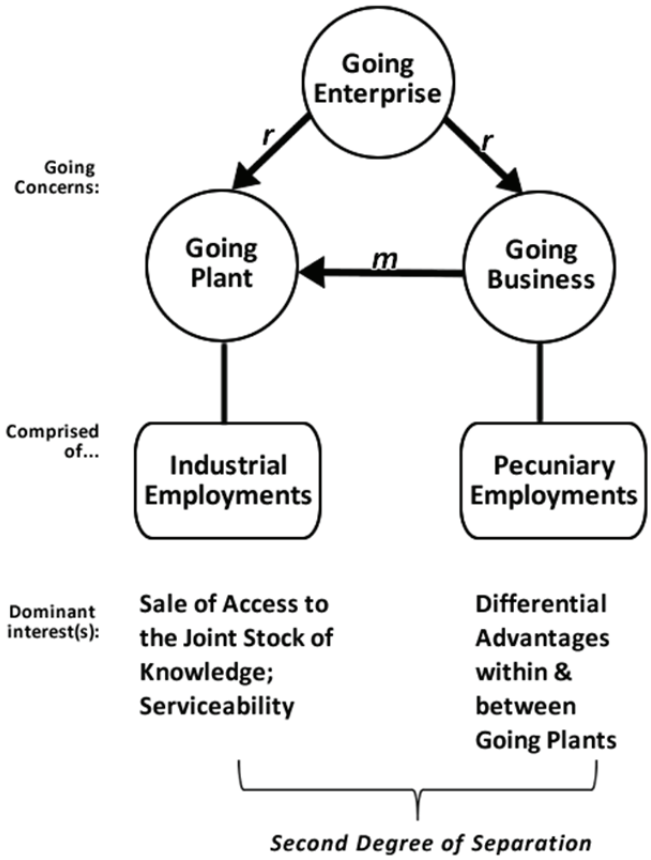

Figure 3 – The Second Degree of Separation

The second component of the going concern model is illustrated. As in figure 2 above, circles denote going concerns, beveled rectangles represent positions therein, and arrows indicate transactions according to Commons' taxonomy.

The essential argument on this heading is that the business enterprise as comprised of both going plant and going business relationships, and with the values of the latter dominating those of the former, is likely to be directed toward different ends than the interests of the going

plant. As Veblen observed, what advertising "aims at is the sale of the output, and it is for this purpose that it is useful. It gives vendibility, which is useful to the seller, but has no utility to the last buyer," (1904, p. 59). If the user retained some real participation under the first degree of separation, she loses it here as the transactions between user and the delivering firm become managerial in nature (see Figure 3 above). Likewise, the discretion of the going plant, taken as a whole, is relegated to the perceived impact its knowledge and values have on the going business' bottom line. The industrial processes of the going plant, considered as a part of a wider industrial system, are thus translated into pecuniary outcomes for the firm.

As described above, tangible assets constitute the means by which firms participate in the industrial system through property and contract. These tangible assets, which take the form of owned machines and employed skilled men and women, are thus a reflection of the engineer-user relationship and its superior position of discretion vis-à-vis the machine tender within the going plant. They are, likewise, a means by which to create a stream of profitable transactions for the firm. Tangible assets, however, are not the only means of creating, securing, and maintaining profitable transactions for the business enterprise. Once occupations of business come to be separate from those of engineering and labor, the firm can be expected to pursue earnings through any number of business expedients beyond merely meeting the demand of its customers. These extra-industrial expedients are here called differential advantages, and their significance for business success is in many instances to be counted as substantially greater than the firm's tangible assets (cf. King, 2006, p. 132).[4] When these differential advantages are secured and valued according to extant institutions of property they are, following Veblen, called

[4] Cf. Lev & Zarowin (1999) who argue that problems in the accounting for intangibles in financial reports have distorted the information these reports seek to provide.

intangible assets, representing "assured income which cannot be assigned to any specific material factor as its productive source." They represent,

> no contribution to the output of goods and services, but only an effectual claim to a share in the 'annual dividend,' on grounds which appear to be legally honest, but which can not be stated in terms of mechanical cause and effect, or of productive efficiency, or indeed in any terms that involve notions of physical dimensions or of mechanical action. (Veblen, 1919, pp. 69-70)

Intangible assets are to the firm in the second degree of separation what tangible assets are in the first degree: a means of organizing the interactions of the firm in relation to the joint stock of knowledge, of controlling 'access to the market'. In much the same vein, Hamilton (1943; cf. Rutherford, 2010) discussed 'market equities', "new-fangled rights which in essence are pecuniary," (p. 32) generally developed within the private sector and sanctioned after the fact by government. Whereas tangible assets are a reflection of the dominance of the engineer-user relationship in the going plant, intangible assets or market equities are a reflection of the dominance of the going business over the going plant. In the previous section, tangible assets were shown to be a means of organizing going plant relationships, allowing firms to invest in the industrial process; and competitive pressures, it was argued, reinforced the goals of technological proficiency over the quality of work among the machine-tender class. Analogously, intangible assets in the second degree allow firms to invest in an economic system which requires proficiency in industry as well as in business maneuvering. Intangible assets thus become a way of managing business relationships more generally; and once again it is expected that competitive pressures will reinforce the need among firms to use all expedients possible to secure differential advantages.

Intangible property extends[5] the institutions of property to include all ongoing relationships from which participants expect to earn an income (cf. Fligstein, 1996). It is thus a "going-concern value" reflecting the,

> joint willingness of all participants: the willingness of employees and managers to maintain and operate the plant; the willingness of customers to buy, of investors and bankers to lend, of material men to sell, and of others to participate. (Commons, 1961 [1934], p. 422; cf. Commons, 1968 [1924] esp. p. 181)

As all property institutions, intangible property is a business, as opposed to industrial, institution which is developed generally in conjunction with the state (Fligstein, 1996). For this reason the specifications of intangible property rights have been defined historically according to the interests of business and the state. In this light it is clear that the intra- and interorganizational governance structures broadly in question very often involve the specification of a framework of property rights (cf. Fligstein, 1996, 2001). A cursory look at this issue follows, to be explored through a particular industry in chapters five and six.

A wide variety of classes of intangible assets which are separately identifiable in business practice, and usually in accounting practice, exist. These include brand names, copyrights, corporate culture, covenants not to compete, franchises, future interests, licenses, operating rights, patents, record masters, secret processes, supplier relationships, trademarks, and trade names (Brand Finance, 2007; Hendriksen & van Breda, 1992, p. 633; King, 2006, p. 136). Each of these can be attributed to some portion of the 'joint willingness' of the parties involved to participate in the activities of the business enterprise. However, they vary in the degree of remoteness to industrial processes of the going plant. Patents, copyrights, and trade secrets, for

[5] This extension was effectuated in the United States most substantially in Adams Express Co. v. Ohio (1897). See Commons (1968 [1924], pp. 172-182) for further discussion.

instance, might be expected to be associated very closely with the joint stock of knowledge to which the firm sells access.

Relationships with suppliers and brand names, on the other hand, are more likely an issue of capitalizing favorable business relations and user perceptions which bear only an indirect connection to the joint stock of knowledge, removed one or more degrees by, for instance, the manipulations of advertising. Hence, as Hamilton argued,

> [t]he trade-mark came into being in order that defective goods might be traced to their makers; it is currently used to guard the entrance to the market. So long as there is money to pound into human heads that if it is not Bayer's, it is not aspirin, the name itself remains a market equity. (1943, p. 28)

Typically, however, the largest intangible asset on a firm's balance sheet is goodwill (Hendriksen & van Breda, 1992, p. 640). At base goodwill is simply an accounting method of measuring the value of a company at purchase less the fair market value of its identified tangible and intangible assets (King, 2006, pp. 35-36). However, this does not quite define the concept nor explain its source (Hendriksen & van Breda, 1992, pp. 632-633). Though approaches to goodwill are varied both in the economics literature as well as within accounting, it is enough here to say that goodwill is an intangible asset representing "advantages that are not specifically identifiable," (Hendriksen & van Breda, 1992, p. 637), often attributed to "advantageous business relationships, good relations with employees, and favorable attitudes of customers," (p. 640).

Commons (1968 [1924], p. 206) similarly attributed goodwill to "confidence in the commodities" being produced, thereby recognizing the enjoyment of a property right over the organization of business transactions generally – the very nature of intangible property. Thus, although encompassing more than favorable relations with customers, goodwill, in this regard at least, denotes ownership over the ongoing perception of the value of the access to the joint stock

of knowledge which the firm offers for sale. It is valuable to the firm because it "lifts the business somewhat above the daily menace of competition and enables it to thrive without cutting prices," (Commons, 1919, pp. 25-26). It is a reflection of differential advantages, "a competitive asset," which "diminishes in value with an increase in the supply of competing goodwills," (Commons, 1968 [1924], p. 206); it is, again, a value to the business in vendibility, of no particular use to the user.

To recapitulate, the second degree of separation between consumption and production involves two additions to the model of the business enterprise over the first degree: the going business and intangible property. The going business denotes a distinct interest separate from those found within the relationships of the going plant. The firm as such becomes a going enterprise whose public purpose reflects first and foremost the interests of business as a going concern. Hamilton (1943) may have referred to the same notion of the firm as the 'corporate estate', denoting the neo-feudal characteristics of a property system which affords control not only in productive assets but in market equities reflecting rights in access to the market. The knowledge and values associated with making profitable transactions grow beyond genuine service to the customer, creating the potential for conflicting values within the firm.

Intangible property in turn extends the institutions of property to encompass the relationships which are of chief importance to the going business, though they may be of no direct concern to the going plant. In this way, "not only are productive assets capitalized, but any institutional reality is capitalized as well, be it social, legal, political, cultural, psychological, religious, technical, or anything else that can grant an earning capacity," (Gagnon, 2007, pp. 596-597). Tangible and intangible assets, or capital, thus allow for the management of the industrial system to the benefit of firms in terms of favorable pecuniary transactions, with serviceable

industrial transactions amounting to a by-product of shrewd business; capital is, "in the words of Veblen, any capacity for vested interests to gain something for nothing," (Gagnon, 2007, p. 597). The boundaries of firms are in this way gerrymandered through the competitive maneuvering of the business occupations to create and sustain differential advantages, and it is unlikely that these boundaries would conform to any reasonable notion of industrial or organizational efficiency.

In the literature from which the present model is drawn, this idea is no clearer than in Veblen's discussion of consolidation. As he argued, efforts to consolidate ownership and control over business are generally,

> directed to making it difficult for the plants or processes in question to be carried on in severalty by their previous owners or managers. It is commonly a struggle between rival business men, and more often than not the outcome of the struggle depends on which side can inflict or endure the greater pecuniary damage. Any pecuniary damage in such a case not uncommonly involves a set-back to the industrial plants concerned and a derangement, more or less extensive, of the industrial system at large. (1904, p. 32)

Consolidation may just the same be justified on grounds of greater industrial efficiency, but it must be kept in mind that these conditions are created by the going plant, not the going business. In such cases of consolidation the "ulterior end sought" remains "an increase of ownership, not industrial serviceability," (p. 37). Consolidation that is advisable in terms of the interests of the user will be delayed until the business interests concerned can reach an agreement. The result is a "chronic derangement, duplication, and misdirected growth of the industrial equipment while the strategy is going forward, and expensive maladjustment to be overcome when the negotiations are brought to a close," (p. 39).

The Credit Economy and the Third Degree of Separation

The analysis given thus far has considered only those business activities that have some direct connection to the industrial arts. Under the first degree of separation the firm is guided by

the engineer-user relationship that dominates the going plant and technological proficiency, limited by the construction and maintenance of user-interactions through purchases, is the overriding public purpose of the firm. Under the second degree the going business comes to dominate the interests of the firm and differential advantages vis-à-vis users, suppliers, and competitors become the dominant aim of the firm. In both cases the firm operates through purchases and sales, that is, through the exchange of property rights.

Nothing, however, requires that the profitable exchange of property rights has any direct connection to productive activities. Indeed, once the institutions of property are expanded to cover intangible relationships it becomes possible, if not altogether inevitable, that business will be directed not toward investment in assets for the purposes of creating future sales of access to the joint stock of knowledge, but for the sale of these assets themselves. Business directed toward these ends then will be concerned primarily with the perceived values of property rights themselves and only secondarily, if at all, with the serviceability of industrial relations and the survival and growth of any particular firm (Veblen, 1901 esp. pp. 201-3 on the nature of speculators). In this manner, the interests of producers and consumers, or business and the community, become separated by yet another degree.

Veblen's analysis of equities markets illustrates:

> The capital market is the modem economic feature which makes and identifies the higher 'credit economy' as such. In this credit economy resort is habitually had to the market as a vent for accumulated money values and a source of supply of capital. (Veblen, 1904, p. 151)

This is to say that the intangible assets that developed to manage business traffic as described previously come to be themselves the subject of business maneuvering as a new class of business occupation develops with no ulterior purpose for holding property than the realization of a profit through the manipulation of its perceived value. Whereas businesses in the second degree are

defined in terms of the differential advantages deriving from control of the usufruct of the joint stock of knowledge, they are in the third degree defined in terms of the control of access to those differential advantages themselves, capitalized as intangible assets. The occupations concerned in this higher degree of business, the negotiators of capital (Veblen, 1904, pp. 151-152), engage in the purest form of business activity: exchanging property rights for the sole purpose of realizing pecuniary value in their exchange.

These property rights are the means by which firms participate in the economic system for the purposes of generating earnings. They are valued at base in terms of their expected earning capacity. "In the capital market the commodity in which trading is done, then, is the capitalized putative earning-capacity of the property covered by the securities bought and sold," (Veblen, 1904, p. 154). The putative nature of these asset valuations is key.

> [P]utative earning-capacity is the outcome of many surmises with respect to prospective earnings and the like; and these surmises will vary from one man to the next, since they proceed on an imperfect, largely conjectural, knowledge of present earning-capacity and on the still more imperfectly known future course of the goods market and of corporate policy. (Veblen, 1904, pp. 155-156)

Much as business efforts under the second degree can manipulate the serviceability of a firm's product as perceived by the user, it is typically the case that business can manipulate the perceived earning-capacity of property rights traded on the capital markets. The overriding goal becomes in this sense to,

> induce a discrepancy between the putative and the actual earning-capacity, by expedients well known and approved for the purpose. Partial information, as well as misinformation, sagaciously given out at a critical juncture, will go far toward producing a favorable temporary discrepancy of this kind. (Veblen, 1904, p. 156)

Differential advantage is, again, the means of effecting favorable business transactions. In the second degree of separation this could be accomplished through expectations of

serviceability of a firm's product or process. In the third degree, however, the advantages are to be had within the realm of the expectations of pecuniary value. So far as they are won by firms, these differential advantages are realized or capitalized in the same manner as in the second degree of separation, through the intangibles held by the firm. Historically, the dominance of this form of business might be traced to the late nineteenth-early twentieth centuries as the United States transitioned to the 'credit economy,' or what Commons (1961 [1934]) called 'Banker Capitalism'. These terms refer to the integral role of the extension of commercial credit in the modern economy which, as described in Veblen (1904, pp. 112-114), tends to create "a redistribution of the ownership of property whereby the creditor class, including holders and claimants of funds, benefits" at the expense of those holding assets more directly associated with the joint stock of knowledge – e.g. owners of industrial plant and equipment.

In the way of more contemporary developments, Lazonick (2012) has illuminated the trend among large US corporations in inflating their own stock prices through stock buybacks. Beginning in the 1980s this trend appears to have been spurred by business norms emphasizing maximum value to the shareholders above all else and the use of stock options in top management compensation packages. Lazonick's analysis of this trend is relevant to the present model on a number of accounts. First, it is clear that the behavior in question does not even bear the indirect value to the community that comes with vendibility in the second degree:

> Once one rejects the flawed ideology that for the sake of superior economic performance, corporations should be run to maximize shareholder value, it follows that stock repurchases by established corporations serve no legitimate economic purpose. (2012, p. 33)

Moreover, it is clear again that the government has played a crucial role in the development of these norms. Specifically, Lazonick documents two important changes in the SEC's rules, in 1982 and 1991, which facilitated precisely the sort of price manipulation through

stock repurchases at issue. In these rule changes the SEC explicitly allowed these repurchases to proceed without fear of charges of manipulation. The 1991 rule change, moreover, allowed the executives who stood to benefit from such manipulation to realize gains immediately, whereas prior to this, exercised options were required to be held for a period before they could be sold at a profit. Such is precisely the matter at hand in the third degree of separation: the treatment of intangible assets as valuable in future sale, not in the second-degree differential advantages they represent.

Once business activity is dissociated from generating earnings by virtue of holding ownership stakes in the joint stock of knowledge there may remain no constraint within business activity itself on the range of business maneuvers that can be contrived for pecuniary gain. That is to say differential advantages in the third degree of separation are limited only by the imagination and gullibility of business itself. The result is a perpetual flow of financial innovations and an expanding and increasingly complex financial sector. For the sake of simplicity the proliferation of business activity which concerns itself with speculation on asset values as well as with the creation of and speculation on the value of assets derived from other assets will all be placed under the third degree of separation in the present work. It would, however, be more accurate to place business dealings, e.g. for credit default swaps and other financial derivatives, in a fourth, or perhaps even higher, degree of separation. In these cases the goals and means of those concerned are removed further still from the quality of conduct of the worker, from technological proficiency, from the vendibility of the going plant's output, and even from the vendibility of intangible assets derived from the business activities described.

It will be further noted that this species of 'pure' business is not necessarily confined to the phylum of finance, strictly speaking; it should, in principle, be understood as the ideal

business wherever circumstances afford differential advantages in the purchase and sale of intangible properties themselves. Likely the most salient example outside of finance proper are the so-called 'patent trolls', firms who accumulate patents for purposes of extracting license fees or damages through litigation (see, e.g., McDonough III, 2006; Risch, 2012). Because these firms do not develop the technologies on which these intangibles are based nor acquire them for the purposes of using that knowledge in any serviceable manner it is clear that their chief business strategies belong under the third degree of separation: business practice that lacks any proximate concern with the underlying industrial arts of the going plant, as defined herein.

This, again, follows from the nature of intangible property as an ownership right over differential advantages derived from the usufruct of the joint stock of knowledge. Walton Hamilton, in fact, recognized the essential nature of the situation long before the term 'patent troll' was coined:

> it is not the invention, but the militant use to which it can be put, that counts. The novelty may be incorporated into the process of production or put into cold storage. If put to use, it will presently become inseparable from the larger technology, called the know-how, of which it is part or aspect.… As a device for harassment, its employment demands the guidance not of a technician alone, but of the management and of the attorneys who shape the policies of the corporation. (1957, pp. 76–7)

Whether through the organization of financial markets on which assets are commonly purchased for no reason other than their future sale, or through the strategic hoarding of intellectual property rights, business activity itself bifurcates under the third degree of separation. On the one side there are those occupations and concerns whose aim is to control a portion of the joint stock of knowledge and to engender and maintain its putative value for the purposes of generating profitable sales of access to others. Intangible property is valued, purchased, held, and sold to realize a profit. This going 'plant' is thus functionally and legally entwined with the

going business of the business enterprise on which the intangible assets are based – e.g. IBM stocks in the portfolio of a mutual fund.

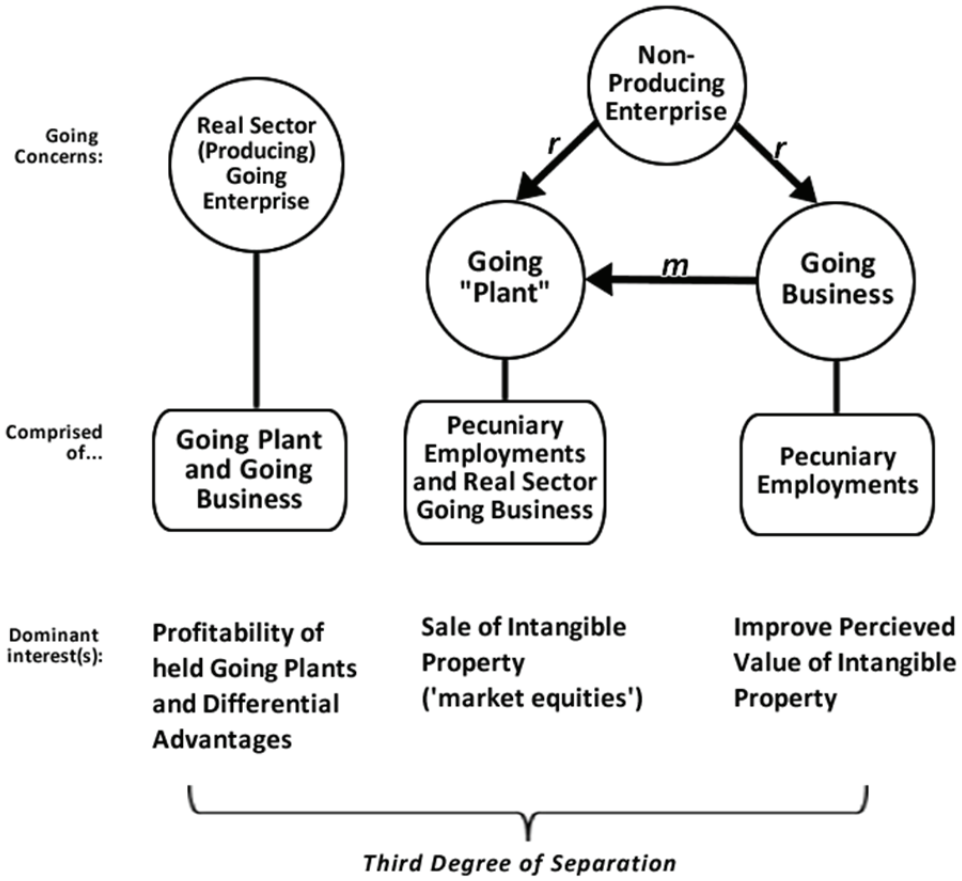

Figure 4 – The Third Degree of Separation

The third and final component of the going concern model is illustrated. As in figures 2 and 3 above, circles denote going concerns, beveled rectangles represent positions therein, and arrows indicate transactions according to Commons' taxonomy.

On the other side, however, business is concerned only with the vendibility of this property as well as assets derived therefrom. Neither the competencies of the underlying enterprise's going plant nor their putative value to users is of any importance to business on this side, except so far as these affect the expectations of earning-capacity of the assets to be sold or purchased. Yet this going business stands in relation to the going enterprise as the going

business is to the going plant – viz. as a superior engaged in managerial transactions directing the latter (see Figure 4 below). This latter approach to business will be termed here 'non-producing enterprise' (NPE); it is comprised, at least in part, of that class of employments for which Keynes (1936) famously advocated euthanasia.

Thus, in the third degree of separation there develops an enduring tension between the interest of business as a going concern in assets bearing future earnings and the interest of business in the purchase and sale of these assets on favorable terms. This latter class of business may, to the extent that it exercises discretion over firms that deal in the industrial system at all, direct both the business and industrial organization of the firm to the neglect of the long-term viability of the business enterprise (cf. Jo & Henry, 2013). The pattern of one group losing discretion generally while another is relegated to pecuniary outcomes is repeated here. Under the third degree of separation the going plant becomes incidental to the intents of the pure business manipulations of non-producing enterprise. The going enterprise, on the other hand, retains a degree of influence, but only through its impact on the putative value of the intangibles with which the NPE is concerned. Competitive pressures, e.g. by threat of takeover and those concerned with the general ideology of maximizing shareholder value, are likely only to exacerbate this inherent tension.

As indicated, the continuity of the business enterprise as a producing organization may be threatened by business activity in the third degree. Competition for higher returns, as in the second degree, is likely to compound this divergence of interests (Goldstein, 1995). As before, this threat is not wholly banished in the modern world, yet some measures exist to limit it. For instance, Galbraith (1967, pp. 80-81) argued, and more recent research (Jo, 2012) confirms, that firms finance investment internally. This is especially the case during recessions and growing

economic instability, and is recognized as a means of insulating the firm from intervention on the part of third degree business concerns. Just the same, the case has been made that the trend in the US, perhaps more so than anywhere else, has been toward increasing dominance of the third degree form of business (see Lazonick, 2012; Jo & Henry, 2013).

Conclusion

The preceding laid out the three degrees of the separation of production and consumption, or means and ends more generally, that characterize the modern business enterprise. In each of these, property rights constituted essential means by which the joint stock of knowledge, and the organizations tied to it, are managed in the interests of maintaining the firm in terms of ongoing profitable transactions. The next chapter will bring these essential concepts and arguments together to lay out the integrated going concern model of the modern business enterprise. It will also examine this model in the context of theories of the firm as well as related lines of inquiry in heterodox economics.

CHAPTER 4

THE GOING CONCERN MODEL OF THE BUSINESS ENTERPRISE, II

Chapter three discussed in some detail the three degrees of separation of consumption and production which frames the going concern model. With these components in hand, the next section will construct the model as a whole. Following that, a discussion of additional relatively recent developments will be given in order to investigate further the essential components of the model, as well as to use the model as a lens through which to understand these developments. Additional arguments concerning the model's contribution toward a heterodox theory of the firm are then given, followed by connections to related research within heterodox economics.

The Going Concern Model of the Modern Business Enterprise

As a starting point, the model takes part of the joint stock of knowledge – i.e. some component of the knowing, valuing, and doing which is "serviceable and requisite to the quest of a livelihood," (Veblen, 1908, p. 518) – as a kernel around which the hierarchy of business structures – themselves ongoing processes of knowing, valuing, and doing – forms. As discussed in chapter two, this notion of a structure of instrumental processes and relationships embodies both the industrial arts involved in turning the natural world to account as well as the arts of associated living necessary to cooperatively provision for the community as a whole. It is an heuristic 'starting point' from which to understand the potentially ceremonial characteristics of the institutions of modern business, rather than an historical reference point.

The ceremonial nature of the modern business enterprise, then, is understood as a series of disjunctures in the means-ends continuum by which groups engage in the social provisioning

process. These follow closely the three tiers of interest described in Veblen (1904, see esp. pp. 157-9). The initial point of separation occurs when production and consumption come to be treated as distinct realms of life, to be pursued each toward their own inherent purposes, or one toward the ultimate ends of the other – in any case, a "subordination of activity to a result outside itself," (Dewey, 1922, p. 265). As it pertains to the organization of modern firms, this separation involves a manipulation, or a reconfiguration, of the joint stock of knowledge such that individuals or organizations can be generally recognized and so treated as either delivering or receiving in the technological processes involved. This allows for the realization of pecuniary transactions between the two groups, the business enterprise and its customers, the users. In consequence of this, the user's participation must necessarily be constrained so that it justifies, or at least does not jeopardize, ongoing money transactions between the two.

The consequences for this first degree of separation are two-fold, and are very much as Dewey (1922) saw them nearly a century ago: the most immediate acts of producing – symbolized by tending a machine, though the argument is not limited to mechanized manufacturing – becomes a process by which those so engaged are alienated from their own conduct. Meanwhile, despite ubiquitous proclamations that 'the customer comes first', the interests of the users of the technological processes in question are served only so far as they can be translated into profitable transactions (Parker & Slaughter, 1993). The survival of the going plant *qua* business enterprise simply demands no less; and, while competition among firms may alleviate the users' subordination, this same competition reinforces the terms on which the firm struggles to survive.

In the second degree of separation the business interest of the firm is divorced from that of the going plant, creating the potential for the firm to be directed not toward the serviceability

of the firm's activities for the user, but for the vendibility of the activities thereof. With business so directed, the interests of workers who have little or no control, in law or in fact, over the joint stock of knowledge in question are further marginalized as the going plant itself becomes of consequence only insofar as it bears on the differential advantages which the firm can secure to generate profits.

Business activity is, in both of these stages, organized through the institutions of property which allow the firm to invest in and hold, to the exclusion of others, some portion of the joint stock of knowledge. However, in the second degree of separation, the business values directing the business enterprise are no longer immediately concerned with the nature of the industrial arts so encapsulated. Rather, the firm becomes concerned with any and all differential advantages that can be secured to promote the survival and growth of the going enterprise. The pecuniary value of the firm expands beyond the cost of recreating a functioning business capable of selling to customers ("going-plant value" in Commons, 1968 [1924]). It now encompasses all aspects by which the firm is able to create and maintain profitable transactions. Commons (1968 [1924]) referred to this as "going-business value" and argued that such circumstances necessitate an ethical consideration of the institutions of property and capital (to be discussed below).

In the third degree business becomes further removed still from the interests of the community in general, seeking to exchange property rights themselves at a favorable pecuniary discrepancy between the purchase and the sale. Whether in the form of financial institutions, so-called patent and copyright trolls, or simply the distinct and dominant belief within the producing firm that manipulation of the value of the firm itself should override the 'normal' business concerns of purchase, production, and sale of goods or services, the non-producing enterprise comes to control the direction of the business enterprise. The industrial firm as a going concern

becomes relevant only insofar as it bears on the potential to 'get something for nothing,' to use a term preferred by Veblen (1919), through advantages derived from the value of the firm's intangible assets themselves. The technological relationships of the going-plant, of course, become further removed from the public purpose of the non-producing enterprise.

Figure 2 presents a graphical representation of the going concern model as described above. The modern business enterprise is depicted in terms of the encapsulation, by degrees, of a kernel of the joint stock of knowledge. This 'encapsulation' is intended to reflect successive disjunctures between the processes by which, and the values for which, production and consumption are carried out in modern capitalist societies. One can image a table at which each interest in the industrial system and the firm itself has a seat. As the business enterprise progresses, in an analytical sense, through the degrees of separation a new group is seated at the head, and the previous groups move down the table. In the first degree the going plant finds itself at the head, with the user next, and the machine-tender, so called, furthest removed (perhaps, if the firm demands strict observance of etiquette, in the kitchen). In the second degree, the going business takes the head and the rest move down.[1] By the third degree, the non-producing enterprise takes this seat, by which point the firm has no immediate connection to the joint stock of knowledge encapsulated by the going plant. The machine tenders may, likewise, be so far removed as to be inaudible at the head.

In light of the model described above, it is clear that the boundaries of modern firms is no simple matter, whether of economizing on transaction costs or otherwise. Indeed, the present analysis suggests that the social relationships of a business enterprise involve several types of boundaries, overlapping and shifting according to the various interests, knowledge and values,

[11] Perhaps to get a clean cup.

which direct the going concern. Hence, a fully-formed business enterprise will consist of technical as well as business boundaries dividing positions on the receiving and delivering ends of a given technological process.

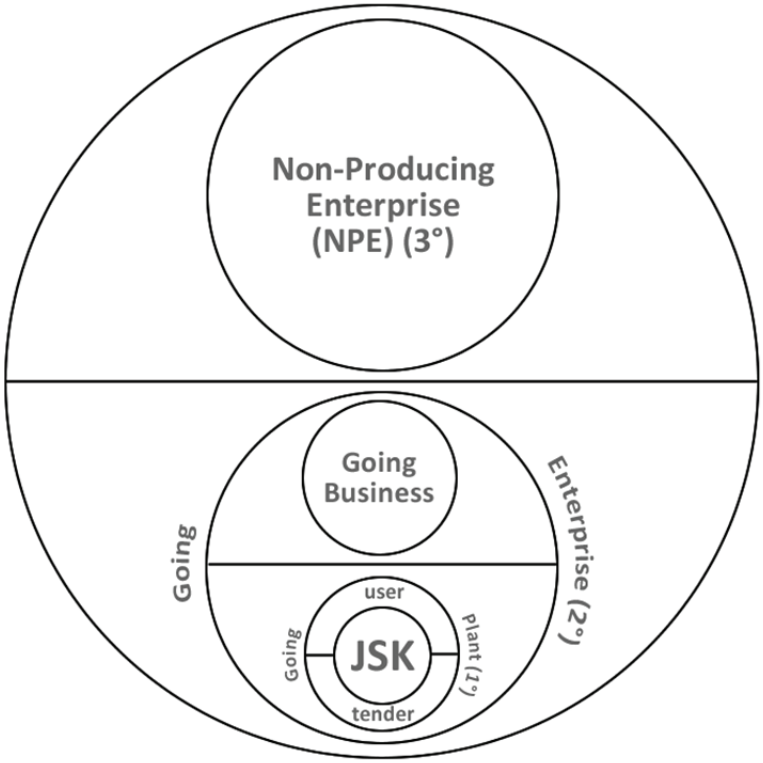

Figure 5 – The Going Concern Model

The modern business enterprise is represented above in terms of the essential business and industrial relationships involved. The position of each group (e.g. user, going business) indicates a supersession of discretion (interest) over the group depicted below it; and each dividing line indicates relationships structured so as to generate profitable transactions. The capitalization of these relationships, then, provides the basis for the next (higher) structure of business transactions.

From this perspective, the boundaries of firms are being drawn in the process of developing internal competencies; in the development and procurement of new machinery; in the hiring and organizational decisions of management; and in government policy, enforcement, and adjudication concerning these processes, and the rights and duties allocated to the different

parties involved. Technical boundaries may look perfectly natural, the result of an inexorable march of technological progress, but in fact reflect preexisting power relations (Marglin, 1996). Property boundaries, likewise, may obscure more or less intimate technological and business relationships, as well as the nature of the interests which hold sway over the rest of the enterprise. The boundaries of firms, as such, may reflect the technical expertise of its engineers or its marketing department, the shrewdness or ruthlessness of its upper management, or confidence of the securities markets at a particular point in time.

In each instance it is clear the boundaries and even the relationships over which these boundaries are drawn have not been dictated by any natural process of technological progress or organizational/institutional efficiency. Rather, these relationships must necessarily be understood as historically contingent outcomes of complex processes of institutional evolution and the exercise of human agency. These are fundamentally political, as well as economic, processes. A later section of this chapter will further explore the theoretical implications of conceiving firm boundaries in this way. Before that, however, consideration of additional facets of modern business may provide supplementary material by which to understand the model.

The Going Concern Model and Recent Developments in the Business Enterprise

The above described the modern business enterprise as a hierarchy of concerns by which the processes and interests of production and consumption have become separated by degrees. In that manner, firms are able to perpetuate themselves by maintaining a class of users who must purchase access to the joint stock of knowledge controlled by the firm. Firms then manage, stabilize, and compete through manipulations of technologies and property rights, tangible and intangible. Though the narratives discussed in the previous chapter take the story back into the industrial revolution, these characteristics of the business enterprise have persisted in many

forms despite notable historical change. A few of these relatively more recent developments are discussed below in order to further explore the model itself as well as its application to economic phenomena.

Many of the salient features of modern firms have been attributed to developments in the late nineteenth century and the rise of the large corporation (Chandler, 2002). Of particular interest here are the changing relationships of both skilled and unskilled work to the corporation in this time period. More specifically, it is seen that corporate and government policy shifted toward a more complete control of productive knowledge from those traditionally responsible for its maintenance and augmentation to the going enterprise.

Fisk (2009), for instance, describes how US law shifted in this time period toward standards of corporate ownership of workers' innovations through the development of trade secret law and the presumption of employer ownership of employee patents and copyrights. Evidence suggests that the jurisprudential evolution in question was a function of changing business strategies (see the comparison of DuPont and Reading Railroad in Fisk, 2009). The consequence was a loss of 'entrepreneurial independence' of the skilled engineers as they more thoroughly folded into the positions within the large corporation.

What is more, the shifting ideologies concerning the relationship between the corporation and consumers reinforced this trend:

> The realization of Thorstein Veblen's worst nightmare — a society dominated by idle consumers — enabled the transition from the nineteenth century's monopoly view of patent and copyright to the twentieth century's property view. The consumer's relationship to the product, which is partly constituted by corporate advertising creating an imagined affinity between the consumer and the corporate brand, determines the value of an innovation. (Fisk, 2009, p. 11).

As the courts came to recognize intangible property as an – in fact *the* – important investment of a firm, the public policy concerns of sanctioning control over industrial and aesthetic knowledge

shifted from limited monopolies to protecting firms' investments in the differential advantages on which business was based. Through a series of court decisions in the late nineteenth–early twentieth centuries, the law came to recognize both the physical and intellectual product of a corporation's workers as the property of the corporation. In this manner, and drawing on traditional notions of liberty of contract, the courts were able to "reconcile the emerging hierarchical control and loss of entrepreneurial opportunity entailed in the managerialism of factory and office work with the free labor ideology that had long dominated American thinking on the subject of labor," (Fisk, 2009, p. 82).

Management Theories and the Going Plant

Commons saw much the same issue in Taylorism, carrying "to the final limit that disintegration of the workman's skill and its transfer to the employer, which began a hundred and fifty years ago with the inventions of power machinery, the steam engine, and division of labor." (1919, p. 15; cf. Fisk, 2009, p. 82). Again, with this transfer of knowledge goes a transfer of values, or discretion in the future direction of the going plant: "The redefinition of work activities to separate planning, the prerogative of managers, from doing, the activity of workers, became the defining characteristic of 'scientific management'," (Best, 1990, pp. 55-56).

It is relevant to the present discussion to note that Commons' treatment of scientific management may not be wholly applicable to the ideas of F. W. Taylor himself and the Taylor Society. Nyland (1996) points out that Taylor advocated not just the application of scientific methods to improve productivity and fit workers' skills more closely with the 'one best way' of accomplishing tasks, but also a "friendly cooperation" between workers and management. The goal, then, was to produce 'maximum prosperity' for owners, management, and workers alike (Taylor, 1913). By the end of the 1910's, Nyland argues, the Taylorists in the Taylor Society

were in fact allied with several labor unions and fighting "an unrelenting campaign" against the Ford-type management programs which routinized work but did not permit participation among the workers.

Among the policies Taylor and the Taylorists advocated toward a more democratic organization of industry were the joint management-union appointment of engineers and a government tribunal to mediate conflict between workers and management. Importantly, these policies aimed to promote participation in the implementation of new industrial techniques among those who would actually be involved in carrying those processes out (Nyland, 1996). In this light, it would be prudent to acknowledge that while the implementation of scientific management programs very often did amount to a deskilling, speed-up, and presumably deeper alienation of workers, these were divergences from the visions of many of the doctrine's chief developers and advocates. Indeed, these same issues have in many ways persisted in the discourse of management.

The various epochs in management have each addressed the basic problem of a lack of congruence within the going plant, characterized (1) by an overriding interest, or public purpose, of the business enterprise in the value of operations to the user amenable to delivery through sale, and (2) by a structure that ensures the continuity of the concern in the face of competing organizations. This latter point, as Commons' (1919, p. 15) noted, ensures that any successful attempts by the machine tenders to assert an interest at the expense of technological proficiency will be "an empty victory," as they competitively disadvantage their employers and thus threaten the continuity of the concern and their own positions therein. The continuity of the going plant as well as the quality of conduct of the engineer and the user will likely remain, therefore, in conflict with the quality of conduct of the machine tender; and, far from mitigating or resolving

these conflicts, competition is most likely to reinforce this enduring tension. Recall that the user's discretion remains to the extent that the transactions it makes are bargaining, as opposed to managerial, transactions. Competition then can provide leverage for the user, but the stability of its fulcrum is provided for on the backs of the machine tenders. This argument, however, was not without its skeptics in Commons' time (see Nyland, 1996), nor should it be taken as a simple truism today, as further discussion will show.

Though approaches to intrafirm organization have gone through several phases since the era of scientific management, management methods have in many regards not changed substantially as they concern the issues at hand (cf. Aktouf, 1992). Notably, however, the management literature in the last half century has seen a recognition of the enduring tension between workers and users as a potential area in which new differential advantages can be created. Economists have more recently taken up the issue as well, as is perhaps best captured by Best's (1990) 'new competition'. Reflecting the management theories of Edward Deming, the Total Quality Management (TQM)[2] approach to intra- and inter-firm organization emphasizes worker participation in planning and problem solving, operational flexibility, and diffused responsibility for quality and design (cf. R. M. Grant, 1996).

To briefly illustrate, Best describes Toyota's initial success in looms which would shut down before they began to produce defective products. Workers could then oversee multiple machines without fear of break down, making them more productive without increasing the speed of their work. "Increasingly," Best writes, "the task of workers shifted from being mere operators of a single machine to maintaining machines and seeking process modifications so that

[2] See a general outline of the tenets of Total Quality Management in Goldstein (1997).

machines would not shut down. Thus workers became problem solvers as opposed to merely machine minders," (1990, p. 154).

As understood by Best and others, this constitutes an alternative approach to the organization of production described in the first degree of separation. The industrial arts are organized to limit the discretion lost by the machine-tender and thus alleviate, to some extent, the enduring tension that characterizes the first degree of separation. The modern business enterprise, however, does not pursue the integration of the interests of its employees and its users out of benevolence for either. It does so for competitive purposes. The dominant interests of business in the second degree – i.e. in differential advantages generating profitable transactions – may be directed toward new forms of organization that resolve some of the tensions described in the first degree, but only in so far as the result is positive on business grounds.

Given that any new management practice must not threaten the viability of the business enterprise, it should not be surprising that some have found claims of worker empowerment in TQM programs unconvincing. For instance, Boje and Winsor (1993) argue that these programs are in actuality a revival of scientific management practices (taken in the negative, common sense of the term) masked by postmodernist rhetoric. They note instances in which new practices ultimately led to speed-up and the careful design of programs "so as to avoid reconstitution into traditionally recognized 'trades'," (1993, p. 64). Parker and Slaughter (1993) share this skepticism on grounds that comport with the going concern model:

> Companies exist at the intersection of management needs for profitability and customers' needs for products. Since it is management which selects the customers to target and what products/services to offer them, it is a quality world built around management. Workers are not part of the main equation. Workers benefit in so far as they can be used effectively by management. (1993, p. 47)

Despite efforts to reconfigure the values of corporations so as to improve, and perhaps even humanize, the technological interactions within, there remains a strong overriding interest in profitable transactions at the boundaries. While some TQM approaches have embraced the idea of 'internal users', in which each receiving position in a technological process is the customer, others have rejected this formulation: Motorola's CEO in the early 1990s, for instance, declared, "For a while people at Motorola thought they had 'internal customers'. They don't. There is only one customer – the person who pays the bills. That's the person we're serving," (quoted in Parker & Slaughter, 1993, pp. 48–9). This is a clear example of the definition of the user in the going plant so as to effect and maintain profitable transactions.

As in the case of Taylor, the Taylorists, and scientific management, the issue with TQM and quality programs may be one of a good-intentioned theory and less-than-beneficent implementations. For present purposes, the matter bears on the nature and interrelationships between business in the first and second degrees of separation. Nyland's (1998) research sheds further light on this issue. Here the author finds that cooperative Taylorist programs, as well as other mutual-gains strategies in later periods, tended to be experimented with by firms facing declines in profitability or new, non-unionized competition. This suggests that management, typically the chief impediment to changes which would enhance employee participation, was more likely to pursue these changes when business pressures compel a search for new forms of differential advantage. However, Nyland (1998) notes likewise that firms typically abandoned such experiments when threats to profitability became more severe, as in recessions. One can interpret this as an indication that, while differential advantages may be possible through mitigating conflict and poor work conditions within the going plant, the general force of competition works to maintain these ceremonial patterns.

Setting these qualifications aside, the expansion of discretion among positions within the going plant has been advocated not only for the firm's employees and users, but also its suppliers (Goldstein, 1997). This last group, which might seem the most unlikely to be granted a substantial participation in the direction of the industrial processes of the supply chain, have in Best's 'new competition' been allowed to maintain, e.g., design capabilities which make the purchasing firm's products more competitive . This suggests one instance where the interest of the business enterprise in the vendibility of the product expands the discretion of the participating industrial occupations, rather than controlling them through routinization, mechanization, or other forms of hierarchical management. Chapters five and six will provide further illustration and critical analysis of this possibility. For present purposes, this bears on another relatively recent development which provides a suitable example through which to understand the going concern model of the business enterprise: trends in corporate restructuring beginning in the 1980s.

Corporate Restructuring

The 1980s saw a trend toward divestiture of the conglomerations of the 1960s and a return to specialization among US corporations. Langlois (2002b) has argued that this is a natural progression of technology returning the economy to the more market-oriented system that preceded the rise of the railroads and the large corporation, a trend away from Chandler's 'visible hand' of management, as well as from Galbraith's technostructure. Langlois' 'vanishing hand hypothesis' thus holds that the industrial arts will be directed so as to facilitate arm's length dealing – i.e. market coordination – between highly specialized business units, with the implication that this organization of the industrial system would "deliver the most value to ultimate consumers at lowest cost," (Langlois, 2002b, p. 6). This requires that the technical

interactions of firms be standardized, creating "[i]n an extreme – but far from rare – case, … a modular system," which allows for distinct organizations to comprise a functional system without the need for extensive communication between the component organizations. Property rights, then, "modularize social interaction," (Langlois, 2002a, p. 20) and firms develop where such organization of activities is more efficient than under a modular scheme. This 'modularity theory of the firm', like so many extant theories of the firm, appears to seek a description of the modern business enterprise which, in conjunction with the institutions of property and contract, denies the possibility of social costs occurring as a result of these institutions. The going concern model developed in the present work can be used to suggest a number of limitations of these theories, yet Langlois' hypothesis appears to drive a stake through the hearts of many of the essential tenets on which this model is based. Further investigation of this historical trend then is in order.

In the first, it is generally recognized (e.g. in Goldstein, 1997; Langlois, 2002b) that the divestitures of the 1980s constituted an exertion of power by investors over the management of the corporations involved. Goldstein finds that the literature dealing with the financial restructuring trend typically saw value to the firm as "any thing that increases the market value of the firm (in some formulations, 'shareholder value')," noting further that the buyouts of the 1980s had left management acutely focused on the dividends and appreciation of value of their companies' stock (Goldstein, 1997, p. 674). The prescription of this movement was that "corporate managers should evaluate and trade business assets and units to maximize market value," (p. 675). Direct discretion of the going business over the going plant was to be ceded to the investors.

The going concern model suggests that the vendibility and serviceability of the product, the quality and continuity of conduct of employees, as well as the survival and growth of the firm itself would be at best of secondary concern under these circumstances. Once firms come to be directed in the interests principally of non-producing enterprise, the interests of the going plant and the going business become, by definition, of only indirect concern. It should not therefore be surprising that the corporate restructuring trend of the 1980s and 90s involved a push to downsize employment and to cut costs and benefits to remaining employees (Champlin & Olson, 1994). Likewise, the GCM appears to comport with the observation that "40 percent of large management buyouts from 1986 ended in default by 1989," (Goldstein, 1995, p. 737). Langlois' own example of decentralization in home mortgage lending (Langlois, 2002b, p. 49), given before the social costs of third degree relationships in that sector had come to light, presents a clear case in which the efforts to justify a given organization of economic activities hides the ceremonial nature of that organization.

Secondly, to the extent firms have successfully restructured, e.g., through vertical dis-integration for second degree interests in profitable transactions, the going concern model would suggest that this would not necessarily occur in the interests of users for the most serviceable product at the lowest cost – i.e. the technological proficiency of the going plant. Rather, this reorganization of the ownership boundaries of industry will merely reflect recognition by dominant firms of new differential advantages. These may be due, e.g., as argued with Best's (1990) concept of the 'new competition,' to competitive advantages in product quality and production flexibility (see above). This does not, however, suggest a return to the so-called invisible hand of arm's-length market exchange. Consider, for instance, Coriat's study of the decentralization of production in a French automobile group, in which the author finds that

"[p]aradoxically,…the new regime means a greater integration or relationships between firms, even though it would seem that tasks and functions that were dealt with beforehand inside the firm have been thinned out and decentralized," (1995, pp. 220-221). This 'virtual integration' was, furthermore, found to be characterized still by hierarchical relations between the businesses involved.

What the vanishing hand hypothesis attempts is to take one of the most salient social costs of the modern firm, the alienation of members of the going plant from an understanding of the broader meaning of their work, with its concomitant possibilities for empowering those who continue to 'see the big picture' regardless of the benefit of their intentions, and to turn this into yet another efficiency rationale amongst the many that adorn the 'theory of the firm' halls. To the contrary, understanding intra- and inter-firm relations requires something other than efficiency rationales for observed economic behavior within and by firms. What is required is an analysis of the knowledge and values of distinct employments, of property institutions, and of their interaction, all with a view to understanding the degree of discretion (or control, or power) the various positions enjoy (cf. Gagnon, 2007; Munkirs & Knoedler, 1987). Short of this, it would seem unlikely that an economics of the firm could provide an understanding of the modern business enterprise as it has evolved over the centuries in the context of the wider social provisioning process.

The Ceremonial Dimension of Firm Boundaries

The issue of 'blurring' firm boundaries may be becoming increasingly recognized, specifically as it regards theories of the firm (Thrane & Hald, 2006). McCarthy, Fiolet, and Dolfsma (2011), for instance, take this and its complications for the traditional Coasean story of the firm as the starting point for their recent volume. The model presented herein does not

suggest any definitive or simple solutions to understanding these complex and evolving phenomena. It does, however, shed light on a few aspects of modern firms oft-neglected in extant theories of the firm; and it provides a lens through which to interpret these phenomena.

The GCM builds on heterodox economic theories which differentiate property- and technology-based relationships and dynamics, and understand firms as going concerns which, by definition, perpetuate themselves through time according to their internal logic and their relation to the wider social provisioning process. Consequently, the boundaries of the modern business enterprise are seen herein as the result of complex and hierarchical relationships maintaining, manipulating, encapsulating, and encumbering the instrumental processes by which communities provision for themselves the material and aesthetic means of life, all for the sake of generating profitable transactions. These processes are developed and perpetuated, then, to maintain and grow the resulting organizations, spawning the antagonistic class relations and enduring tensions that have long been recognized as defining features of capitalist economies. From this perspective, the dynamics out of which firms spring are surely better described as 'political' than as 'economizing'; and the boundaries of firms are better seen as the result of gerrymandering in the interests of the dominant positions within firms, industries, and governments.

To be sure, reference to this long-standing and notorious practice of political redistricting is not made in jest here. The GCM has been developed with an explicit intent to understand how the institutions that govern the provisioning process in modern capitalist economies have evolved in a manner that creates the potential for entrenched ceremonial characteristics, both in the individual conduct dictated by positions within the firm as well as the wider social relationships in question. The present section will elaborate further on this subject.

Ownership Boundaries

As a starting point, the boundaries of firms are most salient in the ownership rights over industrial equipment as well as contractual relationships with those responsible for operating those units. These were the boundaries that concerned Veblen when he wrote, "[s]o long as related industrial units are under different business managements, they are, by the nature of the case, at cross purposes..." (1904, p. 48). In view here are the legal boundaries defined typically by non-pecuniary transactions within concerns, and pecuniary transactions between them. Presumably these are the same boundaries that concern Williamson's firms vis-à-vis 'technologically-separable interfaces' (Williamson, 1985; see also Knoedler, 1995). However, Williamson, and the Coasean enterprise more generally, reasons backwards from ownership rights to technological relationships, from efficient, or non-wasteful, organizations of production to the conditions that must exist for these organizations to be efficient. It thus begs the question at hand.

In fact, the model developed herein suggests that certain fundamental qualities of the modern business make waste an inevitable, integral part of 'doing business'. At issue here is the management of the industrial system, or social provisioning process or machine process, at large. Central to the functioning of this system is, as Commons (1968 [1924]) referred to it, the joint willingness of the many parties to participate in the process. The analysis of the previous chapter suggests that while the whole complex of processes does indeed continue, it does so perforce wastefully. The reason: "A pecuniary discretion has to be exercised at every point of contact or transition, where the process or its product touches or passes the boundary between different spheres of ownership." (Veblen, 1904, p. 46; cf. Knoedler, 1995; and Mayhew, 2008, pp. 85–6). As a result the smooth functioning exchange between the industrial units, the

'technologically-separable interfaces', as well as the implementation of improvements in process, product, and coordination are made to suffer the drag of business sagacity.

Again, under the second degree of separation, there exist social costs to the extent that the overriding interest in creating and maintaining salable points of access to the joint stock of knowledge creates wasteful, destabilizing, maladjusted, misdirected, and degrading practices that would not be the case were the going plant's discretion not superseded by the going business. The modern business enterprise thus involves an enduring tension between the interest in technological proficiency of the going plant and the interests of the going business in devising, perpetuating, and capitalizing differential advantages. And again, competition does not ameliorate this essential conflict; it fuels it. From this perspective, boundaries are being drawn through legal ownership as well as interlocking directorates, customer loyalty and market-sharing agreements, non-compete contracts and supplier contracts, and on and on. A firm's portfolio of intangible assets and the formal and informal relationships of its employees all become important indicators of its functional boundaries.

Drawn in this manner, these boundaries enable those who collect incomes from the going enterprise to access the wider social provisioning process. That is, the competencies, or resources, of the firm are leveraged through controlling access to the encapsulated joint stock of knowledge so that members of the firm have access to other parts of the joint stock. Because the need for access to the social provisioning process is perpetual, it only stands to reason that firms will be constructed, boundaries drawn, so as to generate profitable transactions indefinitely.

Technological Boundaries

But, ownership boundaries themselves have been laid on top of technological boundaries; and, as suggested previously, these technological boundaries may also have ceremonial

characteristics. The going plants which make up the wider machine process have been developed, whether by will or of competitive necessity, such that the great mass of those most closely involved in their day-to-day operation have little intellectual discretion in how they are constructed, organized, or developed.

Denying such participation amounts to denying the going enterprise the contributions of these alienated members toward the present functioning and future development of the concern. This amounts to a ceremonial quality to the organization of business over and above that which can be found in the diminished quality of conduct among the machine tenders, as well as the users, to the extent that their discretion is relegated to purchasing decisions. In these terms, the enduring tension within the going plant constitutes a potential social cost arising from the stymied contributions of the machine tender and the user to the going plant.

The presumption among economists and others has been that a system of monetary compensation is sufficient to align the interests within the firm in the absence of general participation in the direction of the organization itself. On the contrary, it has been recently observed that the diminished quality of conduct among the laboring positions in many cases diminishes the value to the user by way of lowered productivity. To give just one example of the theoretical implications of these observations, Frey (1997) has found that extrinsic motivations such as financial compensation for performance and the threat of dismissal often 'crowd out' intrinsic motivation to accomplish tasks.[3] The results include a recognized diminished well-being of the worker, lack of integration with the goals of the organization, and lower productivity

[3] See, e.g., Baard, Deci, & Ryan (2004), Van den Broek et al. (2008), and Grant (2008) for recent studies using Self-Determination Theory to analyze these effects in work settings. Additional references have been collected at http://www.selfdeterminationtheory.org/.

– that is, the diminished quality of conduct of the worker and frustrated congruence within the going plant. These findings would surely not have been surprising to Dewey:

> If productive activity has become so inherently unsatisfactory that men have to be artificially induced to engage in it, this fact is ample proof that the conditions under which work is carried on balk the complex of activities instead of promoting them, irritate and frustrate natural tendencies instead of carrying them forward to fruition. (1922, pp. 123-124)

The other side of this coin is the end-user. The materialism which is problematic in the organization of work has been found more generally to be nonconducive to the satisfaction of basic psychological needs. Kasser (2002), for instance, argues that materialistic values can develop through perceived discrepancies between what one wants and what one has. Worse still is that, even when these desired levels of material possession are attained, they are often found to be unfulfilling, leading to still greater desires for more wealth. These values thus become entrenched through individual (arrested) development, in addition to the cultural norms which associate material success with intelligence, status, and so on (Kasser, 2002, p. 53; Kasser & Ryan, 1993; Kasser, Kanner, Cohn, & Ryan, 2007; cf. Veblen, 1901).

Stability and the Social Provisioning Process

Despite the multitiered ceremonial potential of the modern firm described above, there remain certain limiting factors to this structure. These ultimately are found in the dependencies of business on the underlying community and its technological processes which afford it the opportunity to turn a profit. As Veblen noted,

> A disproportionate growth of parasitic industries, such as most advertising and much of the other efforts that go into competitive selling, as well as warlike expenditure and other industries directed to turning out goods for conspicuously wasteful consumption, would lower the effective vitality of the community to such a degree as to jeopardize its chances of advance or even its life. (Veblen, 1904, p. 65)

The processes by which the vendibility of the product are promoted cannot go so far as to threaten the continuity of the user positions on which the firm relies for its earnings – at least not indefinitely. Nevertheless "owing to the very high productive efficiency of the modern mechanical industry, the margin available for wasteful occupations and wasteful expenditures is very great," (Veblen, 1904, p. 65). Taking Veblen's cue, the GCM is useful in further understanding those factors which limit the ceremonial waste and maladjustment that attend the business enterprise, as well as the processes by which stability qua mitigation of the inherent conflicts of the firm is pursued.

In the framework of the GCM, it is evident that the survival and growth of the business enterprise at each stage, or degree of separation, depends on the survival of the organizations on which it is founded. The going business which dominates the going enterprise requires a going plant from which to draw an income continually. The going plant which requires a staff of workers to tend the machines cannot arrange technological processes such that workers are unable to do so. Presumably, business which operates solely on the favorable trades of intangible assets cannot survive if the industrial and business relationships on which these assets are putatively based die off (cf. Jo, 2012, pp. 8–9). All of which is to suggest that the instrumental functions which the modern firm encapsulates cannot be entirely snuffed out in the pursuit of profits. Rather a degree of stability must be found that allows profitable transactions to persist in spite of the conflicts indicated.

Recognizing this, histories and theories of modern firms in the heterodox traditions have often focused on the processes by which stability is developed. Galbraith's (1967) technostructure, for instance, exemplifies a common solution to the inherent conflicts between the going plant and the going business. Likewise, developments in management theory, as

discussed in the previous section, have generally been aimed at the amelioration of conflicts between the interests of the firm's customers and its workers.

Nevertheless, it is clear that attempts to mitigate these conflicts developed by the business community itself are, from an instrumental standpoint, constrained by the same conflicts they seek to address. As the previous section discussed, the movements in management theory and practice in the twentieth century tended to find management as the force impeding more cooperative forms of organization. As in Veblen's discussion of industrial consolidation (see chapter three above), change which appears warranted on instrumental grounds must wait on business interests to find its implementation advantageous on business grounds. Hence, rather than a slow trend toward industrial democracy on the accord of business itself, what develops in the way of stability is a governance structure which regulates competition but does not collapse the hierarchical structure of firms involved (cf. Lee, 2013b).

It is clear, then, that the means of establishing stability for a firm, market, or industry will very likely involve some degree of shifting, as opposed to ameliorating, instability and conflict between the concerns and positions involved (cf. Mayhew, 2008). This is perhaps most familiar where the burdens on the conduct of the engineers and users within the going plant, created by the perpetual struggle for pecuniary gain by business in the second degree, are shifted onto those who bear the burden in the first degree: the machine tenders. Veblen in fact recognized this in an oft-overlooked passage of the *Theory of Business Enterprise* (1904, p. 65): “There seems...to be no tenable ground for thinking that the working of the modern business system involves a curtailment of the community’s livelihood. It makes up for its wastefulness by the added strain which it throws upon those engaged in productive work.” Of course, an unnecessary strain on the members of a community *is* a curtailment of the community’s livelihood.

In much the same vein, Fisk's (2009) description of the changing norms of corporate ownership of employee innovations demonstrates the process of stabilizing markets through shifting instability off of the dominant interests of the firm. Specifically, Fisk describes the process by which the burden of competition was shifted onto engineers who could no longer make claims on access to the joint stock of knowledge by virtue of intellectual property protection of ideas attributable to them. In this manner, established firms were insulated from potential competition from former employees – for instance, engineers who, having left the employ of a company, go on to develop innovations which could materially disadvantage their former employers on competitive terms. In this way, competition among firms, actual and potential, is arrested, while competition for employment at established firms is amplified. Instability in terms of the access to the social provisioning process is shifted from those whose incomes derive from the business enterprise to those who would offer technical and innovative services to the enterprise.

The social provisioning processes of modern capitalist societies are directed substantially within and between the complex organizational structures of firms, with the common goal of creating and sustaining profitable transactions through the manipulation of technologies and property rights. The accumulation of property rights serves as the means by which those whose incomes derive from control, rather than use, of the joint stock of knowledge secure access to the social provisioning process (cf. Lee, 2011, pp. 22–3).

Stated alternatively, the separation of production and consumption through the structure of modern firms constitutes a series of disjunctures between means and ends, knowledge and values, in the provisioning process. In consequence, the use, maintenance, and improvement of

the joint stock of knowledge are carried on for purposes which are necessarily different from, and very likely at odds with, the interests of the community. Dewey keenly noted this situation:

> [T]he whole tendency of modern economic life has been to assume that consumption will take care of itself provided only production is grossly and intensely attended to… As a result most workers find no replenishment, no renewal and growth of mind, no fulfillment in work. They labor to get mere means of later satisfaction…. Socially, the separation of production and consumption, means and ends, is the root of the most profound division of classes. Those who fix the 'ends' for production are in control, those who engage in isolated productive activity are the subject-class. But if the latter are oppressed the former are not truly free. Their consumptions are accidental ostentation and extravagance, not a normal consummation or fulfillment of activity. The remainder of their lives is spent in enslavement to keeping the machinery going at an increasingly rapid rate. (1922, pp. 271-272)

The positions which dominate production, business in its many forms, assert claims on the material and immaterial industrial apparatus of the community. Production and consumption both become needlessly circuitous, marked by waste and delay, as the skills of those in dominant positions come to have less and less to do with the actual, material, technological processes involved in the provisioning process. The processes by which intelligent and participatory control over the natural world are exercised become characterized by conflict and arrested development for all involved. The boundaries of firms, then, are more than simply reflections of this inherently ceremonial structure; they are, in fact, the result of efforts to maintain, to stabilize, this structure in accord with the dominant interests therein.[4]

Connections to Related Research and Public Policy

This and the previous chapter have developed and explored the going concern model of the business enterprise. The chief purpose of this model is to contribute to an alternative, heterodox theory of the firm. However, being drawn from several traditions within heterodox

[4] Cf. Lee (2011, p. 22): "The business enterprise is a specific social organization for coordinating and carrying out economic activities in a manner that mirrors the social relationships in capitalist society and, most importantly, reproduces the capitalist class itself."

economics, as well as from disciplinary sources outside of economics proper, this model should be found to be complimentary to other fields of research in economics and the other social sciences. Before concluding, brief discussion of these related fields will be given in terms of the potential connections to be drawn.

First, the going concern model has clear affinities with heterodox theories of the business cycle that focus on structural instability and the financial sector. Papadimitriou and Wray (1998), for instance, discuss the contributions of Hyman Minsky, drawing connections to many of the same authors on which the present model is based (see also Tymoigne, 2003). The issues of instability, uncertainty, and active attempts to stabilize organizations in the face of uncertain conditions are common threads throughout much of heterodox economic theory, as well as economic sociology (e.g. Fligstein, 1996). These same issues will be of central concern in the empirical component given in the next two chapters.

Second, the model developed herein should fit nicely with the broader agenda of heterodox microeconomic theory, and in particular Post Keynesian pricing theory. From that perspective, and in contrast to mainstream economic theory, prices and profits are ultimately determined through the structure, causal mechanisms, and agency that make up an economy as a going concern (see Lee, 2011). Investment needs and maintaining access to the social provisioning process for the dominant interests play a central role in this framework in the determination of prices and profits (Lee, 2013a).

Moreover, the amenability of the GCM to existing and ongoing research in heterodox microeconomics creates the potential for further development of the former with additional historical, empirical, and theoretical content. For instance, the accounting constructs of historical cost and the going concern which were important developments in the organizational structure of

modern firms could shed further light on the ways in which the hierarchy of concerns involved in the business enterprise are connected, as well as how these have developed through time. Likewise, the GCM may be useful in analyzing the inter- and intra-organizational relationships which shape pricing and investment decisions, calling particular attention to the interaction of technological and property-based structures and points of agency.

Finally, the GCM was developed in consideration of the economic sociology of market governance and the potential for further connections is clear. For instance, the issue of stability and the processes by which stability is pursued among market actors is a central issue within this related literature (see, e.g., Fligstein, 2001) as well as the model developed herein.

One particularly important issue emphasized in the market governance literature is that of public policy as it regards the firm. Though the matter is more complex than the present note can address, a general observation can be made: if the overriding aim of the business enterprise can be accurately characterized as sustaining itself through profitable transactions resulting from the control and manipulation of the joint stock of knowledge, then it stands to reason that public policy must be concerned with the reasonableness of the practices by which this is effected. Any society which organizes production through for-profit firms must come to terms with the essential conflicts between the community's need to access its 'immaterial equipment' and firms' needs to limit the very same access.

Stated in these terms, the public policy issue appears as an issue of property rights, especially intellectual property rights, wherein the long-held balance sought in public policy has been between the community's interest in disclosure of useful knowledge and the interests of the originator of this knowledge in compensation for its development. But, while the various fields of intellectual property law are often considered a separate province, there is reason to believe,

and the going concern model suggests, that this same legal balance sought under capitalist regimes is to be found at least in antitrust law (Bartkus, 1976), and likely beyond (cf. Commons, 1968 [1924] esp. ch. 5 and the "ethical concept of capital and property"; Fisk, 2006).

Rather than expanding on this argument here, the matter will be left for the empirical component of this dissertation, comprised of chapters five and six. The following chapters, then, will take the evolution of the computer industry as a more detailed illustration of the going concern model. Of particular concern will be the development of (1) business interests in the technological concerns, (2) business strategy in creating differential advantages and stable markets, and (3) the role of the state in facilitating these processes. Concluding discussion in chapter six will return to this central issue of public policy as viewed through the lens of the going concern model.

CHAPTER 5

THE GOING ENTERPRISE IN THE COMPUTER INDUSTRY

The present chapter, as well as the next, will apply the going concern model to the computer industry, exploring a number of cases from the history of this industry in order to illustrate some essential features of the model. New industries do not come pre-formed with stable customer-firm relationships nor with stable competitive relationships; these must be developed intentionally through the interaction of organizations, concerns. The narrative that follows illustrates an instance in which firms, in conjunction with legislative and judicial bodies, established the institutional schema which would allow for the degrees of separation to exist with some degree of stability.

This industry, and specifically software as a technology and a product, was chosen for a number of reasons. First, it is a relatively young industry, characterized by continual technological change and salient processes by which new property institutions have been created to allow business to stabilize the technology for sale. Of particular interest in this regard is the application of copyright protection to computer software. A central component of the going concern model is the organization of industrial relationships so as to create profitable exchanges for access to needed social knowledge as well as the control of the development of this knowledge. Because the public purpose of copyright law is to sanction these relationships while at the same time allowing further incremental development of the joint stock of knowledge to go forward, it is expected that this area of law and economics will provide a relatively direct view the relationship between the law and the business enterprise (see chapter one for further discussion).

Furthermore, though the present analysis cannot claim absolute generalizability for modern economies, the computer industry has nonetheless been chosen in part for its important role in contemporary industrialized countries. The industry is of economic relevance to the modern economy, both in the US and elsewhere, though its treatment by heterodox economists remains relatively limited and recent.

Finally, the findings discussed herein will have broader implications for the so-called 'new economy'. Gagnon suggests that the analysis of the 'new economy' should, from a 'Veblenian perspective,' be framed in terms of "identifying socio-institutional transformation that will allow a greater capitalist control over technological capacities and knowledge," (2007, p. 598). Related questions include: "1) How are the legal structures of ownership evolving to enable firms to exert control over knowledge? … 2) What are the main intangible assets (differential advantages) in the 'New' Economy" (p. 598). These will be addressed in this and the next chapter.

In the present chapter the focus is on exploring the organization within and among business enterprises in relation to the joint stock of knowledge; or, on the dynamics of the industrial and pecuniary relationships within the industry. Fligstein (2001 esp. p. 225) suggests one line of questioning which ought to be addressed in this regard: what conceptions of control have developed, or will develop to produce stable market outcomes? And these will comprise part of the subject of the present chapter. However, the going concern model addresses more than the organization of business toward stable and predictable relationships; it also looks to the organization of industrial occupations between and within firms, and their relation to the business methods and motives of these firms. As such, it is constructive to look first at how

technologies have been developed in the absence of a direct business control, and then to the influence of, and consequence for, business in the industry.

The issue then is to understand the nature of the going plant and the relationship between the going plant and the going business. This relationship involves the definition of a technology – or more accurately technological processes – with and through which engineers (producing and using) interact *via* purchase and sale. This is the nature of the firm in the first degree of separation, prior to the dominance of the going business. Under the second degree of separation, the interests in creating and maintaining profitable transactions through differential advantages managed by intangible property relations supersede the interests of the going plant. The boundaries of the firm as they are commonly perceived are drawn and redrawn in this manner, a process governed by the strategic control and manipulation of the joint stock of knowledge and the way individuals and groups value the same.

To understand the business enterprise, then, it is necessary to understand how the firm develops competencies in the relevant technology *and* how it 'captures' (restricts access to) this knowledge while maintaining the value of that knowledge to those outside of resulting firm boundaries. Analyzing an industry in this manner requires consideration of the historical motives and methods identified with the various functions of the relevant occupations in the industry. This is complicated by the ever-evolving structure of an industry, and it must be remembered in delineating industrial and business behavior that classes of employments are not the same as, or coterminous with, groups of people (Veblen, 1901). Indeed, the industry in question here is replete with notable men and women who blur notions of technology, marketing, property, and so on. The real challenge in this is in separating the pecuniary from the industrial motives and methods, which are in general very thoroughly intertwined in any of the texts

specific to the industry. For this reason, illustrations from business practice have been given alongside discussion of cases wherein business practice has not been central – e.g. in the development of Unix by academics, or the critical views of Free Software Foundation co-founder Richard Stallman on proprietary software. This is intended to provide a comparative structure which is not based strictly on the standard principles of business.

The following section will lay out the essential technological nature of computers and the implications of this for the analysis of the industry with the going concern model. Subsequent sections will provide illustrations of how software technologies were developed, exchanged, maintained, and augmented, as well as the historical approaches of businesses methods toward these technologies. The narrative will move from the early years of computer software, before the technology was itself treated as a salable product, to the 1980s, when software became an important business asset in the computer industry. In doing so, some of the key concepts of the going concern model – the joint stock of knowledge, the going plant, the going business, and their relationship – will be demonstrated in this particular empirical context.

Before proceeding it is worth noting that terms like software, applications programs, and systems programs did not simply develop as obvious reflections of the technologies to which they refer; this nomenclature, rather, reflects both the evolving structure of work with computers (Akera, 2001) as well as the inter-firm organization of programming (Band & Katoh, 1995; Haigh, 2002; Kelty, 2008). Similar remarks can be found concerning relevant legal terms (e.g. Stallman, 2004). For present purposes, the more-or-less contemporary meanings of these terms are used. While this inevitably results in somewhat anachronistic terminology, efforts have been made to prevent any distortion of the relevant history that could potentially result.

Technology as a Going Concern: The Case of Computer Software

Computers, and information and communication technology more broadly, are characterized first and foremost by their interconnected, hierarchical, and rapidly evolving nature. The present section will give a rough outline of these characteristics, define important terms, and argue that technologies in this industry can constructively be treated as going concerns in their own right. This allows for the application of the going concern model to the history of the industry by the translation of views of those working in and those studying the industry.

To paint a very general portrait of the structure of the technology, computers are comprised of the following. Hardware consists of the physical components that process calculations, store data, facilitate interaction with humans, and so on. Software comprises the instructions that control the computer hardware, including firmware embedded in the hardware's fixed memory; as well as systems programs designed for direct control and maintenance, for creating and editing programs, and for executing application programs. Operating systems – e.g. Microsoft Windows, Unix, or Linux – are an important type of system application which act as the central interface between application programs and hardware. Application programs in turn are those that people use to accomplish tasks not directly concerned with the operation of the computer itself – e.g. building a website, creating a spreadsheet, or writing a dissertation (Campbell-Kelly, 2003). The artifacts of computer software exist as source code and object code. Source code consists of human-readable text including commands for the computer to carry out, the structure of these commands, and comments by the programmer. Source code must be 'compiled' into object code for the machine to understand these commands. Object code,

in turn, is generally unintelligible to humans except through cumbersome processes of reverse engineering the object code back to source code (Band & Katoh, 1995).

The complex structure of modern computing, however, is not limited to this basic structure. With networked computing the hierarchy can be extended beyond the individual computer 'on top of' which layers of software are written, and into relationships between computers in vast networks. Sun Microsystems was perhaps the first to capitalize on this idea as a marketing strategy when it coined its now famous slogan 'the network is the computer' (see Hall & Barry, 1991; Southwick, 1999; and discussion in next chapter).

Taken individually none of the technologies described is likely to have much use for anyone. It is commonly understood that these components must *interoperate* to be of value. However, though the idea may seem obvious and trivial, interoperability, or compatibility between pieces of hardware and software, is more complicated than it might seem at first glance. As Band & Katoh explain (1995, pp. 5-6) interoperability entails both interchangeability – the ability for one program, e.g., to substitute for another – and connectability – the ability, e.g., for a program simply to 'work' with another program, like an operating system, or with hardware (see Samuelson, 2008 for a more in-depth discussion of the meaning of "interoperability"). The issue of portability – "the ability to move software…from one machine to another," (Kelty, 2008, p. 123) – can be added to the list of issues concerned with ensuring that these complex systems of discrete components function. Finally, systems commonly treated as wholes are referred to as 'platforms', defined as "a cluster of technically standardized components that buyers use together with components to make applications," (Greenstein, 1998, p. 43). For the most part, issues of interoperability will be reserved for the next chapter; they are relevant here to

emphasize the interconnected nature of the technology, and hence the social relationships involved therein.

It has been recognized that software is generally not a static artifact of the joint stock of knowledge, but quite often an evolving concern in its own right. As Campbell-Kelly has described in his history of the technology,

> [o]nly weeks after the first prototype laboratory computers sprang to life, it became clear that programs had a life of their own—they would take weeks or months to shake down, and they would forever need improvement and modification in response to the demands of a changing environment. (2003, p. 29)

While some software may be written, distributed, and left for inevitable obsolescence, much of the more important software, for instance in operating systems, are written, maintained, and augmented over decades. Campbell-Kelly again explains:

> This does not mean that a twenty-first-century operating system necessarily contains code from the 1960s; it means that over time the code has been replaced and re-engineered piece by piece. In this sense, an operating system is analogous to a human organization: workers constantly enter and exit; eventually, none of the original workers are left, yet the organization itself lives on. (Campbell-Kelly, 2003, p. 144)

This is all to say that software - and the argument could be extended to information and communication technologies more generally - is a prime example of technologies exhibiting the institutional economics understanding of the joint stock of knowledge. Sophisticated programs, whether an operating system like Unix or a simple controller for a printer (see Williams 2002), are developed, distributed, and changed by one group of programmers or another over relatively long periods of time, while the integrity of the software's identity is maintained. The processes involved therein thus constitute going concerns, actively maintained by engineers, though persisting beyond the tenure of any given group of engineers.

The history of computer software provides an excellent illustration of the concepts and arguments laid out in previous chapters precisely because the nature of the technology as a going concern is so easily identified, both in its existence and its evolution. The illustration is made even more pertinent in that the technology only recently became a prominent concern among businesses. Prior to the late 1970s, as will be discussed in more detail below, software was treated by firms as ancillary to the profitable transactions pursued by both the producers and users of computers. The process of making software itself a vendible product, then, provides an apt illustration of the imposition of going plant and going business interests on the joint stock of knowledge and the implications thereof.

Software before Unbundling

Though the technologies that have come to be called software can be traced back to the early twentieth century, it was not until 1970 that the reigning firm in the industry, IBM, 'liberated' the software industry by pricing its software separately from its hardware. It was another decade still before software as discreet products became the dominant mode of exchange in this technology (Campbell-Kelly, 2003). The present section will explore the treatment by firms of software technologies prior to 'productization' in an effort to expose the organizational structure within and between firms vis-à-vis the industrial relationships concerned with computer software.

The most telling example of hardware providers' relationship with users in terms of software in this era is the computer user group, of which IBM's SHARE group is a salient case. In 1952 R. Blair Smith, a sales manager for IBM, first proposed the computer user group, establishing the Digital Computer Association, which would become SHARE, for users of IBM's 704 mainframe. SHARE's functions were (1) to organize users of IBM's machines to minimize

redundant programming, and (2) to act as a technical intermediary between the users and IBM (Armer, 1956; Campbell-Kelly, 2003). As Akera (2001, pp. 716-717) has noted, SHARE "represented a viable organization, a going concern, around which computing specialists could assemble a broad range of new expertise." The joint stock of knowledge as it concerned the software aspect of the operations of the member firms, including IBM, was thus formally recognized by the interested parties, and it constituted a going concern by virtue of the agency exercised by the engineers involved as sanctioned by these firms.

The collaborative nature of this user group is well documented. SHARE's earliest members consisted of Southern Californian aerospace firms that had developed a cooperative tradition during World War Two. As SHARE's membership expanded, this guiding approach was codified, as evidenced by a statement adopted by the group in February 1956:

> The principal obligation of a member is to have a cooperative spirit. It is expected that each member approach each discussion with an open mind, and, having respect for the competence of other members, be willing to accept the opinions of others more frequently than he insists on his own. (quoted in Akera, 2001, p. 719)

The technical focus of the group was, likewise, clear in the conditions of membership: having a 704 installed or on order. Indeed, larger firms would have distinct representatives from each division with its own installation. This is to say, importantly, that the technical relation to the technology, rather than the ownership boundaries of the firms, dictated the organization of the group.[1] Thus, engineers on the user side of the going plant relationship with IBM pursued

[1] This sort of relationship, even in the presence of for-profit firms with clear interest in the technology, is, of course, neither new nor uncommon. See, for instance, Fisk (2009, pp. 89–90, 122) on the development in the nineteenth century of engineering schools, professional societies, and periodicals with the express purposes of facilitating the dissemination of technological knowledge. These were found in many technological fields, including machinery, industrial chemistry, and the 'basic technologies' concerned with railroads. As Fisk (2009, p. 122) notes in the case of the railroads, openly sharing information was the norm because firms here did not compete through the control of technologies themselves, but rather

extensive collaboration and planning, coupled with a non-proprietary treatment of technological artifacts, in an effort to improve the quality of their purchased machines as well as to mitigate redundant and costly work.

Other user groups were established in the mid-1950s, again around the technological architectures created by the mainframe producers, including Remington Rand's Univac Scientific Exchange (USE) and GUIDE for IBM's 702, 705, and 650 computers (Campbell-Kelly, 2003). The concept of the user group has since extended into a host of other technologies – e.g. copiers, programming languages, operating systems (Dorn, 2000).

This era marked what might seem a peculiar strategy on the part of IBM and its customers: actively orchestrating development between users and the vendor without any over-riding assertion of property rights in the results. IBM's open-source approach to software, however, "made a lot of sense" in the 1950s:

> hardware was the fundamental source of revenue, customers (who accounted for most of the programming) needed access to the source code to customize the system software and create applications, and the hardware machines that IBM's competitors had on the market were incompatible with IBM's software. (Campbell-Kelly & Garcia-Swartz, 2009, p. 230; cf. Kelty, 2008, p. 121)

It was in the technical interests of the users, who required expensive and time-consuming customization of their IBM mainframes through programming, to freely share the results of these efforts so as to distribute development costs. It was likewise in IBM's interest to encourage software development by providing the source code to its own software free of charge.

That software was not treated as a vendible product is not to suggest that it was considered commercially insignificant by hardware vendors. To the contrary, software development prior to IBM's unbundling was an essential part of the business models of the

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through the control of geographical territories.

major computer manufacturers, where it was treated as a marketing tool for hardware sales (Campbell-Kelly, 2003, p. 98). Software treated as a marketing expense, in fact, dates back at least to the 1930s with IBM's published accounting applications for its punch-card accounting machines (Campbell-Kelly, 2003, p. 30). Software provided 'free' with hardware, as well as maintenance and training services, "followed a long tradition in the data processing industry that predated computing platforms: the main objective of providing a bundle was to increase the demand for the platform by supplying a full 'solution' to customers," (Campbell-Kelly & Garcia-Swartz, 2009, p. 233). The user group had provided this customer support in the 1950s; however, the major computer vendors eventually developed their own competencies in systems programs, diminishing the discretion enjoyed by users through the user group (Campbell-Kelly & Garcia-Swartz, 2009; Dorn, 2000).[2]

That software was an essential component of customer support for hardware manufacturers was especially true in the case of smaller companies who could not afford in-house programmers (Campbell-Kelly, 2003, p. 98; Haigh, 2002, p. 7). In the 1960s, mainframe producers developed software packages across all industries to which they sold, with IBM developing for all application types, and competitors usually focusing on specific areas of competence (Campbell-Kelly, 2003, p. 98).

This inchoate open-source approach, in which software would be provided to, or shared among, users without assertion of intellectual property rights or charging a fee was not without its drawbacks to IBM. The treatment of software as publicly available information without

[2] This did not mean the end of user groups, at least in name. As Dorn notes (2000, p. 1821), "[t]oday's user has almost no opportunity to affect the primary thrust of product developmental efforts; those lines are set by marketing requirements, competitive timings, and product life cycles." Still, "vendors recognize the value of even superficial cooperation as a marketing tool."

restrictions on access or sharing allowed competitors to differentiate their hardware, especially from IBM, while at the same time preventing severe technological lock-ins. Honeywell's 200 series computers (announced in late 1963), for example, were made compatible with IBM 1401 software so that migration to the Honeywell platform was cheap and easy. As Campbell-Kelly (2003, p. 98) writes, "Honeywell even supplied a provocatively named 'Liberator' program, which was the basis of an entire advertising campaign…. This was possible only because IBM's program packages were supplied free of charge, with no intellectual property protection." Moreover, open access to IBM's source code meant that independent software providers (ISVs) could potentially create software which competed with IBM's own software and/or strengthened through network effects the platforms of competitors like Honeywell (Campbell-Kelly & Garcia-Swartz, 2009).

For these and a number of other reasons the industry began to move away from the open-source model in the 1960s and 70s. The pivotal event in this regard is usually considered to be IBM's announcement in December 1968 that it would price its software separately from its hardware. The treatment of software as a discrete vendible product will be the subject of the next section. Before this, however, it is worth pausing to consider the analytical relevance of the industry's treatment of software technologies in the 1950s and 60s – that is, prior to 'unbundling'.

The production and use of software prior to its 'productization' exhibits a number of interesting points as regards the concept of the joint stock of knowledge laid out in previous chapters. Because this technology was not yet treated as a business asset in its own right its development, production, distribution, and use were dictated by the relationships between the engineers and the users of the hardware technologies. These relationships did not come

naturally, but rather as a result of deliberate efforts to collaborate across organizations, as in the case of the SHARE user group (Armer, 1956). The resulting artifacts – the code of the systems and application programs – was collaboratively produced and distributed among the members, generally without competitive maneuvering for advantage in business.[3] The result was a common "perception of software as a free good,"

> Walter Bauer, president of Informatics, recalled of the early SHARE meetings that 'everybody who developed a piece of software was only too happy and flattered to have somebody else use it.' This perception was a brake on the development of software products as a traded good until 1970, when IBM itself began to sell packages." (Campbell-Kelly, 2003, p. 96)

The history of SHARE also suggests that the relationship between the providers of computers and their customers, the users, was both necessarily more closely connected than arms-length contracting would permit and reciprocal in its direction of future technological developments. Indeed, Akera (2001) has argued that SHARE afforded a space in which programmers could assert their expertise, effectively maintaining a position of discretion among users of the technology along with the developers. SHARE's role as technical intermediary thus established a reciprocal technological relationship between IBM and its customers, with users producing a programming library that, as a vendible product, may have been worth millions, as well as influencing future hardware designs (Akera, 2001).

It is appropriate to note that this ability to assert an expertise and to create a professional identity among programmers existed in the context of a very open labor market for programmers as well as the esoteric knowledge held among these workers (Akera, 2001). It is argued here that this situation illustrates well the concepts of the joint stock of knowledge and the going plant as a

[3] Indeed, SHARE met with some legal concerns as to whether the group would raise antitrust scrutiny. These issues were avoided by maintaining a strictly technical and educational nature to the collaboration (Akera, 2001).

two-way relationship between the industrial interests of the producing and purchasing organizations. In this case, the going plant relationships that concerned the computer (hardware) platforms are found to have been embedded in the broader joint stock of knowledge, the latter including the software necessary to make the hardware serviceable. This, of course, should not be taken to wholly exemplify all inter-firm relationships, though it is clear that these generic features – technological processes being actively maintained and augmented by those with the requisite knowledge to do so, and going plant relationships defining users and providers of some discreet technology – will be found in any circumstance in which firms are involved.

Software was not, in this era, commonly treated as a vendible product, or 'captured knowledge' to be used to create profitable transactions. That is, the technology had not yet to be encapsulated by going plant and going business relationships. Because of this, the augmentation of the joint stock of knowledge proceeded in accordance with the mutual needs of the creators and users of the technologies.

Software as a Salable Product

The earliest software projects did not see the technical artifacts as business assets. This is to say, in terms of the going concern model, that the development of competencies within firms and the expansion of the joint stock of knowledge were carried on with industrial interests in mind, rather than the creation of differential advantages. The industry would, however, diverge from this framework in a number of ways, culminating ultimately in the rise of the software products market in the 1980s. In the examples discussed in the present section firms producing software came to treat discrete artifacts of the joint stock of knowledge – i.e. the code for computer software – as business assets as understood through the lens of the going concern

model. Going plants were thus created to encapsulate these technologies for the purposes of creating profitable transactions.

Software contracting in the 1960s exemplifies such a business approach to software. These programming services firms developed in the mid-1950s to provide custom programs to run on the expensive mainframes of the time. Firms would typically focus on one or more 'application domains.' The knowledge created in the process was then "effectively captured by software tools and code assets that could be endlessly redeployed for different clients," (Campbell-Kelly, 2003, p. 71).

Thus, in the case of the programming services firms, some software which could be generically applied across organizations was held as captured knowledge for the purposes of generating profits to the firm. This followed from the nature of the service these firms provided:

> In most cases, the development of these software assets was simply a rationalization of the software production process. Rather than build a piece of software from the ground up for each new contract, the firm began with a program that had been developed for a similar application and tailored it to the new one. (Campbell-Kelly, 2003, p. 71)

In this manner these firms came to more closely resemble the business enterprise modeled in chapters three and four, specifically as it concerned the first and second degrees of separation. The strategies of these companies as they concern the firms' relation to the evolving computer technologies provide one example. As Campbell-Kelly (2003, pp. 66-67) discusses, these companies typically focused on enhancing the their reputation through organizing conferences, engaging in industry punditry, and generating praise for their 'star programmers'. Understood through the lens of the going concern model, these companies competed both by developing competencies perceived to be valuable to users as well as by manipulating these perceptions themselves.

Software contractors were chiefly in the business of providing custom software, not in the sale of a generic software product (Haigh, 2002). IBM's unbundling decision, on the other hand, was an important precursory move to sell software itself as a product, rather than as part of a service. IBM first explored potentially unbundling its software services from its hardware sales in 1964. The impetus came from RCA's announcement that its Spectra 70 series would be compatible with IBM's System/360 line of computers. From IBM's perspective, RCA was attempting to free-ride on IBM's investment in developing the S/360. The concern, then, was that Spectra 70 users could freely use IBM's software, and that charging these users for use of their software would require also charging IBM's own users. Spectra compatibility with S/360, however, turned out to be limited, reducing the urgency of unbundling until a few years later, when IBM's competitors and independent software providers began to call for antitrust litigation (Campbell-Kelly & Garcia-Swartz, 2009).

In December of 1968 IBM announced its intentions to separately price its services including engineering, programming, and training. However, it would not be for another decade that the company would assert intellectual property rights over its software, including importantly its operating system. Moreover, IBM, as well as the other large computer manufacturers, would not market their software aggressively until the late 1970s (Campbell-Kelly, 2003, p. 174). The reasons for this are clear: these services continued to be viewed not as vendible products in their own right, but as an essential component to IBM's marketing strategy for its hardware. Aware that, as its customer base expanded, it would not be able to provide effective programming services for its customers, IBM encouraged users of its hardware and independent software vendors (ISVs) alike to provide these services for a technological platform over which it would retain control. Ferguson and Morris explain the strategy clearly:

> The secret of IBM's dominance, as IBM itself understood better than anyone, was that it had created, and owned, a pervasive industry architecture. All the competitors were playing by IBM's rules—making devices, writing software, manufacturing clones, running time-share centers—all within a computing environment that IBM defined and that only IBM had completely mastered. The confidence of IBM customers was so great, their commitment to the 360/370 architecture so deep, that no competitor had a chance of replacing it. It would mean throwing out too much investment built up over too long a time… The consequence was that no one could beat IBM to market with a new product line. If a competitor tried to invade its space ahead of IBM, it could never be sure that IBM's next operating system releases would be compatible with its product, especially if the product was one IBM wanted for itself. Competitors had no choice but to reverse-engineer IBM products only after they became available, and therefore were condemned always to be second to market. And by the time competitive plug-compatible products became available, IBM was usually already moving on to the next product generation. (quoted in Band & Katoh, 1995, pp. 23-24)

IBM possessed a *de facto* industry standard which it maintained by encouraging users to lock in to this architecture and ISVs to tap in to the growing pool of users in a virtuous cycle (Band & Katoh, 1995, p. 21). For these purposes it was unnecessary to 'capture', e.g., the source code of the operating system by refusing to grant access. In fact, this would have stymied the input of the very programmers that made IBM's architecture the *de facto* standard. All that was necessary, rather, was for IBM to maintain control of the future direction of the platform itself, ensuring that any potential competitors would always be playing catch-up. In this manner, IBM realized a substantial degree of intangible property which would most appropriately be classed as goodwill in the broad sense used by Commons (1961 [1934]), if not also in the more narrow sense used by accountants.

The maintenance of this sort of control on the part of IBM – which would fall under what Bartkus (1976) termed 'monopolizing innovation' – did not go without protest. *Telex v. IBM* (1973, 1975) concerned antitrust allegations against IBM from a plug compatible manufacturer (PCM), Telex, which created 'equivalent' peripheral components (e.g. disk drives) to IBM's for

the latter's System 370 computer. PCM products were often technically superior because they were developed after IBM's. In the late 1960s, IBM came to recognize that competition from these PCMs was beginning to undermine its market share for various components and responded through new product, price, and leasing agreement strategies.

Telex sued IMB for monopolizing the markets for these peripherals. The district court (1973) found in favor of Telex. Among the court's findings was evidence that IBM had intentionally introduced peripheral products whose design and price were intended to contain competition from PCMs. Equitable relief included mandates to prevent predatory pricing and physical tying, as well as disclosure of interface specifications in limited circumstances.

The appellate court (1975), however, reversed the district court's ruling against IBM, finding, among other things, that the relevant market was not restricted to peripherals for IBM's systems. Rather, the market was to be defined for peripherals across all potential systems for which Telex could adapt their products. The fact of competition among the system manufacturers, then, suggested that IBM did not have monopoly power over the components of its system considered separately – users and PCMs alike had a choice between systems, and there was therefore no monopoly. The public policy implications of business strategy concerning technological platforms will be returned to in the next chapter, after reviewing similar developments in the industry occurring in the 1980s and 90s.

Beginning with its 1978 decision to assert copyright over its operating systems, and culminating with its 1983 'object code only' (OCO) policy, IBM gradually restricted access to the source code for its software to users, competitors, and ISVs alike.[4] In doing so, IBM was

[4] In fact, IBM was among the last to deny access to the source code for its software (Campbell-Kelly, 2008), recognizing even at the announcement of the OCO policy that "the transition

"following the general trend of the independent software industry," recognizing software as "valuable IP [intellectual property] that needed to be protected," (Campbell-Kelly & Garcia-Swartz, 2009, pp. 237-238). More specifically, however, the move was a response to Japanese clones of IBM mainframes, leading IBM to "cut its hardware prices drastically, causing a recession in the computer industry and precipitating a general restructuring to secure more revenues from software and services," (Campbell-Kelly, 2003, p. 174). The clear effect, in any case, was to assert control over potential competition through restriction of access to knowledge. In addition to ceasing distribution of source code, IBM's OCO policy,

> added a host of new restrictions to its program license agreements, including (a) creation of a new category of 'restricted materials,' including logic manuals, microfiches, and source code; (b) prohibitions on disassembly of object code; and (c) new prohibitions on use of programming material. At the same time, IBM drastically scaled down the amount of technical information contained in its publicly available manuals. (Band & Katoh, 1995, p. 25)

Because ISVs providing complementary software products to IBM's platform would no longer have access to the source code necessary to make their software interoperate correctly, an alternative technological solution was needed: the applications programming interfaces (APIs) which allow programmers to write software that will interoperate with IBM's operating system without requiring that the programmers see the source code for the operating system. This became a point of contention with ISVs who recognized that this put them at the mercy of the APIs' design. (see Campbell-Kelly & Garcia-Swartz, 2009 on software industry trade association ADAPSO's negotiations with IBM). The practice likely also aided IBM's new policy of bundling software packages that worked well together (Campbell-Kelly, 2003, p. 177).

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would take at least 10 years, with some products never becoming fully OCO," (*Computerworld*, 1988, p. 62; see Campbell-Kelly & Garcia-Swartz, 2009).

Proprietary Software as a Conception of Control

While the large hardware manufacturers were turning to software to compensate for lagging hardware sales, by the 1980s software products produced by ISVs had become the dominant approach to production and sale of software technologies. These products included enterprise software, the production of which began in the mid-1960s and accelerated after IBM's unbundling, as well as mass-market or 'shrink-wrapped' software, taking off in the late 1970s with products such as VisiCalc and WordStar (Campbell-Kelly, 2003, pp. 6-7). Among these software vendors, and joined by the hardware manufacturers by the 1980s, the dominant conception of control was defined by the business model for proprietary software.

Proprietary software involves the clear definition of the participants' roles in the processes of creating, using, and augmenting software technologies in terms of (1) discretion in these processes, and (2) access to the resulting knowledge. Distribution of object code only – i.e. keeping the source code private – constituted a simple and effective technological solution to controlling access to the joint stock of knowledge. The boundaries of organizations – most importantly between the software vendor's engineers and the users – were delineated in this manner, and the software vendor thereby established a going plant encapsulating its software technology. As a further effect, the software vendor retained control of the augmentation of the joint stock of knowledge embodied in the code.

The user, however, did not lose all discretion in the going plant. In order for a firm to establish a differential advantage by controlling access to the joint stock of knowledge, that knowledge must be valued in use to someone. In the software industry this dictated that vendors not simply produce and distribute their product, but also support its use. This was especially the case with enterprise software. Vendors of these software products, per Campbell-Kelly (2003, p.

6), developed critical capabilities which included both quality assurance and customer support in the form of customization, user training, and upgrades. Just as IBM had to establish APIs to allow ISVs to continue to program for its closed operating system, these capabilities suggest that participants in the industry were reconciling relationships defined by access to the relevant knowledge with the requirements for production and use of the technology. The same technological requirements made 'ease of use' a central concern for the vendors of mass-market software (Campbell-Kelly, 2003, pp. 7-8).

The issue was one of stabilizing the conflict between controlling access to the joint stock of knowledge, on the one hand, and facilitating the relationships between engineers on the producing and using sides of the going plant on the other. Without the former the software vendor could not generate profitable transactions and thus maintain itself as a going concern; without the latter the technology would not be valuable in the first place. It was this issue that defined the accepted method of distribution. There were three potential models for charging customers: the software could be sold outright, giving the user absolute ownership; it could be licensed; or access could be granted and charged for on a per-use basis. As Campbell-Kelly (2003, p. 31) explains, "[m]ost often the middle course of a perpetual but revocable license was favored by software vendors because it represented the best compromise between recovery of development costs and control of the product's use."

Legal Sanctioning of the Proprietary Model

If the norms of proprietary software had become the dominant conception of control by the 1980s it is worth recalling Fligstein's (1996, p. 658) argument that the "state must ratify, help create, or at the very least, not oppose," this conception. An analysis of the legal sanctioning of these industry norms is thus pertinent.

As Campbell-Kelly explains,

> It was a commonplace in the software industry that programs were trivially easy to replicate. This had never been a practical problem; custom programs were generally too specific to an organization to be attractive to another user, and manufacturers' software packages were free. However, with software generally perceived as a free good, legal and/or physical protection of programs was important for the software products industry. (2003, p. 107)

The issue of 'protecting' software from unauthorized distribution – sharing – had been of concern in the industry since the 1960s; but it was not crucial, for the reasons just noted, until firms had come to treat software as itself a salable product. The industry initially turned to patents to win legal sanctioning of the differential advantages created by their software. However, the patent system carried with it a number of disadvantages, including a review process involving significant time and expense and disclosure of the source code to the public.[5] Beyond this, issues persisted in applying patent law to this new technology for which the law had not yet been developed. For instance, it was not clear that most code could pass the non-obviousness and novelty requirements of patents (Band & Katoh, 1995; Campbell-Kelly, 2003). In fact, between 1972 and 1981,[6] standing Supreme Court precedent held explicitly that software was not patentable subject matter.

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[5] Requiring registration of the source code at the Library of Congress likewise made Congress' 1964 extension of copyright to cover software unsuitable to firms who feared competitors could easily replicate the functional characteristics of the program without copying the code verbatim (Campbell-Kelly, 2003, p. 107). Making the source code available for public inspection would likewise have voided its trade secret status (Samuelson, 1993, p. 286).

[6] In Gottschalk v. Benson (1972) the Supreme Court held that programs were not patentable subject matter, because patents do not cover scientific truths, mathematical expressions, or algorithms. This was in line with the views of the US Patent and Trademark Office laid out in the 1960s. The ruling was reversed in Diamond v. Diehr (1981). Since then a complex precedent has developed attempting to define what exactly constitutes the statutory subject matter of patents (Band & Katoh, 2011, pp. 186-187; Samuelson, 1993).

In the absence of suitable intellectual property protection firms seeking to control access to their software defaulted to trade secret law, requiring non-disclosure agreements of their employees and customers alike. Distributing software products by perpetual license allowed for an additional level of enforcement: licenses could be revoked if customers were found to have made unauthorized copies (Campbell-Kelly, 2003, p. 108; Samuelson, 1993). This continued to be the dominant mode of protection through the 1970s (Samuelson, 1993) though it entailed one particular shortcoming: trade secrecy was generally understood not to prevent others from reverse engineering legitimately obtained source or object code and replicating the functional aspects of the software (Band & Katoh, 1995, pp. 80-81; Samuelson, 1990). Regardless of the efficacy of trade secrets for protecting knowledge assets in software, the general sentiment within the industry was that more protection was needed (Samuelson, 1993).

Congress would ultimately decide the legal framework for the protection of software as intellectual property (Band & Katoh, 1995). In 1974 Congress commissioned the National Commission on New Technical Uses of Copyrighted Works (CONTU). Giving its final report in 1979, the commission noted in its majority opinion the increasing importance of intellectual property protection over software as a result of the proliferation of historically inexpensive, yet powerful computers for which programs involving less customization while remaining relatively easy to duplicate without authorization were written. Given this the majority opinion recommended that the Copyright Act of 1976 be amended to explicitly extend protection over the written expression, but not the processes or methods, embodied in software, which would be recognized even in the absence of registration at the Library of Congress (Band & Katoh, 1995).

In his dissenting opinion, CONTU Commissioner John Harvey argued that this would "mark the first time copyright had ever covered a means of communication, not with the human

mind and senses, but with machines," (quoted in Band & Katoh, 1995, p. 75). Dissent notwithstanding, Congress followed the recommendations of the majority opinion, incorporating computer programs into the 1976 act with the Computer Software Protection Act of 1980. Litigation in subsequent years found object code, operating systems, and firmware to be among the many varieties of computer code copyrightable under the 1980 act (Band & Katoh, 1995, pp. 71-77).

Consistent with Fligstein's (1996) analysis, it is seen that the state did indeed play a significant role in creating the legal framework in which the software industry, guided by the business model of proprietary software, would operate and grow. Here, as elsewhere, the issue was one of allowing firms to control specific aspects of the joint stock of knowledge. Because this knowledge could not be fully captured in physical artifacts of the industrial process, intellectual property rights were asserted. Most notable, Congress deliberately created legal space for software as copyrightable subject matter. Though copyright was ultimately found not to protect against reverse engineering for commercial purposes (see, e.g., Band & Katoh, 1995, 2011; Lipton, 2006), it served the essential functions of allowing for a legal remedy for unauthorized copying without the need for a cumbersome review process or disclosure of the source code. Copyright was, of course, not the exclusive form of protecting the knowledge assets of software vendors. Following the 1981 decision of Diamond v. Diehr, the Supreme Court reestablished software as patentable subject matter. Trade secret, likewise, remained a viable and common form of legal protection as well (see Band & Katoh, 1995 for further discussion).

Two important reactions can be seen to the shift from software as a free good to a vendible product. First, the norms of the going plant, specifically in terms of the relationships

between users and producers, were developed in the process of establishing discrete organizational boundaries defining access to the joint stock of knowledge embodied most importantly in source code. Second, the proprietary software conception of control created competitive opportunities within the industry that showed strict proprietary norms to be inherently unstable. The first of these issues will be discussed in the next section; the second will be reserved for the following chapter.

Implications of Proprietary Software for the Joint Stock of Knowledge

Programming at MIT's Artificial Intelligence Labs at the time, Richard Stallman[7] would describe his first encounter with non-disclosure agreements as a betrayal of the 'share-and-share-alike' norm of 'hacker culture' (Williams 2002 p. 6-7). "[I]t immediately taught me that nondisclosure agreements have victims.... In this case I was the victim. [My lab and I] were victims," (quoted in Williams 2002 p. 11).[8] The perception of software, embodied in source code as a vendible product was antithetical to the governing norms of the engineers responsible for maintaining and improving this stock of knowledge. Because of this, the movement toward the proprietary software conception of control entailed changing, or at least subduing, these norms. In terms of the present model, in establishing the going plant and imposing a business discretion over the same, it was necessary that the extant norms of the technological relations

[7] Stallman would go on to found the Free Software Foundation and create the GNU General Public License, both of which have been central to the free/libre open source software movement (Williams, 2002).

[8] Stallman was, indeed, not the first to suffer the loss of restrictions on technology-centered relationships that non-disclosure agreements entail. Fisk (2009) documents in detail the evolution of business organizational practices and its concomitant legal developments by which the business enterprise came increasingly to control the intellectual output of its workers. The explicit non-disclosure agreement was only one means by which this transition was effected in the late nineteenth through early twentieth centuries.

involved be reformed or supplanted. The boundaries of organizations – a central question in most theories of the firm – are defined in this manner.

In order to allow the industrial processes of software development and use to continue despite these new restrictions on access to the knowledge necessary therefor, the industry had to develop methods for facilitating transactions across the newly defined boundaries of access. As was discussed above, distribution of object code, without source code, through licensing agreements came to form the basic solution to the problem. This system allowed software vendors to capture a portion of the joint stock of knowledge embodied in the source code and to grant access only when a satisfactory price was forthcoming. The state facilitated this process by establishing explicitly a legal framework in the realm of intellectual property rights.

While the property and contract methods of proprietary software business are commonly understood, these were not the only adjustments necessary to make software technologies vendible products. As noted above, customer support in enterprise software and emphasis on 'ease of use' in mass-market software were found to be crucial to successful software firms. Application programming interfaces, likewise, were developed to allow programmers of complementary software for operating systems to continue to augment industrial knowledge without having the unlimited access to relevant information that they enjoyed when source code was freely distributed (cf. Young, 1999).

In all of these cases, the nature of relations between existing organizations concerning technical processes were changed to allow for differential advantages to be established in terms of these relations. Veblen's case that 'invention is the mother of necessity' (1914) proves acute. The development of reusable instructions for computing machines was eventually recognized by business as a potentially profitable activity, changing the nature of industrial relations. Indeed,

the method of controlling access by distributing only the object code may in fact be traceable to the expedient developed by IBM to accelerate program processing: IBM distributed both the source code of its early software, with one instruction per card, as well as the binary code, which at ten lines per card would process much faster (Campbell-Kelly & Garcia-Swartz, 2009).

Moreover, the technical processes themselves were augmented to conform to the new conception of control. Much as the move to routinized labor under the factory system was made in part because it fit with the existing hierarchy of employer and employee (Marglin, 1996 [1974]), a transfer of technical expertise from the user to the vendor is seen in the historical development of software as a vendible product. This was assured, no doubt, by the removal of discretion from the user in changes made to the source code.

The Unix Operating System

To be clear, it is the treatment of technological processes as business assets which mark the organization of economic activity in accordance with the modern business enterprise as described by the going concern model. The development of the Unix operating system, the result of a unique set of commercial circumstances, offers a clear illustration of the basic processes under discussion. Unix is an operating system developed initially by Ken Thompson and Dennis Ritchie at Bell Labs in 1969. This software offers an interesting case study precisely because its legal definition as a business asset has historically varied from its technical treatment by its developers and users. The reason for this is clear: because AT&T, co-owner of Bell Labs, was a regulated monopoly forbidden from entering the computer industry on commercial grounds until 1984, Unix was treated much as IBM's systems applications had been treated prior to unbundling. That is, Unix was not treated by AT&T as a product to be sold for a profit. This

is not to say, however, that AT&T did not see its software as a business asset that could be exploited in the future.

Unix has been called 'non-proprietary' software in the past. Kelty (2008) disagrees with the appellation. Unix was always subject to claims of copyright; because of AT&T's regulatory status, however, the operating system was generously licensed and distributed with its source code on conditions such that trade secrecy would be maintained. The result was an incredible proliferation of Unix, with users maintaining and improving the source code despite very little support from AT&T. Much as with IBM in the 1950s, a user group, USENIX, soon formed. Kelty (2008, p. 128) indicates the nature of the technological concern that Unix had come to constitute:

> In many ways, academics found it just as appealing, if not more, to be involved in the creation and improvement of a cutting-edge system by licensing and porting the software themselves, rather than by having it provided to them, without the source code, by a company. Peter Salus, for instance, suggests that people experienced the lack of support from Bell Labs as a kind of spur to develop and share their own fixes.

This system allowed Unix to maintain conceptual integrity without becoming outdated – Unix was still Unix twenty years later and it was still cutting-edge (Kelty, 2008, pp. 128-129).

Again, this is not to suggest that AT&T did not see Unix as a potential business asset. The firm's interest in this regard, however, was largely relegated to maintaining trade secrecy. This created a problem for AT&T's lawyers, as widespread dissemination of the source code, along with updates written by programmers outside of Bell Labs, complicated the licensing process, made the source code's status as a trade secret uncertain, and "scrambled the legal clarity," of the technology, "even while it strengthened the technical quality," (Kelty, 2008, p. 130). As with cases given above, the task for the business employments responsible for managing the property rights aspects of Unix – specifically licensing – was to "find a balance

between allowing this circulation and innovation to continue, and attempting to maintain trade secret status for the software," (Kelty, 2008, p. 129; cf. Lehey, 2003 on the many definitions of "Unix").

Thus, even though Unix was not treated as a salable product by AT&T, the basic treatment of the technology as a business asset created a tension between the property interests and the technological interests within the firm. Kelty (2008, p. 131) explains:

> For the lawyers, stability implied finding ways to make Unix look like a product that would meet the existing legal framework…; the ownership of bits and pieces, ideas and contributions had to be strictly accountable. For the programmers, stability came through sharing all innovations with all users so that new innovations might also be portable. The lawyers saw urgency in making Unix legally stable; the engineers saw urgency in making Unix technically stable and compatible with itself, that is, to prevent forking[9] of Unix, the death knell for portability.

The case of Unix suggests that the processes of organizing industrial relations toward the creation of differential advantages between producer and customer do not in fact even require that the technologies concerned be treated as vendible products. They need only be treated as business assets – i.e. knowledge, the access to which has, or may someday have, value to others who would be willing and able to pay. This, again, is the crux of the first and second degrees of separation, in which a delineation of purchasing users and selling producers is made and the distinct interests of the going business come to dominate those of the going plant.

Though this era of the industry will be explored further in the next chapter, a few words are in order regarding the evolution of Unix in the 1980s and 90s. Even prior to the 1984 consent decree which allowed AT&T to commercialize its computer technologies, the company had begun to transition to the development of Unix not for technical stability but for commercial

[9] Forking "generally refers to the creation of new, modified source code from an original base of source code, resulting in two distinct programs with the same parent," (Kelty, 2008, p. 136).

stability as a vendible product (McKusick, 1999). By the early 1980s, AT&T had a commercial Unix, the System III, then System V, and licensing fees began to rise from a nominal $99 to hundreds of thousands of dollars (Leonard, 2000). Meanwhile, faculty and students at the University of California, Berkeley, who had substantially expanded on AT&T's code, creating the Berkeley Software Distribution of Unix (BSD), took over Bell Labs' role in coordinating development through the already-established and far-reaching network of Unix programmers.

Throughout the 1980s and 90s, Unix vendors proliferated. By 1999 Young counted 30, "largely incompatible, versions," of the operating system. This was the case despite efforts to unify among the major vendors, which ultimately failed (see Southwick, 1999, pp. 74–9 on the Unix wars, and the next chapter for further discussion). The OS was likewise Balkanized despite AT&T's attempts to assert control through its intellectual property rights in the code base – notably in its suit against Berkeley (see McKusick, 1999).

In fact, the important outcomes of all of these were (1) the development of free, open-source versions which had technical roots in Unix, but none of AT&T's proprietary code – including FreeBSD and GNU/Linux (Lehey, 2003; McKusick, 1999); (2) the rise of Microsoft to supremacy in the OS market (Lehey, 2003; Southwick, 1999); and (3) the impetus for the open-systems movement (Kelty, 2008, pp. 140–1) which will be discussed in the next chapter.

The forking of Unix that resulted from its commercialization is a clear example of the inherent conflicts within the going plant. As these developments unfolded through the 1980s and 90s, the once relatively stable and unified technology was fragmented. Not coincidentally, the distribution of source code gradually slowed. Young (1999) describes the problem succinctly:

> suppliers have short-term marketing pressures to keep whatever innovations they make to the OS to themselves for the benefit of their customers exclusively. Over time these "proprietary innovations" to each

> version of the Unix OS cause the various Unixes to differ substantially from each other.

On comparison with the free/libre open source software (F/LOSS) projects such as Linux – which typically involve free access to source code and licensing agreements which maintain this access, as well as the terms of the license, to future developments – it is clear that the commercialization of Unix within the proprietary software framework is the cause of this fragmentation. As Young (1999, unpaginated) further explains, the pressures that Linux faces are precisely the opposite of those of proprietary software: "If one Linux supplier adopts an innovation that becomes popular in the market, the other Linux vendors will immediately adopt that innovation. This is because they have access to the source code...and it comes under a license that allows them to use it."

Conclusion

Computer software developed from its earliest roots as both a technological and cultural process characterized by the free distribution of information and more generally by reciprocal relations between engineers. Under these circumstances the technology was not treated as a business asset from which to derive profitable transactions directly. In the process of creating vendible products from these processes the technological and cultural norms that conflicted with the basic methods of business – creating and capturing value – were altered or replaced. Hence, by the 1980s software technology came to be managed by the going businesses under the conception of control defined by proprietary software. As Williams (2002 pp. 99-100) puts it, "[s]oftware, once a form of garnish most hardware companies gave away to make their expensive computer systems more flavorful, was quickly becoming the main dish. In their increasing hunger for new games and features, users were putting aside the traditional demand to review the recipe after every meal."

The transformation by which technological processes within the going plant become business assets necessarily entails a loss of discretion among the members of the going plant – here generically called the engineers. It also typically necessitates an organization of the going plant, such that vending engineers (producers) are clearly separated from purchasing engineers (users) for the purposes of creating monetary transactions out of the interaction of the two. The boundaries of firms, again, are drawn according to this process through the strategic manipulation of property relations, tangible and intangible.

However, because the establishment of profitable transactions through control of knowledge is likely to hinder needed interactions between these now-separated industrial employments, new relationships may be in order. The firm may take to establishing customer support services, for instance. Thus, while the property boundaries of firms are drawn in the interests of business, the interests of the going plant cannot be completely thwarted without jeopardizing the foundation on which profitable transactions are built. The technical boundaries are thus drawn, and redrawn, in an effort to stabilize the industrial and business relationships involved and to facilitate the survival and growth of the business enterprise.

The foregoing illustrations have been given for the purposes of exploring the concepts, arguments, and implications of the going concern model for the analysis of actual industries in terms of the essential characteristics of the hierarchies of relationship between and within firms. The proprietary software conception of control, managed through patents, trade secrets, copyrights, object code and licenses, provides a simple illustration of relatively stable relationships between business and industrial employments vis-à-vis the joint stock of knowledge. However, it will be argued in the next chapter, as was suggested by the history of Unix above, that certain aspects of the technologies at hand make the simple proprietary model

potentially unstable. This in turn leads to further opportunities to understand the nature of the going concern model, particularly in terms of how the interaction of industrial and pecuniary employments can affect the manner in which these technologies are changed over time.

CHAPTER 6

OPEN SYSTEMS AND INTELLECTUAL PROPERTY: THE EVOLUTION OF MARKET GOVERNANCE MECHANISMS

As discussed in the previous chapter, the computer industry rationalized business interests in the technological processes of software production and use initially through proprietary software. This provided an effective means of denying access to needed parts of the joint stock of knowledge unless compensation was forthcoming. The proprietary conception of control thus became common in the industry by the 1980s, being formally sanctioned by the explicit recognition of intellectual property rights over software, with copyright as the legislatively chosen form. As previously noted, however, this model was not entirely stable; a tension was present where ever a market could be developed without a need for the particular technologies already under the control of proprietary firms. In the 1980s this tension came to be recognized as producing potential competitive opportunities, culminating in the open systems movement.

Open systems was a conceptual framework promoted by businesses like Sun Microsystems that advocated for the establishment of interoperable hardware and software components provided by disparate vendors. As Fligstein (2001, pp. 223–8) has argued,

> 'openness' evolved when the attempt to create proprietary systems failed. If firms could not control technology markets through patents, then the second best solution was to get their product to be an industry standard. Doing so creates stability because it allows industry leaders to form and markets to coalesce around stable standards.

Open systems, in other words, created new forms of differential advantage that were in some cases found to be superior from a business perspective. The present chapter will analyze the open systems movement chiefly through the history of Sun Microsystems, a small startup in the

workstation market in the early 1980s which experienced 'hypergrowth' (Hall & Barry, 1991) through much of the 1980s and 90s as the industry flag bearer for open systems. Sun has been chosen because of its leading role in this movement and because its founders, executives, and engineers were often vocal within the industry. Hall and Barry (1991, p. 239) explained the importance of Sun even at a relatively early date:

> As the computer industry's major proponent of open technology, it has changed the way computer makers develop, build, market, and sell their wares. Sun forced the computer industry to wake up to the information-processing needs of users. Sun dragged its competitors into the real world, in which users live with the frustration of having millions of dollars' worth of incompatible equipment. It forced vendors to offer, at least as an option, standard technologies. Sun made open systems profitable, for both the vendors and users. That is the company's vital legacy—Sun tapped into the future of technology and made it turn a buck.

Sun exhibits an interesting dynamic between engineering and business, and as such provides an interesting case with which to understand the relationship of the going plant and the going business in the computer industry. Along these lines, the present chapter will discuss the open systems movement seen as a divergence from the proprietary software model.

Beyond the theoretical implications of the open systems movement as a business strategy, the present chapter will also analyze the legal developments concomitant to this movement – developments in which Sun often played an important, if indirect, role through *amicus* briefs and the like. It will be seen that the evolution of copyright law as it pertains to interoperable software and hardware fell along roughly the same lines as the conflict between the proprietary and open conceptions of control within the industry: dominant proprietary businesses, or 'ultraprotectionists' as Band and Katoh (1995) have called them, sought to maintain near-absolute rights of exclusion over their 'intellectual property', including the right to control the interaction of their technologies with other technologies. Copyright in computer software, to this group,

would operate much as a patent, excluding all others from any unauthorized use of the product or process.

The open systems advocates on the other hand argued for limited copyright privileges, especially in the interfaces required for technologies to interoperate. As discussed in greater detail below, the business model of these firms was to give, free of charge, the idea encompassed in the standards necessary for interoperability while selling the implementation of the standard. The corresponding formulation of copyright law, found in the precedent of this body of law prior to its application to software, was to protect the *expression* of software, but not the *idea*.

As previously discussed (chapter four), the modern business enterprise exists in the separation of processes of consumption and production, relegating the discretion of users to purchasing, in the interest of creating profitable transactions over time. Under normal conditions the business enterprise can expand these transactions, in volume or price, through the manipulation of users' perceived need for access to the knowledge which the firm controls. The business problem is to manage the growth of and access to the relevant technological knowledge. Under conditions of technological change and competition, this means maintaining a hold on a valuable part of the going plant relationships concerned without completely stifling the problem-solving processes therein and thereby destroying value to the user. The conflict between open and proprietary systems described below shows an industry grappling with the question of which forms of market governance can best solve this problem for the businesses involved. The inevitable result in any case is the manipulation and contortion of the boundaries of the going plant in the interests of profitable transactions; the boundaries of the firms themselves then come to reflect this process of gerrymandering sociotechnological relationships.

Here we seek to make clear that the competitive processes of the software industry under either form of governance have ceremonial characteristics as defined in chapter two in limiting the growth of the joint stock of knowledge, and in depriving society of the contributions that could be had were access to that stock unimpeded. As noted in the previous chapter, these characteristics were in fact already institutionalized in the movement toward (1) corporate ownership of workers' intellectual products, (2) the legal protection of software by various forms of intellectual property, and (3) the technological 'protection' of software through withholding the source code and other means. The movements in conflicting forms of market governance described in this chapter, therefore, speak to the industry's attempt to provide for stability of business; as elsewhere, the instrumental interests of individuals and the community at large are served only incidentally.

The Open Systems Movement and Sun Microsystems

Sun Microsystems was founded in February, 1982. Though not all there at the very start, the four co-founders were Vinod Khosla and Scott McNealy, forming the business side, and Andy Bechtolsheim and Bill Joy, forming the engineering side (Hall & Barry, 1991, p. 26).[1] Sun formed originally to produce and sell workstations, powerful desktop computers used principally in engineering and scientific fields – a market which it would come to dominate over rivals such as Apollo Computer, Inc. and Hewlett-Packard Co. (HP) by the end of the decade. The company also adroitly expanded into numerous other markets in hardware, software, and networking. The present section provides a brief sketch of Sun's success with its open systems strategy in the

[1] See also Southwick (1999). The business side of Sun's cofounders was not, in fact, without technical training. Khosla held degrees in electrical engineering and biochemical engineering. McNealy had very little knowledge of computers, but was experienced in manufacturing operations.

1980s and 90s. This history is relevant to the theoretical explanation of this new conception of control which developed and, at least partially, supplanted the older, proprietary model.

As a small startup, Sun did not have the in-house resources or the time to develop from scratch the hardware and software needed for its first workstation, the Sun-1. Instead, it developed a 'standards-based' system built from components largely developed by outside vendors.[2] As Southwick (1999, p. 12) explains, "[t]he value added came in how Bechtolsheim put these chips together in the guts of the Sun workstation." The use of third-party components kept costs down as Sun would not have to recoup costs associated with in-house technology development. The result was a relatively powerful and adaptable, yet inexpensive workstation which quickly proved competitive (Southwick, 1999; Baldwin, 2010).

Crucial to building the Sun-1 was the operating system that would manage the workings of the hardware and the interaction of software and hardware. UNIX was the usual solution among engineering students like Bechtolsheim and Joy. However, typically "when prototypes turned into production models, UNIX was renounced in favor of specialized, proprietary operating systems, which in the early 1980s was considered the prudent approach to take," (Hall & Barry, 1991, p. 6). Sun, however, opted for the Berkeley Software Distribution (BSD) version of Unix, a distribution which Joy had been integral in developing while a graduate student at Berkeley (Leonard, 2000).

Sun's adoption of BSD UNIX for its Sun-1 and subsequent models was thus somewhat unique; it is a reflection of its early adherence to open systems which the company itself defined in terms of "standard interfaces free from the control of any one vendor," (Band & Katoh, 1995,

[2] Sun was not alone in this approach. In order to "sidestep the company's slow bureaucratic development processes," IBM outsourced much of the technological development for its PC (Campbell-Kelly, 2003, p. 206). See also Baldwin's (2010) discussion of Dell in the 1990s.

p. 33). A commitment to open systems quickly became the general sentiment among Sun's fast-proliferating engineering staff:

> To get the company's first Sun-1 workstations out the door, the fledgling company added other young engineers, many of whom clung to the antiestablishment, hacker attitudes they'd learned in college. These attitudes prepared the company to adopt an unconventional strategy for distributing technology devised at Sun. (Hall & Barry, 1991, p. 143; cf. Raymond, 1999) (Hall & Barry, 1991, p. 143)

Much like the cultures of the early user groups in the 1950s, Sun's open systems philosophy encouraged a relatively free interaction among the engineers and users of the organizations involved. As Band and Katoh (1995, p. 33) have noted, Sun's early success was due largely to the company's "willingness to make its architecture available to other vendors." Adopting UNIX made this much easier, but Sun's ties to third-party software and hardware vendors quickly came to involve more than the adoption of existing standards. These relationships involved, among other things, underwriting some of the costs of porting third-party products to Sun's workstations, publishing an extensive third-party catalog, and co-developing advertising materials (Hall & Barry, 1991, p. 188).

Moreover, because the workstation's typical user was a scientist or person of technical expertise otherwise, Sun developed a 'camaraderie with its customers,' who would not only promote Sun's products through word of mouth, but also offer crucial input into the future evolution of the technologies. This was not unique to Sun: "competitors Apollo, Digital Equipment, and Hewlett-Packard had all used it; Sun, however, would take it to the extreme, becoming a company of engineers selling to other engineers," (Southwick, 1999, p. 15).

Using standards kept Sun's development costs low, allowing it to maintain lower margins without sacrificing performance, and to acquire market share from competitors like Apollo through lower prices. Sun's first workstation, for instance, was priced at a third of Apollo's first

workstation, the DN100 (Hall & Barry, 1991, pp. 24–26). The strategy was to gain market share in the long-run at the expense of profits in the short term, or more precisely to "create an expanding market through standard systems and acquire the biggest possible share of it," (Hall & Barry, 1991, p. 170). Hall and Barry attribute this strategy to CEO Scott McNealy, whose father had been vice chairman of American Motors. McNealy's experience with his father's work impressed upon him the importance of market share (see also Southwick, 1999). Baldwin (2010) has described this particular form of business maneuvering vis-à-vis technological architectures as a creating a 'return on invested capital advantage'. In Sun's case, the strategy was particularly effective against Apollo as the latter's proprietary architecture made it costly to redesign in response to Sun's technological maneuvers.

Sun's approach to engineering and marketing in the workstation market proved successful. Apollo, which had effectively created the workstation and built the market, lost its dominant position to Sun by 1986. This occurred because Sun won recognition as the open systems choice, and maintained relatively powerful workstations while competing aggressively on price as well. The company's Sun-3, introduced in September of 1985, began the process of overtaking Apollo, which maintained proprietary software and did not compete on price. (The Sun-3 was actually both technically superior to and cheaper than Apollo's equipment (Hall & Barry, 1991, p. 71).) Sun, moreover, enjoyed an advantage in winning support from third party software such as AutoCad, while at the same time Apollo was hurt by downturns in the few third party re-sellers on which it depended for much of its revenues. Apollo was ultimately acquired, in 1989, by HP who was looking to recoup market share in the workstation market through purchase. Sun promptly took some of this market share in the transition period of the HP-Apollo

merger and returned to the number one position in the market by early 1990 (Hall & Barry, 1991).

The differential advantages vis-à-vis its competitors that Sun enjoyed in the workstation market are to be found in two sources of 'value' to the business enterprise: the value of non-proprietary systems to users and the value of 'being in the driver's seat' of the standardization processes that are all but inevitable and ubiquitous in the industry. In the first, it has been a generally recognized feature of the proprietary model that users become locked into the vendor's platform. The purchase of, e.g., a workstation or an operating system means limiting ones choices in components, e.g. application programs, that will work with those systems (see discussion in previous chapter).

It has been observed that, beyond simply constraints in future choice, captive users are subject to a particular form of planned obsolescence. Given the continual technological change involved in these technologies, firms strategically design and issue updates in order to maintain profitable transactions. An article in *The Economist* ("Idea," 2009) explains this in the context of software:

> New software is often carefully calculated to reduce the value to consumers of the previous version. This is achieved by making programs upwardly compatible only; in other words, the new versions can read all the files of the old versions, but not the other way round. (see also Forge, 2006; Katz & Shapiro, 1998)

Users are regularly faced with the possibility of degrading the value of one component in an owned system by upgrading another, as well as the potential to be left behind as other users make their own upgrades (Katz & Shapiro, 1998). The lock-in that users suffer allows the firm to manage the value of the technological processes it controls and to ensure that innovation is as profitable as possible. This is a direct result of the user-vendor relationship, the organization of the going plant, necessitated by the proprietary business model. In contrast, where users and

developers of software are not separated by property rights and the controlling interest of the latter in profitable transactions, as is primarily the case for instance in open source software projects, the potential for planned obsolescence is not there (see Nyman, Mikkonen, Lindman, & Fougere, 2011).

This is to suggest that the proprietary model threatened the continuity as well as the congruence of the going plant as defined by a given software project in the face of technological change. Fligstein (2001) has suggested that the market was unstable as a result. Open systems and standardization provided the necessary stability for firms to operate (see also Cargill, 2001). More accurately, the proprietary model threatened the going plant insofar as it was to remain organized for profitable transactions, requiring a clear organizational distinction between user and producer. Nyman et al. (2011) argue essentially this in regard to code forks, the splitting of software projects including users and developers, into separate camps.

The potential for these forks which is ever-present in open source software ensures that "any program which has the support of the open source community will enjoy assured relevance rather than planned obsolescence," (Nyman et al., 2011, p. 2). Where technology is controlled through intellectual property or other means, these forks are at the discretion of the vendors; users can only choose to remain locked in or leave the technology entirely, dissolving the going plant. Sun's open systems strategy, similarly, was touted as a rejection of the planned-obsolescence made possible by the proprietary model (though not, of course, of the general principles of business). Sun's VP Carol Bartz affirmed:

> We wouldn't hesitate to bring out a new product at a price and performance that absolutely destroyed an existing line. Why should we wait for the competition to do it? That is a brand new concept in this business and we have proved you can make money doing it. (quoted in Garud & Kumaraswamy, 1993, p. 360)

The starting point, then, for understanding Sun's early success in the workstation market is in recognizing that users were discontented with the proprietary systems of its competitors. Hall and Barry observe (1991, p. 24) that Sun "was the first workstation company to fully grasp that customers were serious about moving to standardized technologies, which enabled these customers to escape, in part, the 'planned obsolescence' built into proprietary systems." Users had in fact openly demanded industry standards, as, for instance, in the case of the 1985 AutoFact (for automated factory) trade show. There, large industrial firms such as General Motors and Boeing demanded "an end to 'islands' of manufacturing automation," (Hall & Barry, 1991, pp. 35–36).

But, Sun did not simply respond to the perceived desires of customers; it actively fostered a belief among technical users that open systems, as a philosophy, was "a great awakening in the computer industry." As a result, these users did not simply become customers of Sun, they became "part of the conspiracy to undermine proprietary technology," helping Sun "because they knew if Sun were successful, they'd have choices that went far beyond Sun Microsystems itself," (Hall & Barry, 1991, p. 204). The still-young workstation company made this 'great awakening' the center of its marketing. Where its competitors focused on the technical superiority of their computer architectures, typically built in-house and proprietary, Sun promoted,

> an operating system architecture that ran on a variety of platforms, three of which it offered...and others were widely available. Sun may have earned the lion's share of its revenues from shipping workstations, but it sold people on its software architecture. (Hall & Barry, 1991, pp. 30–31)

Sun's success in the workstation market, and the success of the open systems strategy in general, can further be credited to the advantage it gained by maintaining a guiding hand in the standards development process. In part, this ensured a revenue stream from widely-adopted technologies over which Sun could claim intellectual property rights. Hall and Barry (1991, pp.

146–7) note, "[c]ustomers could become 'locked' into standard systems as well as proprietary ones. They had more options, but these were not limitless." However, Sun typically licensed technologies built in-house on generous terms in order to encourage adoption, suggesting that its open systems strategy was not driven principally at licensing fees (cf. Garud & Kumaraswamy, 1993). Rather, the aim of the strategy was to put Sun in a dominant position in the standards-setting process, to create a reputation of expertise in the industry, and to sell workstations as implementations of those standards based on that reputation.

Sun's Network File System (NFS), released in 1984, provides an illustration from the firm's early days. This protocol was designed to allow users to access files over a network much as they would from a local hard drive. Rather than integrating the technology into their workstations and preventing access through trade secrecy, copyright, or patent, however, Sun licensed it and distributed the source code along with the object code. In fact, the company went as far as to post the specifications for NFS on a popular electronic bulletin board, Usenet, allowing anyone, including competitors, to develop NFS-compatible software without paying anything to Sun. The benefit was not lost to Sun however: "NFS was critical to the acceptance of Sun as a creator of something more than 'just another workstation system'... NFS gave Sun distinction among the gaggle of competitors," (Hall & Barry, 1991, pp. 148–150).

This approach became the mainstay of Sun's rapid growth throughout the 1980s. By the end of the decade Sun participated in all major standards-setting bodies (Hall & Barry, 1991, p. 142). Its partnership with AT&T in 1987, moreover, not only provided the company with the funds to grow and to remain independent from the influence of the stock market, but also "provided Sun with one of the industry's most critical, though intangible, assets: a reputation as a leader in technology," (Hall & Barry, 1991, p. 21).

By the end of the 1980s, Sun was no longer unique in advocating open systems; user demand for interoperability quickly compelled the industry in general to move in this direction (Garud & Kumaraswamy, 1993; Hall & Barry, 1991, pp. 35–36). Much of the computer industry had turned to technical standards, more or less freely shared, to create stable markets (cf. Fligstein, 2001). Carl Cargill, director of standards at Sun from 1998 to 2008, made clear the nature and necessity of standards: "Fundamentally, all complex organizations derive some degree of stability (or rigidity) from standardization," (Cargill, 1997a, p. 9). The primary function of standardization in the IT industry, according to Cargill,

> is to create new markets for the products of the organizations involved. In an analysis of standards committees, it was shown that a majority of the participants were there to achieve an objective that enabled their organization to produce or procure product. Standards, within the IT industry, are used as a marketing tool to create and expand the pool of possible buyers. (Cargill, 1997a, p. 24)

Cargill's understanding of the role industry standards development processes illustrates the going plant-going business relationship that the open systems movement was trying to establish as the dominant conception of control in the industry. Standardization is an essentially technical, plant-side process, but its ultimate purpose is in generating profitable transactions for the firm's involved. Participation in this process was the obvious means of stabilizing business relationships surrounding these rapidly changing and interconnected technological architectures (though this is not to suggest standards would necessarily create the stability sought).

The dominant means of organizing producers toward these ends emerged as the standards consortium, collections of "like-minded companies who are devoted to doing something using the same basic technology," believing that "if they could get a common technology out, they could all compete using this common technology," (Cargill, 1997a, p. 125). These standards bodies differ from the traditional standards development organizations (SDOs) such as the

International Organization for Standardization (ISO) or the American National Standards Institute (ANSI) in a number of crucial ways. First, they are argued to be faster than national SDOs in producing a specification (but see Cargill, 1997b). This is the case because consortia tend to focus on specific problems identified with real markets, and restrict their membership, typically through large membership fees, to those with an actual implementation interest. SDOs, in contrast, often have requirements of consensus that extend membership to interested parties beyond the firms that will use the standard to produce a salable product. Consortia, moreover, usually have marketing groups, whereas SDOs often lack the budget to market their specifications to the industry. In consequence, consortia were found, beginning in the 1980s, to be a more practical means in solving the business problems of IT firms (Cargill, 1997a; Cargill & Succi, 1998; for a more detailed discussion of consortia and SDOs see Schoechle, 2009).

The standardization process facilitates what Cargill (1997a, p. 87) has called 'competitive cooperation' (or 'cooperative competition'). This term is used to describe the openness, or cooperative nature, of the standards process which creates the environment in which competition can ensue.

> It is with the proprietary implementations that providers make their money. The idea behind the open specification … is that there will be competition based upon the implementation derived from the specification…. It is with the implementation that there is a divergence among the 'open' providers. (Cargill, 1997a, pp. 31–32)

This, however, is not to suggest that behavior deleterious to the user and destructive and wasteful competition are extinguished at the formation of a standards consortium. Shapiro and Varian (1999) document a number of ways in which the 'concessions' of openness and cooperation can be strategically valuable to a firm in ways similar to the proprietary model described in the previous chapter. Likewise, the industry has been known to spawn multiple consortia which struggle for control of a particular technology (see, e.g., Cargill, 1997b). In these standardization

wars the 'openness' of the technologies is alleged by both parties, yet a strategic maneuvering ensues over which specification will be adopted by the industry as a whole. The problem of technological standardization, in these instances, becomes unwarrantedly prolonged and the market may pick the inferior specification. The struggle over the direction of UNIX in the late 1980s-early 1990s (Hall & Barry, 1991) is likely the most infamous of these wars. Of this conflict, Cargill (1997b, p. 133) notes: "Both sides spent tremendous amounts of money proving that they, and not their competition, were the true 'open system'." Likewise, Cargill (1997b) believes a related battle over choice of Graphical User Interfaces (GUI) resulted in the adoption of the inferior technology. The conflict over XML-based document formats provides a more recent instance (see Kosek, 2008).

Though the open systems movement did not mark an end to the social costs of business enterprise, it did mark a substantially different construction of business strategy. In a sense, then, the shift in market governance was not from proprietary firms to 'open' firms – by the early 1990s most firms at least claimed to be open, including the dominant proprietary firms of the previous decade. Rather, the shift was from management of technological change by firms through their tightly controlled platforms to the consortia of firms that would develop the standards that would define markets.

As discussed in the previous chapter, market governance rarely, if ever, develops in the absence of state involvement. The open systems conception of control is no exception. The next section provides an examination of the restructuring of intellectual property law in the US which roughly coincided with the open systems movement. Following that, an interpretation of the public policy of the courts in light of the history discussed herein will be given.

Competing Conceptions of Control and Copyright

The open systems movement that began in the 1980s had, by the early 1990s, fomented notable conflict within the computer industry. Band and Katoh (1995, pp. xviii–xix) described three factions that developed concerned with what they termed the 'interoperability debates': (1) the 'ultraprotectionists', including IBM, DEC, Apple, and Lotus—established firms with large market shares, controlling de facto standards; (2) minimal protectionists, including academicians, developing countries, and the Free Software Foundation headed by Richard Stallman; and (3) open systems providers such as Sun. Here we will focus on the views of the first and third factions, representing the more important business enterprises involved, though it should be noted that the second faction was not unimportant for the industry or the legal developments presented here.

Addressing a crucial issue of market governance in the industry, these debates took place through industry punditry, marketing, legal scholarship, and so on, but most importantly through litigation. The central question, coming typically before the circuit courts, was simple: "could one firm prevent other firms from developing software products which were 'compatible' or 'interoperable' with the products developed by the first firm?" (Band & Katoh, 1995, p. xvii). In terms of the going concern model, this question can be rephrased as, did the control of the going business side of a firm over its going plant relationships extend to the creation of differential advantages in the interoperability of technologies, and, if so, to what extent? Though the cases involved specific technologies and firms, the industry more broadly participated through expert witnesses and *amicus* briefs submitted by the various trade organizations representing the different factions. Among these, the Computer and Business Equipment Manufacturers' Association (CBEMA) and Computer Systems Policy Project (CSPP) are notable associations

representing the 'ultraprotectionists', while the American Committee for Interoperable Systems (ACIS) was a prominent advocate on the other side.

The positions of the ultraprotectionists and the open systems firms can be seen in their definition of 'interoperability'. As noted, the industry as a whole had moved toward 'open systems', at least in name. Yet, the extent of the openness remained controversial. Band and Katoh define interoperability, or "the ability to interact", as having "two principal dimensions":

> interchangeability and connectability.... Interchangeability refers to the degree to which one product can substitute for another.... Connectability refers to the degree to which a product can participate in a joint activity without requiring other connected products to alter their mode of operation. (Band & Katoh, 1995, pp. 5-6)

The ulttraprotectionists tried to limit the meaning of interoperability to connectability only. A statement from ACIS explains the competitive implications of this definition:

> '[I]nteroperability' as defined and understood by dominant vendors that own 'de facto' standards is a one-way street. Such vendors support and at times encourage other vendors to develop new products that are 'compatible' with their 'de facto' standard in the sense that they enhanced functionality…. True interoperability … extends also to products that may substitute for and thus compete with the proprietary 'de facto' standard product owned by the dominant vendor. Needless to say, dominant vendors, acting in an economically rational fashion, do nothing to foster such truly open and interoperable systems. (quoted in Band & Katoh, 1995, pp. 5–6)

A 1994 hearing of the House Telecommunications and Finance Subcommittee similarly found contention over the definition of 'open' as it concerned the operating systems for set-top box interfaces[3]. Microsoft's Senior VP for Advanced Technology, Nathan Myhrvold, testified, defining the term to include connectability but not interchangeability. Sun's Wayne Rosing, on the other hand, insisted the term and the law protecting it include the potential for competing

[3] The boxes were believed to be the means by which most households would access the 'national information infrastructure' in the future.

products – that is, for interchangeability. Indeed, Rosing went as far as to argue that the government should mandate open interfaces, including public documentation, timely notice of alteration, and no intellectual property rights or licensing fees (Band & Katoh, 1995, pp. 330–333). The policy which Rosing advocated indicates the essential means by which firms in the industry had sought to manage technological change and maintain differential advantages. One of these – copyright – will be discussed presently.

The accepted scope of interoperability as it concerned protection of interface specifications through copyright would be worked out through years of litigation. A brief summary of this case law as it pertains to the subject of this work follows. It will be shown that the scope and depth of US intellectual property rights have been developed in an effort to allow firms to control technologies without creating unreasonable restrictions on interoperability. To these ends, Congress responded to industry demands in extending copyright protection to software, as discussed previously. The courts, however, subsequently limited these rights to a degree, taking into consideration the business exigencies of a fundamentally interconnected technology.

The key issue in these copyright cases was the subject matter of copyright: what could and could not receive protection. In particular, it has been long-standing law that ideas, discoveries, procedures, and the like cannot be copyrighted, though the expressions of these may be protected, with certain limitations. Section 102(b) of Article 17 of the U.S.C. has codified this, forbidding the extension of copyright protection specifically "to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work," (quoted in Band & Katoh, 1995, p. 58). An important doctrine deriving from this understanding of the distinction

between copyrightable and non-copyrightable subject matter has been called the 'idea/expression dichotomy':

> Once an author reveals his work to the public, he injects the idea into the public domain and must be content to maintain control only over the *form* in which the idea is expressed. Copyright extends only to the specific, concrete, expressive vehicle through which the creator's ideas appear.... This fundamental principle of copyright law cuts across the entire range of copyrightable subject matter.... Ideas, discoveries, principles, and facts are freely accessible to the public, and to confer property status on them would hinder rather than promote 'the progress of science and the useful arts,' thereby undermining the constitutionally declared purpose of copyright. (Leaffer 2005 pp. 80-1)

In part, this distinction is made to prevent copyright from extending patent-like monopolies without the substantially more rigorous requirements[4] and review process of patents (see Leaffer, 2005). The leading case, *Baker v. Selden* (1880) illustrates how the courts have applied this framework and when expression, or implementation, of an idea or system is not protected. In this case the widow of Selden sued Baker for infringing the copyrights of her late husband's books. The books themselves were comprised chiefly of forms for implementing a book-keeping system, and Selden claimed copyright for these forms. The Supreme Court found no infringement, however, arguing that the expression inherent in the forms was a necessary part of implementing the book-keeping system. Because systems are the subject of patents, not copyright, recognizing copyright protection for the forms would effectively allow the circumvention of the more rigorous process of obtaining a patent (Leaffer, 2005).

[4] Unlike copyrights, patents require an examination process by the US Patent and Trademark Office to establish that the product or process under consideration has utility, is novel, and would not be obvious to a person skilled in the relevant art (see, e.g., Jaffe & Lerner, 2004; Karjala, 1997)

Merger

The *Baker* ruling has been interpreted as establishing the 'merger doctrine', holding that "where the use of an idea requires the copying of the work itself, such copying will not constitute infringement," (Leaffer, 2005, p. 85). In such an instance, the idea and the expression of the idea are said to have merged[5] and the public interest in access to the idea is found to trump the private interest in protecting the expression (*Computer Associates Intern., Inc. v. Altai, Inc.*, 1992, pp. 707–708 to be discussed shortly). Merger doctrine was a central issue in the first case relevant to the interoperability debate (Band & Katoh, 1995, p. 84): *Apple v. Franklin* (1983). However, paralleling the historical development of open systems – i.e. interoperability – as a business strategy, the Third Circuit found in favor of protection for the intellectual property of the proprietary firm, Apple. In this case, Apple sued Franklin, a small applications programming firm, for infringement of the operating system of its Apple II personal computer. While the facts of this case, and even the ruling itself, do not bear directly on the issue of the copyrightability of interface specifications (see Band & Katoh, 1995, pp. 84–91), the following *dictum* marks an important early ruling on copyright and interoperability:

> The idea which may merge with the expression, thus making the copyright unavailable, is the idea which is the subject of the expression. The idea of one of the operating system programs is, for example, how to translate source code into object code. If other methods of expressing that idea are not foreclosed as a practical matter, then there is no merger. Franklin may wish to achieve total compatibility with independently developed application programs written for the Apple II, but that is a commercial objective which does not enter into the somewhat metaphysical issue of whether particular ideas and expressions have merged. (quoted in Band & Katoh, 1995, pp. 86–7)

[5] The doctrine can be stated more generally as applying to cases in which the expression cannot be separated from the idea, method of operation, or function involved. In each case, the expression cannot be protected without also protecting subject matter that is expressly excluded from copyright protection under Section 102(b) (Burk, 2007, p. 592).

The argument made in *Franklin* effectively defeated any case for merger of idea and expression in a technology so long as the possibility existed of creating products which interoperate with similar technologies. In the example of a program compiler used in the quote above, the specifications necessary for such a compiler to 'work' with Apple's operating system were protected so long as one could write a compiler for another system – e.g. a compiler for DEC's VAX machine (Band & Katoh, 1995, p. 87). Of course, DEC could make the same argument in reverse to prevent a similar third-party application from interoperating with its machines. Effectively then, the purview of the going business over the going plant was, by virtue of the firm's intellectual property rights, absolute as it concerned third parties to the engineer-user relationship of a controlled technological process. Any attempt to create interoperable technologies was, therefore, a 'commercial' behavior against which the copyright holder was presumed to be protected. The logic of the argument conforms well to the proprietary model that dominated the industry at the time: the technological specifications of the industrial system – in this case, the interfaces of computer systems – were to be dictated by the business concerns of the dominant business enterprises controlling 'de facto' standards (i.e. platforms); all others were left to align themselves accordingly, through managerial transactions with the dominant firms.

The reader will recall that the *Telex* case, concerning IBM's S/360 discussed in the previous chapter, involved a very similar situation as in *Franklin* – i.e. control of a technological platform and the reasonableness of restricting interoperability with competitors – though the *Telex* case was a matter of antitrust law. Stated another way, both cases involved the question of whether the courts would sanction differential advantages of the going business in terms of its restrictions on access to the going plant. And, although the Third Circuit did not cite *Telex*, the

dicta in *Franklin* quoted above is similar to the reasoning in the earlier case: so long as the firm petitioning effectively for interoperability could produce for another platform, the firm controlling the platform in question would be allowed to foreclose interoperability – that is, the differential advantages maintained by IBM or Apple, as the case may be, are reasonable.

The precedent of Franklin was abandoned somewhat gradually, beginning in the early 1990s with *Computer Associates v. Altai* (1992). Decided by the Second Circuit in June of 1992, this case constitutes the initial trend of the courts toward a property right regime that was less cumbersome to the interoperability of software. Computer Associates had developed a component for its application program called ADAPTER allowing the application to run on different IBM mainframe operating systems. Altai later hired a former Computer Associates employee to write a similar compatibility program. Though Altai's program was not a direct copy of Computer Associates',[6] the latter alleged copyright infringement of the code considered at higher levels of abstraction.

The case ultimately came down to the availability of suitable coding solutions for the problem which Altai's program was intended to solve: interoperability with IBM operating systems. Amicus briefs filed on behalf of Computer Associates, supporting broad copyright protection, had argued that the availability of alternative ways of expressing a solution to an engineering problem through code suggested that the particular expression chosen was protected. The court found protection to be more limited, arguing that protection should not extend where the 'freedom of choice' of programmers is,

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[6] Part of the code for Altai's program had in fact been copied by the former Computer Associates employee. On discovering this, however, Altai had that code re-written so as to avoid infringement. Despite this, Computer Associates maintained infringement of expressions at levels of abstraction above the literal source code.

> circumscribed by extrinsic considerations such as (1) mechanical specifications of the computer on which a particular program is intended to run; (2) compatibility requirements of other programs with which a program is designed to operate in conjunction; (3) computer manufacturers' design standards; (4) demands of the industry being serviced; and (5) widely accepted programming practices within the computer industry. (quoted in Band & Katoh, 1995, pp. 125–126)

In explicating its process by which courts may filter out non-protectable expression in a complex program, the Second Circuit furthermore noted that merger doctrine may apply when efficiency concerns substantially limited the range of expressions from which to choose. The court explained:

> In the context of computer program design, the concept of efficiency is akin to deriving the most concise logical proof or formulating the most succinct mathematical computation. Thus, the more efficient a set of modules are, the more closely they approximate the idea or process embodied in that particular aspect of the program's structure. (*Computer Associates Intern., Inc. v. Altai, Inc.*, 1992, p. 708)

The effect of the court's arguments was to hold that "interface specifications were not protected expression," (Band & Katoh, 1995, p. 126). The *Whelan* court had, through its interpretation of the nature of the technological relationships involved in computer systems, defined unqualified property rights over the going plant relationships of a firm. *Altai* reversed this, limiting the extent of the going business' control. Subsequent decisions (notably Atari v. Nintendo (1992), Sega v. Accolade (1992); see Band & Katoh (1995)) adopted the approach in Computer Associates concerning interoperability.

Scènes à Fair

Computer Associates, which referenced Kretschmer's (1988) arguments toward similar ends, held that the application of the merger doctrine must be anchored by consideration of the external environment in which the program is intended to be used. In this manner, it was argued, courts may find the balance between the incentives to create which protection gives and the

proliferation of, and competition in, ideas which often require interoperability of technologies (Band & Katoh, 2011, p. 37; cf. Leaffer, 2005, pp. 82–83). The courts recognized the competitive context of a firm's programs to be one of these external conditions. As such, the courts translated another doctrine within copyright law, *scènes à fair*, to maintain this essential balance. As applied to literary works, this doctrine holds that certain character-types, elements of plot, and so on that are common to a genre and therefore generally demanded by consumers are not protectable under copyright. As applied to computer programs, this doctrine would suggest that *de facto* market standards, requirements for interoperability, and other external conditions may preclude copyright protection of certain aspects of a program (Band & Katoh, 1995, p. 89). This doctrine was explicitly recognized in the *Altai* ruling, and is illustrated here by *Gates Rubber v. Bando* (1993), decided shortly thereafter.

The case involves competing manufacturers of rubber belts used in industrial machinery. To facilitate the proper selection of belts, Gates Rubber developed a program which used published formulas and mathematical constants developed in-house. After Bando hired employees away from Gates and developed a similar program, Gates filed suit alleging, *inter alia*, copyright infringement. The district court initially found that infringement had occurred. The Tenth Circuit then remanded the case to the district court on finding that the court had not considered modules within Gates Rubber's program to be unprotectable as *scènes* à *fair*. The Tenth Circuit noted that "[g]ranting copyright protection to the necessary incidents of an idea would effectively afford a monopoly to the first programmer to express those ideas," (1993, p. 838). Thus, as with merger, the purpose of this doctrine is to prevent over-extension of protection to the ideas necessary for the creation of new works (cf. Leaffer, 2005, p. 90).

Following these and other cases in the early- to mid-1990s, the issue of extending

copyright protection of the specifications necessary for interoperability was ultimately brought before the Supreme Court in *Lotus v. Borland* (1996). Though the court did not give a definitive interpretation of the law, or the theory with which to interpret future cases, its 4-4 split affirmation of the First Circuit's decision "allowed the trend throughout the circuit courts toward excluding copyright protection for function-dictated aspects of programs, particularly those elements necessary for interoperability, to continue unchecked," (Band & Katoh, 2011, p. 36). The facts of this case, furthermore, give a clear look into the definitions of interoperability that various firms in the industry were seeking to establish.

The case involved the developers of two spreadsheet programs: Lotus Development Corporation's Lotus 1-2-3 and Borland International's Quattro Pro. At issue in Lotus's allegations of infringement was not the code itself but the command structure by which users could execute spreadsheet functions as well as write 'macros' – essentially programs executed within the spreadsheet program which perform series of spreadsheet functions. In order to ensure compatibility with Lotus macros, it was necessary that Quattro Pro replicated the command structure of Lotus 1-2-3. As in *Franklin*, the issue revolved around whether a competitor could ensure interoperability with the programs written on another firm's platform. And, in line with the Third Circuit *dicta* to the *Franklin* case, the District Court for the District of Massachusetts in *Lotus* declined to find merger of idea and expression on grounds that Borland had a choice in command structures other than Lotus's. This interpretation would permit software developers to create programs which connected with an existing platform – here, Lotus 1-2-3 – but not competing platforms on which these programs could also be executed. The decision thus "effectively eliminated competition in operating systems or any software product that functions as a platform for other software products," (Band & Katoh, 2011, p. 25)

On appeal to the First Circuit (1995) the district court's ruling was reversed. The First Circuit found that, merger doctrine aside, the command structure of Lotus 1-2-3 was a 'method of operation' because it "serves as the basis for Lotus 1-2-3 macros," (1995, p. 818). As a method of operation, the command structure was not protectable under section 102(b). In coming to this decision, then, the court maintained the general trend of denying copyright protection to those aspects of technologies required for interoperability with technologies which were intended to connect as well as those intended to compete with the existing technologies.

In explaining their decision in *Lotus*, the First Circuit made notable reference to the interests of the user:

> Under the district court's holding, if the user wrote a macro to shorten the time needed to perform a certain operation in Lotus 1-2-3, the user would be unable to use that macro to shorten the time needed to perform that same operation in another program. Rather, the user would have to rewrite his or her macro using that other program's menu command hierarchy. This is despite the fact that the macro is clearly the user's own work product. (*Lotus Development Corp. v. Borland Intern., Inc.*, 1995, p. 818)

Thus, the Court extended the interoperability which copyright could not impede beyond that of connecting and competing software products, and into "the ability of a user to employ the same skill set with different products," (Band & Katoh, 2011, p. 37; cf. Karjala, 1997, p. 74).

The preceding has described the process by which the courts, taking instruction from Congress to protect computer software under copyright law, gradually developed a body of precedent that would reflect the public purpose of intellectual property law in the US. While a more thorough analysis would be required to make an argument of causality, it is here suggested that the law that developed was more or less in line with the conceptions of control that were evolving among private firms in the market at the same time. This is to suggest, once again, that the state did indeed play a significant role in the stabilization of these markets through its active role in defining reasonable conceptions of control. The model developed in the present work,

however, seeks to understand intra- and inter-firm coordination beyond mere stability; it seeks also to understand these processes in terms of relative discretion or control among the parties involved. Toward this end, the following section will discuss further the nature of interoperability and intellectual property law in the US in terms of the relationships of the going business and the going plant in the computer industry.

The Public Purpose of Intellectual Property

In applying the complex body of copyright law to software, the courts occasionally made reference to issues of efficiency in restricting the scope of protection. This is evident in the *Altai* case in which the court found considerations of standard programming practice, requirements for compatibility, and the efficient formulation of solutions to programming problems to suggest that such aspects of a program could not be copyrighted. The court thus concluded that the differential advantages which copyright affords could not unreasonably hinder the efforts of computer programmers in writing new programs. In other words, where going business interests conflict with the essential functions of the going plant, the interests of the latter should take precedence. Likewise, the courts have at times declined to recognize protection where engineers on the user side of the technology would be hampered in their use of the technology. This was the case in *Lotus* as well as *Mitel v. Iqtel* (1997) in which the Tenth Circuit upheld the district court's finding that the command codes for Mitel's telecommunications hardware were not protectable under the merger doctrine and *scènes* à *fair*. Sony v. Connectix (2000) is discussed presently to provide one more example of the courts' recognition of efficiency concerns in applying copyright law to software.

Connectix had developed a console emulator for the Sony PlayStation gaming console, software which enabled users to play PlayStation video games on Apple computers. In

developing this emulator, Connectix loaded the Basic Input Output System (BIOS) firmware of the PlayStation into a computer in order to observe its behavior and ensure the compatibility of the emulator. Sony alleged infringement in the copying necessary for this task. The Ninth Circuit, arguing fair use, overturned the district court's finding of infringement, stating,

> Even if we were inclined to supervise the engineering solutions of software companies in minute detail, and we are not, our application of the copyright law would not turn on such a distinction.... [T]he rule urged by Sony would require that a software engineer, faced with two engineering solutions that each require intermediate copying of protected and unprotected material, often follow the least efficient solution....This is precisely the kind of 'wasted effort that the proscription against the copyright of ideas and facts...[is] designed to prevent'.... Such an approach would erect an artificial hurdle in the way of the public's access to the ideas contained within copyrighted software programs. (quoted in Band & Katoh, 2011, p. 62; see Band & Katoh 1995, p. 301 for further discussion of the precedent involved; see also *Sega Enterprises Ltd. v. Accolade, Inc.*, 1992)

In light of the going concern model, however, it is clear that the courts' aversion to wasted effort should be considered in terms of relative, rather than general, efficiency. The courts have found themselves confronted with cases of somewhat novel business practice that oversteps what has been considered reasonable exclusion of others – in most cases, competitors – from access to valuable technological knowledge. The underlying issue is not the efficient use and development of the joint stock of knowledge, but rather the most appropriate means of achieving the balance between incentive and dissemination among the alternative methods of restricting access to that knowledge in the pursuit of profitable transactions. Indeed, intellectual property law has historically been concerned with knowledge held secretly and its dissemination in the public interest (see Sell & May, 2001). That is, the institutions of intellectual property are institutions of business, first and foremost.[7]

[7] May and Sell have traced the evolution of intellectual property at least as far back as fifteenth century Venice, finding that "[a]s intellectual property emerged as an institution, whatever

Dennis Karjala (1987) recognized this in framing the issue in terms of the various regimes of legal business strategy – patents, copyrights, trade secrecy, and lead-time advantages – and comparing the protection afforded software to that afforded with other technologies. Of note in this regard is Karjala's correct assessment that it is 'slavish copying' or 'piracy' that is the central problem which copyright in software is intended to solve (see chapter five above). This is strictly a business problem, specifically as it regards maintaining the going plant. The nature of the economic system, driven by pecuniary interests and thus differential advantages between firms and other individuals and organizations, is wrapped up with both this problem and the framework with which it is addressed; otherwise, it would be difficult to find any quandary in the efficient dissemination of useful information which is widely understood to be without cost.

As discussed in this and the previous chapter, the courts, taking their instruction from Congress, applied copyright law to software technologies and proceeded to work out reasonable rights and duties through the cases that came to them. The application of copyright law to software in turn created a new problem, or at the very least brought an existing problem of the proprietary model to the forefront: maintaining reasonable access to vital parts of the industrial knowledge necessary for vendors to continue to augment the joint stock of knowledge. In addressing these issues, the courts have reworked a body of law that was not intended for this industry to the necessities of invention (Veblen, 1914); and in doing so they have sought primarily to maintain broader norms of competition and control over technology. To the extent that the norms find wasted effort and resources abhorrent, and only to that extent, have the courts maintained a policy in favor of efficiency.

The history of the US computer industry discussed above and in the previous chapter

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subsequent justifications may claim, the rights and interests of the owners of knowledge, not its producers, were regarded as central to legislative innovation" (2001, p. 71).

supports this argument. Interoperability has remained confined to conceptions of business control over the going plant and the technological relationships encapsulated therein; it was not, that is, taken to mean unrestricted cooperation between the engineer and the user in the development of technological solutions. Indeed, the matters of user and worker discretion in the control of industrial knowledge were largely settled prior to the case law discussed above. This was accomplished, in part, much earlier, in the development of the standard practice of corporate ownership of the intellectual output of its workers (see Fisk, 2009). Since these developments, which culminated in the early twentieth century, employees have typically been excluded from property rights in their 'intellectual', or 'creative', output, receiving instead monetary compensation, praise, and the like. These have typically been defined by industry norms, falling outside the realm of intellectual property law (see Fisk, 2006, addressing, among other things, norms of attribution in the software industry).

Where the courts found firms trying to assert unreasonable control over the intellectual output of *other* firms' employees, that is, of users – e.g. the macros considered in *Lotus* – property relationships were maintained which would prevent such control. This must follow if the boundaries of firms are to be maintained in terms of property rights defining a stable going plant and its relationship to the going business. To recognize a going business interest of one firm in the going plant of another would be to sanction the sort of differential advantage that is at the core of the proprietary model which firms in the industry had recognized as an unstable conception of control.

Nonetheless, the user was largely marginalized in her discretion over the technological processes concerned. Once again, this had already occurred with the dissolution of the user group model, the productization of computer software, and the non-disclosure of source code, as

discussed in the previous chapter. In this sense, the proprietary model and the recognition of copyright over software preceded the open systems model by necessity in that these developments aligned the institutional relationships of the going plant to allow consistent 'capture' of technological interactions within the going plant. The open systems movement did not substantially reverse these trends so far as the user was concerned; it simply negotiated the extent of going business control over the going plant, so established. The legislative and judicial developments that sanctioned these forms of business were likewise concerned not directly with efficiency as viewed by the general public, but by stable methods of doing business. The resulting norms and laws have thus defined the boundaries of the technological relationships of going plants with an overriding interest in their survival on business terms. The terms of access to the social provisioning process, to the joint stock of knowledge, have likewise been defined in this manner.

At issue in the open systems movement was the legal recognition of the meaning of 'interoperable' – should it mean only that technologies controlled by different firms be allowed to 'connect' to each other, or that they should additionally be 'interchangeable' (Band & Katoh, 1995)? Following the *Altai* (1992) decision, the courts increasingly declined to sanction copyright protection that merely shielded a firm from the producers of interchangeable technologies. These were, in the terms of the GCM, differential advantages being asserted by the going business side of a firm which unduly hindered the going plants involved in the technologies at hand. *Compaq v. Procom (1995)* further illustrates that the courts' overriding interest was in stable business relations, not efficiency.

Procom produced hard drives which would interoperate with Compaq's servers. Compaq's own hard drives included internal parameters expressed in a particular order designed

to allow the server to predict failure of the drive and thereby trigger a warning. Procom copied these parameters for its own drives. In its suit against Procom, Compaq alleged infringement of its copyright in these parameters. Procom argued that the parameters were dictated by function and thus not protectable under the doctrines of merger and *scènes* à *fair*.

The court, however, rejected these arguments, finding that the parameters reflected "both engineering and business related judgments," (1995, p. 1415) concerning the appropriate time to trigger a failure warning. That is, in addition to engineering predictions concerning when the drive would actually fail, the parameters reflected considerations of the cost of replacing the drives as well as Compaq's unique relationship with its customers in terms of expectations of service and warranty agreements. "It seems unlikely," the court argued, "that other drive manufacturers, facing different economic considerations and different customer expectations, would choose the exact same point in time to replace a drive that Compaq chose," (1995, p. 1418).

Although perhaps not weighing particularly heavily on the legal precedent,[8] the *Compaq* decision suggests that, even when engineering considerations are recognized, efficiency concerns are trumped by a need to maintain business relationships within the going plant as well as between the going plant and the going business. While the precedent established in *Altai* prevented undue hindrance of going plant relationships in the interest of the going business, *Compaq* suggests that the limiting doctrines of merger and *scènes* à *fair* must not categorically denying a firm's intellectual property interest in its going plant, even where efficiency would dictate denial of protection. That is, where these business relationships do not unreasonably conflict with the going plant's own requirements for stability, copyright protection will not be

[8] The case was not appealed to the circuit courts.

denied (cf. Band & Katoh, 2011, pp. 105–6).

Finally, despite Leaffer's (2005, p. 89) belief that copyright law should not be 'overloaded' with antitrust concepts, the courts and legal scholars alike (e.g. Hovenkamp, Janis, & Lemley, 2001; Karjala, 1999; Lemley, 2007; Rogers, 2001; Samuelson, 2008; Bartkus, 1976) have generally been unable or unwilling to keep matters of antitrust and intellectual property separate (cf. Hamilton, 1957; Rutherford, 2010). As was suggested in chapter four, the framework developed and applied in this dissertation suggests at least one criterion which ties these bodies of law together in sanctioning, guiding, and regulating the governing norms of industry: balancing the public's interest in accessing industrial knowledge against the competitive interests of business in limiting this access. Consideration of this fundamental balance suggests, for instance, that in *Altai* the Second Circuit was effectively ruling on reasonable versus unreasonable monopolization, much as the Tenth Circuit had done, albeit with a very different ruling, in the *Telex* case (see chapter five above) concerning antitrust violations.[9]

Understanding the public purpose of the courts in this manner reinforces the argument that the courts' overriding interest is in stabilizing business relationships in the face of complex and potentially conflicting inter- and intrafirm relationships. Though the courts have often relied on notions of the community's interest in technological progress, it is clear that this is more appropriately understood as the going plant's interest in continued transactions between producers and users. Where business practices were found to upset or unreasonably impede these processes, as in *Altai* and many of the rulings that followed, the courts refused sanction. Likewise, when no such finding was made, as in *Telex*, *Franklin*, and *Compaq*, the practices

[9] Similar analysis could be extended to a number of important cases which fall outside the scope of the present analysis, notably *U.S. v. Microsoft Corp.* (2001; cf., e.g., Carrier, 2002). As noted in chapter seven, below, future research is required to apply to, and further develop the GCM in light of, these cases.

were permitted.

In consequence, Courts have occasionally sanctioned the practices which stem from the going business rather than the going plant, despite the interests of the former having no direct connection to the interests of the community in general. This, once again, suggests that the courts' purpose has been to provide stable forms of business organization vis-à-vis technological processes, to promote the going enterprise as an organization of going plant and going business. And while the quasi-efficiency concerns of the going plant have often received priority over the differential advantages of the going business, the courts have in none of the cases discussed herein prioritized the interests of the community in access to, and control over, the joint stock of knowledge outside of the context and the logic of business.

All of which stands to reason, given the legislation in intellectual property and antitrust law which the courts have been tasked with interpreting and applying. However, considering the matter through the lens of the Veblenian dichotomy, outside of the business institutions of modern capitalism, the public purpose which the courts and legislatures have pursued appears flawed. If it is the case, as depicted in the going concern model, that business operates fundamentally through connecting the usufruct of technological knowledge as a means to pecuniary (i.e. non-technological) ends, then notions of market incentives for innovation may seem perfectly valid though they are in fact oxymoronic. Consider, for instance, Hamilton's (1943) illustration of a patentee whose patent was written sufficiently broadly as to "lay across the channel along which experimental work would have to move."

> The patentee could employ his exclusive right to advance, impede, or halt every attempt to get ahead. He became the focus of a curious paradox. The very purpose of his 'franchise' was 'to promote the progress of science and the useful arts;' yet he could veto every advance which was not to his personal advantage. (p. 25)

The public purpose that would be sought in a discourse freed of such myths as the

innovative enterprise would seek the most effective organization of access to the joint stock of knowledge, taking the implications for potential innovation as one consideration in defining this organization. Notions such as balancing the interests of innovators with competition or with follow-on innovation (see Band & Katoh, 2011, and Ed Black's forward therein) may be useful in the incremental adjustments of the community's institutions, legal and otherwise (cf. Foster, 1981); however, these should not be taken as ends in themselves, as to do so would be to impute to the business enterprise, in which the community's instrumental knowledge is to a great extent controlled, the creative potency of the community's knowledge itself (Ayres, 1967). Hence, while it is beyond the scope of the present work to do so, it would be necessary to consider a broader set of potential policies if the mitigation of ceremonial business behaviors and the efficient use and development of the joint stock of knowledge are to be adequately addressed.

Developments since the Open Systems Movement

In the 1990s the courts guided and refined what would be accepted as reasonable conceptions of control through their interpretations of the copyright law, both as directed by Congress and taken from earlier precedent. The courts ultimately sided with the open systems firms of ACIS, Sun Microsystems included, in maintaining interoperability in terms of both connectability *and* interchangeability. The more complete control over intellectual property that favored the proprietary firms was mitigated, at least as far as copyright was concerned.

Though an extensive analysis cannot be given here, a few words are in order regarding subsequent developments in the market governance mechanisms of the computer industry and public policy. The present chapter has focused on the open systems movement and developments in copyright law that were center stage in the 1980s and 90s. These issues dominated the discourse in the industry, legal scholarship, and policy debate because they were

believed to be the most practical way to address the problems of firms in the industry at the time. By the 1990s, however, many firms were moving toward alternative, or supplemental, means of establishing and maintaining differential advantages – namely, the 'appropriation mechanisms' of software patents and technology-based solutions to prevent copying and reverse engineering. Here again government policy has been an integral part of these developments.

In an effort to conform to international treaties on intellectual property as well as to further protect, especially, the entertainment industry from piracy, Congress enacted the Digital Millennium Copyright Act (DMCA) in 1998 (Faust, 2008). This law gives copyright holders an additional recourse over and above suits for copyright infringement against those who circumvent technological features designed to prevent unauthorized access or distribution of copyrighted materials. It furthermore prohibits distribution of technologies designed to facilitate such circumvention (Perzanowski, 2009).

The DMCA indicates *prima facie* that efficiency is of secondary concern in the development of copyright law. This law was designed explicitly to prohibit technology facilitating access to useful knowledge and to encourage encumbering other technologies with features that serve no purpose other than to limit access.[10] Beyond this, there has been a great deal of controversy concerning the extension of stronger protection over technologies than had been established through the copyright cases discussed above. Of chief concern here is the proscription of reverse engineering for the purposes of developing interoperable technologies which, since *Sega v. Accolade* (1992), had been held a fair use (see also *Connectix* (2000) discussed in the previous section). As Perzanowski (2009) has argued, while the law expressly

[10] As Rogers (2001, p. 94) has noted, "DMCA's prohibitions marked a significant departure from copyright law, that, historically, had regulated the use of, but not access to, information and had not regulated technology."

exempts such reverse engineering from the provisions of the DMCA, the courts have interpreted the law so as to impede interoperability that would otherwise have been unhindered. The Act has in fact been used to extend patent-like control over tangible products which incidentally embody copyrighted software (Lipton, 2005).

In addition to technological impediments to access, there has been a trend in the US and elsewhere to seek patent protection of software, including the interfaces thereof. Samuelson (2008) suggests that this trend follows from the courts' increasing unwillingness in the 1990s to extend copyright protection to interfaces while at the same time the US Court of Appeals for the Federal Circuit (CAFC), US Patent and Trademark Office, and the Supreme Court were becoming more inclined to recognize software as a patentable subject matter (cf. Jaffe & Lerner, 2004). This situation benefits firms wishing to secure greater legal protection of their held knowledge in a number of ways, including preventing imitation through reverse engineering (de Vuyst & Steuts, 2005). Moreover, the administrative and judicial system appear not to have high requirements for disclosure (typically regarded as the social benefit from patents) of details of an innovation in interfaces. Firms can thus obtain a high-value asset in a patent for an arbitrary innovation, making the strategy particularly appealing from a business standpoint (Samuelson, 2008).

A number of additional strategies have been recognized which diverge from the intended purposes of the patent system. These include blocking competitors from a general field of technology by filing as many patents in that area as possible, i.e. developing a so-called 'patent thicket'; forming alliances or merging to establish a better negotiating position vis-a-vis competitors; bolstering a firm's 'technology image' to increase the putative value of the company; and impeding competitors' patent activities in general (Blind & Thumm, 2004). In the extreme,

firms may pursue a business strategy that involves no use of the protected knowledge whatsoever. Instead, the ownership of patents of valuable knowledge is used by these so-called 'patent trolls' simply to extract licensing fees and damages from other firms (see, e.g., Risch, 2012; McDonough III, 2006). As discussed in chapter four, this would suggest firms which have evolved to that 'pure' form of business, the non-producing enterprise, described under the third degree of separation, dealing wholly in the intangible property rights of firms themselves without direct connection to the going plant of the industrial firm.[11]

Despite a growing propensity for firms to patent their software it is unclear that the patent has come to dominate this area of technology. Empirical work suggests that only a small portion of software patents are filed by software vendors, though many of the most prolific patent filers are dominant firms within the computer industry more broadly conceived, e.g. IBM, HP (Hunt & Bessen, 2004). The 2008 Berkeley Patent Survey (Graham et al., 2009), furthermore, suggests that patents are not considered especially important relative to first-mover advantage, secrecy, copyright, and other forms of competitive advantage among the smaller, younger firms in the software industry. Again, this says nothing of the dominant firms, however.

Nonetheless it is unclear that software patents have substantially hindered the interoperability of new technologies. Samuelson (2008) reports that her interviews with numerous industry insiders turned up surprisingly little evidence of patents impeding interoperability. Cooperative agreements between companies sharing their patent portfolios are one means by which property restrictions are mitigated in the mutual interests of firms

[11] 'Non-practicing entity' has also developed as a, perhaps less pejorative, appellation for these firms. Similar business models for copyrighted works – notably in entertainment content and news articles – have developed more recently (see, e.g., Balganesh, 2012; DeBriyn, 2012; Downing, 2010). To the present authors' knowledge, however, these 'copyright trolls' have not had a significant impact on the production, distribution, or use of computer software in general.

concerned. This is to say that such cross licensing is an important form of market governance allowing innovation to proceed while avoiding what the industry considers unreasonably wasteful litigation (Jaffe & Lerner, 2004, pp. 59–64).

Moreover, the trend toward software patents and technology-based restrictions protected by the DMCA do not necessarily mark a complete reversal in the industry toward the tighter, more monolithic control that characterized the industry prior to the open systems movement. In contrast to these legal and technological developments, many firms have developed relationships with open source communities as part of a business strategy that in many ways resembles a new version of the open systems strategies discussed above. Free/Libre Open Source Software (F/LOSS) are software projects typically developed and maintained by a community of volunteer programmers collaborating over the internet. With source code for these projects being freely distributed, the software is maintained and developed without the legal and technological restrictions of proprietary software. Its origins date back to the 1980s, when Richard Stallman at the Free Software Foundation developed the GNU General Public License, using copyright law to create licensing agreements that would ensure freedom to use, copy, and change programs (Hippel & Krogh, 2003). F/LOSS can thus be understood as creating a bulwark against the control over the joint stock of knowledge embodied in code.

While the business community was initially skeptical of F/LOSS,[12] many firms have embraced these projects, investing resources and at times even purchasing programs for the sole purpose of making them public domain and thus amenable to open source development (Alexy & Reitzig, 2011). Naturally, this confounds the standard theory of firm and individual behavior.

[12] For instance, Bill Joy, principal designer of the Berkeley Software Distribution (BSD) version of Linux and co-founder of Sun, expressed lukewarm feelings about open-source, citing the need for business to ensure customer support (Shankland, 2002).

The absence of legal control of the code – indeed the explicit rejection of this through open source licensing – ensures that there is no market for the technology produced: no going plant can form in which monetary transactions can be made. Likewise, lack of monetary compensation to those involved in developing the software does not square with traditional approaches to producer motivations. Hippel and Krogh believe the problem with the conventional approach lies in its assumptions which exclude the possibility for motivations in which "private investment and collective action can coexist" (2003, p. 213).

More directly pertinent to the empirical analysis of the present work, research indicates that for-profit firms will contribute to these for a number of reasons. First, open source projects allow firms to solve technical problems at a low cost while drawing on a large and diverse knowledge base (Raasch & Hippel, 2012). The strategy is essentially the same as Sun's open systems strategy, indicating the instability of the proprietary model which typically requires the firm to incur higher costs in developing its own technologies.

Second, as will be familiar from the forgoing narrative, firms may contribute to technological development in an effort to increase the importance of complementary products which it does control and market. Campbell-Kelly and Garcia-Swartz (2009), for instance, argue that the sale of services and middle ware, as well as an attempt to unify its platform, are behind IBM's support of open source software, including the GNU/Linux operating system.[13] This is essentially another instance of keeping the standards free (in both senses of the term) while selling the implementation.

Finally, Alexy and Reitzig (2011) argue that even in the absence of network externalities directly associated with the firm's profitable lines of business, F/LOSS as a business strategy,

[13] IBM's support of F/LOSS began in the late 1990s. See also Williams' (2002) account of Robert Young's Red Hat Linux (and Young, 1999).

including the waiving of exclusion rights to technology currently owned, may be warranted in the presence of proprietary competition. This is because proprietary technologies can threaten the viability of open source projects – e.g. through patent thickets and 'trolls' – necessitating defense from firms seeking to capture value from these projects over time. Contributing resources and intellectual property then provides a bulwark of rights against those of proprietary firms and may even create 'reputational cost barriers' preventing proprietary firms from asserting legal control over technologies. (Recall Sun's strategy of establishing a "reputation as a leader in technology.") Thus, Alexy and Reitzig find that such private-collective relationships coordinate the behavior of actors in the industry and "enable them to jointly design industry-regulating institutions to facilitate value capturing," (2011, p. 6).

Conclusion

Strategy and law continue to co-evolve. New legal developments, including novel proscriptions against circumventing technologies designed to prevent copying and reverse engineering and increasing recognition of patents in software, suggest an atavism in the industry in favor of the proprietary model. On the other hand, the development of F/LOSS and firms' support of these projects suggest an increasingly sophisticated approach to 'open systems' in business.

On the whole, it would appear that the conflict between the proprietary and open systems models has not been settled. The industry continues to grapple with stable conceptions of control, and these issues still revolve in large part around property rights over the technologies concerned. However, there are tendencies away from both extremes: firms pursuing open systems have an incentive to become more closed or proprietary in the sense of becoming less forthcoming with interface specifications as their market share grows (Samuelson, 2008); while

firms in the industry in general are likely to realize some benefit in adopting open systems, if only to a limited degree (see, e.g., Kosek, 2008 on Microsoft's adoption of an open format for its office suite).

All of this would suggest that the stable form of market governance, if it exists, will be found in some form, likely a complex set, of technological and legal relationships which balance secrecy or other protection for the going enterprise and collaboration between those in the going plant relationships concerned. As a matter of public policy, however, the concern for stable business relationships has clearly taken priority over the public's interest in access to the joint stock of knowledge. And while these are not necessarily mutually exclusive interests, the model of the modern business enterprise developed herein suggests that addressing conflicts between the two may require a framework which is not itself rooted in the logic of business.

CHAPTER 7

CONCLUSION

The chief aim of the preceding chapters has been to develop the going concern model as a contribution toward a heterodox alternative to existing economic theories of the firm. In pursuit of that goal, chapter two synthesized a meta-theoretical framework on which to build the model. In developing this framework, it was shown that there is substantial congruence between figures generally considered important to heterodox economics, particularly Tool, Veblen, Dewey, and Commons.

Among the theoretical concepts developed in chapter two are the going concern and its relationship to the community as a whole and the individuals that comprise it, as well as the methodological construct of the Veblenian dichotomy. This was requisite to situating the going concern model within a social provisioning process that necessarily rests on instrumental ways of knowing, doing, and valuing. Situating the model as such was in turn important for a theory of the business enterprise which does not see these organizations as synonymous with, or the result of, purely serviceable, productive behavior. Likewise, the contribution to the Veblenian dichotomy, addressing extant difficulties and misconceptions in the literature, was essential to the development of a model capable of elucidating the potentially wasteful and injurious characteristics of the modern business enterprise.

Chapters three and four then developed and discussed the going concern model itself. It was shown that the modern business enterprise can be conceptualized in terms of three degrees of separation between consumption and production, ends and means. Each degree of separation built on the last, producing additional ceremonial characteristics of the organization of the social provisioning process within and between business enterprises. It was argued, furthermore, that

the hierarchy of going concerns which developed through the three degrees of separation is ultimately built around some kernel of the community's joint stock of knowledge. The business enterprise, then, acts as a warden of serviceable knowledge, generating profitable transactions ultimately through its control over part of the joint stock of knowledge, and hence the social provisioning process itself.

As noted at the outset of this dissertation, heterodox economics has done little toward a systematic response to the theories of the firm developed within the orthodoxy. This may in part be due to some heterodox economists (e.g. Hodgson, 1998) taking the dominant alternative, the resource-based view, as adequate. However, it was argued that this view falls substantially short of the critical theories of the various traditions in heterodoxy. The going concern model, then, is a contribution to a critical theory of the business enterprise in that it identifies essential ceremonial characteristics, absent in the extant literature of this field, of the institution of the modern business enterprise. To recapitulate, these ceremonial characteristics are as follows.

The going plant – i.e. the technological relationships on which all business activity is founded, and which embody the myth that business serves the customer – will be organized in the interests of the user only incidentally, to the extent that those interests overlap with the requisites of pecuniary transactions between the business enterprise and the user. Beyond this, the organization will maintain positions which, though necessary to the technological processes involved, have been deemed inconsequential or otherwise undesirable in the fuller decision-making processes of the enterprise. The quality of conduct of those who fill these positions, the machine-tenders, will as such be diminished along with that of the user. The congruence of the enterprise as a whole is thus likely to be weakened as well, reinforcing the need to establish governing norms within enterprises and their markets.

As business strategies and property institutions move beyond the direct technological concerns of the going plant itself, the capacity to turn a profit through manipulations and maneuvers in the organization of industry on business terms contributes further to the business enterprise's slight of the community's interest as a going concern. In the extreme, though not to say uncommonly, the exchanges with which non-producing enterprises are concerned are consummated entirely in terms of property rights having no direct connection to serviceable processes. Under such incestuous circumstances, in which business trades claims on intangible business interests themselves, any number of degrees may manifest to which the creative efforts of the community are diverted further and further from the material and aesthetic ends that might be achieved.

In light of these ceremonial characteristics of the modern business enterprise, it was argued that the going concern model could address with novel insight an essential issue within the theory of the firm literature: the determinants of firm boundaries. It was argued that these boundaries should not be taken to indicate the efficient distribution of technological interactions between market and non-market transactions. Rather, an essentially political element must be recognized in the complex organization of the technological and business relationships of the business enterprise; and in consequence the boundaries that define these organizations, on both business and technological terms, are better described as the result of gerrymandering in the interests of the dominant parties involved. Thus, in contrast to the dominant theories of the firm in economics, the theory developed in this dissertation puts center stage the analytical and policy question of whether and to what extent the business enterprise hinders the use, maintenance, and expansion of knowledge.

Finally, chapters five and six provided an empirical grounding for the model, analyzing the history of the computer industry in the US. While this section of the dissertation is not principally intended as a contribution to economic history in its own right, it nonetheless furnishes some insight into the economic history and policy studies of technologies and law which have hitherto received relatively little scrutiny.

Specific attention was given to the development of software as a salable product and the governance mechanisms established or refashioned to produce stable interactions in those markets. This historical narrative afforded an opportunity to illustrate the essential relationships of the going plant and the going business as well as the role of the state in sanctioning, guiding, and stabilizing the business strategies involved. The essentially political nature of the organization of industry, amongst both business concerns and governments, was hence illustrated as well. Thus, in addition to buttressing the going concern model, these chapters contribute to the existing literature in heterodox microeconomics which draws on economic sociology in developing core and secondary concepts regarding market governance and the essentially reciprocal relationships between business enterprises and governments in stabilizing markets.

Future research

Because this dissertation has involved a substantial amount of synthesis of heterodox economic theory and ideas beyond economics proper, a number of lines of further expansion are obvious, having been given far less than exhaustive treatment herein. These include integration with other lines of inquiry both in and outside of heterodox microeconomics, especially post-Keynesian price theory; a more thorough comparison with established theories of the firm; and additional empirical work in the computer industry and beyond. Each of these will be discussed presently.

First, as noted in chapter four, the going concern model as well as the empirical work discussed herein is amenable to post-Keynesian price theory, in addition to other areas of heterodox microeconomic inquiry. To be sure, issues of pricing and costing have not been dealt with in detail in the present work, in favor of an analysis of the relationships between classes of employments, and between the modern business enterprise and the knowledge and values on which the social provisioning process is founded. Future research will draw connections between the interdependencies and conflicts within and between business enterprises and their costing and pricing decisions, with the going concern as the core, uniting concept.

Likewise, additional connections and syntheses are still to be made with this theory and work outside of economics, including areas such as sociology, psychology, and criminology. Further methodological work along the lines presented in chapters one and two would also be fruitful.

Second, this dissertation has been premised on the argument that the theory of the firm, a field within economics as well as management theory, would benefit from an alternative theory of the business enterprise built from heterodox ideas. As such, some attention has been paid to the three central questions which a theory of the firm seeks to answer (see chapter one), particularly the determinants of the boundaries of the firm. This, however, should not be taken as a comprehensive rebuttal to new institutionalist arguments in economics, the various resource-based approaches of the management literature, or other approaches to this field. Instead, a more detailed comparison between these theories and the going concern model, as well as the arguments from heterodox economics more generally, is still to be developed. Some progress along these lines has already been made, as, e.g., in Knoedler (1995), Adams (1992), and

Palermo (2000). The going concern model should assist in determining points of congruence as well as points of disagreement between these theories.

Third, the empirical component of this dissertation was aimed explicitly at understanding the modern business enterprise by analyzing its development, effectively from birth to some degree of maturity, vis-à-vis a relatively new technology. For these purposes computers, and software specifically, afforded a useful case. Understanding the various forms of organization that manage these technologies is far from complete, however. Further empirical analysis remains to be done, both in those events that followed the history given above, as well as the details which have been left out of what has been covered.

One particular line of inquiry in this regard which could not be explored deeply here is the free/libre open source software project. This alternative organizational form, characterized by an absence of (1) pecuniary transactions, (2) typical ownership rights over technology, and (3) the separation of production from consumption in general, would provide a good point of comparison to the for-profit firms under consideration here. Moreover, an analysis of the motivations of F/LOSS contributors as well as the mechanisms by which conflict is adjudicated would provide an opportunity to further explore the application of the Veblenian dichotomy to these alternative forms of organization.

More generally, it must be recognized that an empirical grounding of a theoretical contribution will never be comprehensive. The narrative of the history of the US computer industry developed herein is as much a reflection of the going concern model as vice versa; yet, it is expected that a heterodox theory of the business enterprise is applicable beyond this particular industry. For instance, much of the extant literature in heterodox economics and elsewhere concerning the modern financial sector forms the basis for the non-producing

enterprise component of the model, yet this was not a major focus of the case study given in this dissertation. Nonetheless, it is believed that the model would provide a useful framework with which to understand this sector of an economy as well. To test this will require further empirical and theoretical work. More generally, the concepts and arguments developed with the going concern model need to be applied to other industries as well as other historical and cultural contexts.

The Going Concern Model and Public Policy

Finally, the heterodox theory of the business enterprise is in need of further development with regard to the public policy implications of the theory. The analysis given in chapter six indicates questions and arguments which the going concern model produces in understanding the role of public policy in the development of technologies and industries; however, more work is required to fully explore the implications of the model for this issue. Fortunately, matters of public policy are by no means new to the scholarly work in heterodox economics and elsewhere from which the going concern model has been derived. The model then stands to benefit from and contribute to the already actively pursued questions and problems of public policy as it concerns the modern business enterprise. Save for the notes given in previous chapters, however, this work must wait.

What can be said at present and in closing is that economics, as it bears on public policy, is in need of critical theoretical contributions at a fundamental level. So-called 'analytical tools' such as constrained optimization, and even the basic concepts of the firm, production, and consumption, have been taken as value-free and self-evident. As Ayres (1967, p. 3) argued, with these tools in hand, economists "interpose the mechanisms of the market between our conclusions and the moral problems which gave rise to them." "But," he continued, "moral

considerations, being universal and omnipresent, have a way of leaking through the complexities of the market and coloring the results of even the most recondite analysis with a moral tint," (cf. Hamilton, 1919). And so it has been with this relatively young field, the theory of the firm, which in its mainstream variations tends to obscure class hierarchies, conflict, and alienation in attributing to the firm itself a mythical 'creative potency' of its own. Public policy cannot be duly informed by these methods.

The going concern model, in contrast, has been developed explicitly to explore and illuminate the potential shortcomings of the organization of production through for-profit firms. The model emphasizes the essential role the modern business enterprise plays in controlling (1) access to the essential knowledge on which society relies for its reproduction, as well as (2) the direction of the future growth of this joint stock of knowledge. It has furthermore been developed to illuminate the multi-faceted way in which this organization bifurcates our daily activities into production and consumption, ultimately shackling the personal and creative growth of all whose daily lives are substantially governed by business enterprises. Though this is only one contribution to a critical, heterodox body of thought, it is hoped it will not only further microeconomic theory but contribute as well to a discourse in public policy which aims ultimately to improve our lives through better organization of the community.

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