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**Economic Institutions and the Boundaries of the Firm: The Case
of Business Groups**

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Abstract

Business groups in all of their manifestations are informational mechanisms for coordinating complementary activities – for "gap filling." This is well known in the literature on business groups outside the Anglo-American sphere. Especially in developing economies, where markets are thin and institutions (including both political institutions and what I call market-supporting institutions) are weak or non-existent, coordination is often more cheaply undertaken within the boundaries of business groups organized as financial pyramids, typically under family control. These organizations are intimately linked to the coalition of territorial rulers that North and his coauthors (2009) call a natural state; and, indeed, such business groups are arguably themselves examples of a natural state, in that they represent a self-enforcing coalition with its own rules, norms, and mechanisms of enforcement. But even in developed economies, novelty and change create the sorts of gaps that call for business groups in the widest sense, including less-formal sets of "intermediate" relationships, as, for example, in industrial districts. In this sense, the economics of organization generally has perhaps more to learn from the literature on business groups than the other way around.

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22.1. INTRODUCTION.

The theory of the boundaries of the firm, or the economics of organization more broadly, is at the core of what Oliver Williamson (1975) long ago branded “the New Institutional Economics” (Klein 2000; Langlois 1986). Williamson’s own work has focused largely on the boundaries question and related issues.¹ By most accounts, Ronald Coase’s famous 1937 paper “the Nature of the Firm,” which ultimately set in motion modern thinking about the boundaries of the firm, was among the founding documents of the New Institutional Economics. It may thus seem odd to claim, as I wish to do here, that the modern-day economics of organization actually pays far too little attention to institutions. What I mean, of course, is that, although its subject is itself an institution — the firm and its various alternatives — the economics of organization does not make much analytical use of institutions in the wider senses of F. A. Hayek (1967), Douglass North (1990), Avner Greif (2006), and others. This observation is related to the much more common claim that the economics of organization does not make adequate use of history² (Langlois 2004).

By contrast, the literature on business groups around the world is thick with both institutional and historical detail. I take it as my charge in this volume to discuss the economics of organization, and the economics of institutions more broadly, and to

¹ “Transaction cost economics is part of the New Institutional Economics research tradition. Although transaction cost economics (and, more generally, the New Institutional Economics) applies to the study of economic organization of all kinds, this book focuses primarily on the economic institutions of capitalism, with special reference to firms, markets, and relational contracting. That focus runs the gamut from discrete market exchange at the one extreme to centralized hierarchical organization at the other, with myriad mixed or intermediate modes filling the range in between.” (Williamson 1985, p. 16.)

suggest the ways in which those theoretical strands can help to organize the institutional and organizational facts about business groups. But I also want to examine the ways in which the facts about business groups can influence how we think theoretically about the boundaries of the firm.

22.2. INSTITUTIONAL ANALYSIS: COMPARATIVE AND HISTORICAL.

Although economists from the classicals through Marshall and his followers had a lot to say about issues of economic organization, it was Coase's 1937 paper that touched off the modern literature on the subject, albeit with a lag of a quarter century or so. In that paper Coase asked the fundamental question "why are there firms?" and responded with the famous answer: firms can exist only if there is a "cost to using the price mechanism" (Coase 1937, p. 390). Broadly speaking, the economics of organization consists in theorizing about the nature and sources of these costs, now called transaction costs.

The set-up here is an instance of what Coase in his later writings (Coase 1964) would call *comparative-institutional analysis*. Rather than comparing the world we observe against an abstract theoretical model (a practice Coase derided as "blackboard economics"), we should set two real-world institutions side-by-side and compare their respective costs and benefits. From the point of view of prescription or policy analysis, Coase's plea amounted to a salutary attack on the doctrine of "market failure." It is meaningless to compare real-world institutions against a blackboard standard of perfection, and dangerous to imply (often tacitly) that government intervention is in order

² Jones and Khanna (2006) make the case for history in the more directly relevant context of international business studies.

without specifying the precise institutional form of that intervention and scanning it thoroughly for “government failure” (Coase 1964; Demsetz 1969). But the doctrine of comparative-institutional analysis also operates at the level of explanation. Implicitly in Coase, and explicitly in Williamson, one explains an observed organizational form by comparing that form with hypothetical discrete alternatives in order to show that the observed form minimizes transaction costs.³ The thought experiment is to compare “the market” as an organizational structure with “the firm” as an organizational structure.

But, to an extent not often appreciated, the imperfect “market” in the economics of organization is actually a relatively a well-functioning market as real-world markets go. The underlying assumption, normally unspoken, is that relevant background institutions — things like respect for private property, contract law, courts — are all in place. Whatever transaction costs then arise are thus the result of properties inherent in “the market” itself, not of inadequacies in background institutions.⁴ There is generally a tacit factual or historical assumption as well: that the relevant markets exist thickly or would come into existence instantaneously if called upon.⁵ In the economics of

³ “The underlying viewpoint that informs the comparative study of issues of economic organization is this: Transaction costs are economized by assigning transactions (which differ in their attributes) to governance structures (the adaptive capacities and associated costs of which differ) in a discriminating way” (Williamson 1985, p. 18).

⁴ As I will argue in due course, the imperfections that the economics of organization tends to discover in “markets” are not in fact inherent but are the result of the historical state of the market (market thickness or extent) or of institutions, especially those intermediate-level institutions I will describe as market-supporting institutions.

⁵ Williamson (1975, p. 20) is fond of assuming that “in the beginning there were markets.” He means this as a heuristic dictum not a historical claim: let’s assume that markets and firms are both equally capable — that both (and other forms, too, perhaps) exist and have at their disposal the same productive capabilities. This makes it easy to conduct a (static) comparative-institutional analysis. We can compare firms and markets as discrete institutional choices and then explain observed forms strictly on the basis of differences in transaction costs (and perhaps also production costs as understood in neoclassical terms).

organization, then, firms arise because, under certain circumstance, they are inherently superior to markets — even when those markets exist thickly and are well supported (albeit in ways normally unspecified) by background institutions.

In this respect, the economics of organization shares an outlook with another relevant body of literature, that of the late Alfred Chandler (1977; 1990) on the managerial corporation. Chandler certainly can't be accused of ignoring history. To a far greater extent than the economics of organization, he understood that markets take time to develop and that, in part at least, real-world firms often integrated vertically because markets were initially thin and underdeveloped.⁶ Yet, and also to a far greater extent than the economics of organization, Chandler believed in the inherent superiority of the firm — that is, of the large managerial corporation — over markets (and over other kinds of firms) at their real-world best. Steeped in Max Weber via Talcott Parsons, he saw the modern corporation much as Weber saw bureaucracy: as a modern and efficient attractor toward which developed economies were naturally tending (Langlois 2007). And, whereas Chandler is most attentive to history, background institutions are conspicuous by their absence from his explanatory framework (if not always from his narrative). In his account, the rise of the large multi-unit enterprise in the United States was driven by

⁶ “[I]ntegration ... should be seen in terms of the enterprise's specific capabilities and needs at the time of the transaction. For example, Williamson (1985, p. 119) notes that: ‘Manufacturers appear sometimes to have operated on the mistaken premise that more integration is always preferable to less.’ He considers backward integration at Pabst Brewing, Singer Sewing Machine, McCormack [sic] Harvester, and Ford ‘from a transaction cost point of view would appear to be mistakes.’ But when those companies actually made this investment, the supply network was unable to provide the steady flow of a wide variety of new highly specialized goods essential to assure the cost advantages of scale. As their industries grew and especially as the demand for replacement parts and accessories expanded, so too did the number of suppliers who had acquired the necessary capabilities. ... The point is that an understanding of the changing boundaries of the firm required an awareness of the specific capabilities of the firm and the characteristics of the industry and market in which it operates *at the time* the changes were made.” (Chandler 1992, pp. 88-89.)

impersonal economic forces: the lowering of transportation and communications costs attendant on the railroad and telegraph, along with increases in per capita income, that made it economical to produce or package goods centrally and in volume. This imperative required careful professional management to assure high throughput and thus lower costs (Chandler 1977). As the managerial firm matured, its (Weberian) advantage began to show, and the large multi-unit enterprise was able to adapt existing capabilities and develop new ones in a manner superior to older networks of owner-managed firms (Chandler 1990). Although the adoption of the managerial corporation took different paths in Europe and Japan, those differences seem more a matter of historical accident, managerial decisions, or even national culture.⁷ Antitrust policies, corporate law, or the state of development of financial markets seem to matter little.

All of this stands in sharp contrast to the literature on business groups, especially business groups outside the developed world, and to the related literature on the multinational corporation. Although much in these literatures draws upon both transaction-cost economics and the work of Alfred Chandler, the central explanatory focus lies not in a comparison of existing institutions with ideal or “optimal” ones in the abstract but rather on the roles of history and institutions in shaping organizational structure.

⁷ Culture is of course a kind of background institution, albeit a somewhat controversial one among social theorists. On this see Jones (2006).

22.3. COMPLEMENTARITY AND SIMILARITY.

As Harvey Leibenstein long ago pointed out, economic growth is always a process of “gap-filling,” that is, of supplying the missing links in the evolving chain of complementary inputs to production. Especially in a developed and well functioning economy, one with what I like to call market-supporting institutions (Langlois 2003), such gap-filling can often proceed in important part through the “spontaneous” action of more-or-less anonymous markets. In other times and places, notably in less-developed economies or in sectors of developed economies undergoing systemic change, gap-filling requires other forms of organization — more internalized and centrally coordinated forms.

Gap-filling is necessary because information about some inputs are unmarketable; and because private information about markets cannot always be proven and made public information. Of course, gap-filling will also be necessary where universalistic markets have not been developed, or where the inputs are, in principle, marketable but for some reason such markets have not arisen. For any given economic activity there is a minimum quantum of various inputs that must be marshaled. If less than this minimum variety is universalistically available, the entrepreneur has the job of stepping into the breach [sic] to fill the lack of marketable inputs; i.e., he must be an input-completer. (Leibenstein 1968, p. 75).

By the 1970s, economists focusing on economic history or developing countries began to suggest that one could explain organizational forms like the multinational corporation (Hymer 1970) and business groups (Leff 1978) as institutional mechanisms for gap-filling. As Leff put it, the “institution of the group is thus an intrafirm mechanism for

dealing with deficiencies in the markets for primary factors, risk, and intermediate products in the developing countries”⁸ (Leff 1978, p 667).

Let’s take a closer look at the nature of the “gaps” involved. Adam Smith tells us in the first sentence of *The Wealth of Nations* that what accounts for “the greatest improvement in the productive power of labour” is the continual subdivision of that labor (Smith 1976, I.i.1). Growth in the extent of the market makes it economical to specialize labor to tasks and tools, which increases productivity – and productivity is the real wealth of nations. As the benefits of the resulting increases in per capita output find their way into the pockets of consumers, the extent of the market expands further, leading to additional division of labor – and so on in a self-reinforcing process of organizational change and learning (Richardson 1975; Young 1928).

Although it may not have been obvious in the eighteenth century, the division of labor actually increases, or at least changes, the problem of economic coordination. In a world of undivided labor, what we may think of as crafts production, each worker undertakes multiple stages of production. In principle, a gunsmith, for example, would make all parts of a rifle: lock, stock, and barrel. From the standpoint of transaction costs, coordination is cheap in this world, since each worker can easily make adjustments between stages all under his or her control. With greater extent of the market, it begins to pay to assign workers full-time to a smaller subsets of tasks. This yields efficiencies, many of which Smith noted. As a pure organizational innovation (that is, holding technology constant), the division of labor is actually capital saving as well as labor

⁸ I should note that Leff defines business groups as excluding family-owned pyramids, but clearly his

saving (Leijonhufvud 1986). But coordination between stages of production has now become more difficult (Becker and Murphy 1992) — and, arguably, more urgent, since workers under the division of labor are no longer substitutes for one another but *complements*: if one artisanal gunsmith stops working, fewer rifles get made; but if an operative responsible for an entire stage of production stops working, *no* rifles get made (Leijonhufvud 1986).

It is difficult to imagine the division of labor without also imagining a coextensive *division of knowledge* (Hayek 1937). This implies that, in contrast to the implicit and often explicit assumptions of comparative-institutional analysis, knowledge about how to operate within the chain of production — how to fill gaps — must necessarily be bounded and local (Langlois and Foss 1999). The capabilities of economic actors must necessarily be limited. As George Richardson observed, what determines the limits of the “knowledge, experience, and skills” of economic actors is the degree to which the activities they undertake are *similar* (Richardson 1972). Shaping a wooden gunstock and rifling a gun barrel are complementary activities in the production of firearms, but they require quite different sets of tools and techniques. It is quite natural, then, that economic actors would find it less costly to take on activities similar to those they already undertake. A woodworker might make a variety of unrelated products from wood, a metalworker a variety of unrelated metal goods. Edith Penrose makes a version of this idea the centerpiece of her theory of the growth of the firm (Penrose 1959). In her account, production requires *resources* of various kinds, and these invariably come in

arguments apply *a fortiori* to groups under a broader definition.

lumpy bundles. Firms take advantage of the nonconvexities involved by integrating into new activities to which their resources are applicable, thus spreading fixed costs over more units. For example, at the turn of the twentieth century, meatpackers Armour and Swift moved into production of byproducts like fertilizer, leather, soap and glue (Chandler 1990, p. 168), thus taking advantage of the resources they had built up in the processing of animals for meat.

But whereas similarity can generate excess resources, complementarity can create resource bottlenecks. In order to take advantage of capabilities and resources in excess capacity, the entrepreneur must typically invest in *new* complementary resources (Teece 1986), and only by accident would these resources also be similar. In other words, in order to take advantage of excess resources, the entrepreneur may be required to fill gaps. If necessary complementary resources (or the products of those resources) are not cheaply available on markets — for any of a variety of reasons we will consider presently — the entrepreneur may be forced into integrating vertically even though his or her capabilities are ill adapted to the new activities (Silver 1984).

In Penrose's theory, the processes of similarity and complementarity coevolve: integration into similar activities creates the need for dissimilar complementary activities; the filling of those needs in turn creates new capabilities and resources, which also come in lumpy bundles; and the process continues. For example, the American meatpackers had to invest in new distribution facilities and various kinds of new and unrelated production facilities in order to take proper advantage of the byproducts of meatpacking

and the capabilities they had acquired in the distribution of refrigerated foodstuffs.⁹ Not surprisingly, the same dynamic is arguably at work in business groups, especially those in developing countries. Kim (2010) cites Koo Cha-Kyung, a former chairman of the LG Group.

My father and I started a cosmetic cream factory in the late 1940s. At the time, no company could supply us with plastic caps of adequate quality for cream jars, so we had to start a plastics business. Plastic caps alone were not sufficient to run the plastic molding plant, so we added combs, toothbrushes, and soap boxes. This plastics business also led us to manufacture electric fan blades and telephone cases, which in turn led us to manufacture electrical and electronic products and telecommunication equipment. The plastics business also took us into oil refining, which needed a tanker shipping company. The oil refining company alone was paying an insurance premium amounting to more than half the total revenue of the then largest insurance company in Korea. Thus, an insurance company was started. This natural step-by-step evolution through related businesses resulted in the Lucky-Goldstar group as we see it today. (Aguilar and Cho 1985, p. 3.)

Notice that the “natural step-by-step evolution through related businesses” involved both spreading excess resources over similar activities and calling forth dissimilar complementary activities.

⁹ “To market the by-products of the packing plants, they built large, separate distributing organizations for fertilizer and leather, and they formed smaller organizations to distribute glue, materials derived from animal fat (including soap, oleo oil, and stearin), and chemical and medicinal products. Indeed, by 1900 Armour and Swift had become two of the ‘Big Five’ in the American fertilizer industry, as well as the two largest American leather producers; Armour, too, was one of the major makers of glue and abrasives. And just as important, these companies used their refrigerated transportation, storage, and branch office facilities to distribute butter, eggs, poultry, and fruit, while Armour soon became the country’s largest marketer of butter. To obtain such produce the company invested in a large buying organization that had its own traffic division and its own sales force and delivery networks” (Chandler 1990, p. 168).

22.4. FIRMS, MARKETS, AND INSTITUTIONS.

Penrose provides us with a theory of the growth of the firm. But the dynamic of similarity and complementarity she depicts is more than that: it is arguably a theory of economic development more generally. Economic historians, especially those of what we might call the Stanford School (David 1975, 1990; Rosenberg 1976), have long stressed the importance of such complementarities for the pace and direction of technological change and economic growth. Even earlier, the Swedish economist Erik Dahmén (1970; 1988) wrote about complementarities and gap-filling in the context of what he called *development blocks*.¹⁰ And, as Morck (Morck and Nakamura 2007; 2010) reminds us, the Austrian economist Rosenstein-Rodan (1943) saw the coordination of economic development across sectors as the key to economic growth, arguing for a *big push* in which governments would orchestrate investment in and coordination among sectors.¹¹ It is certainly correct to say that firms – and specifically business groups – exist (in part at least) in order to solve the problems of coordinating complementarities in a growing economy. But that doesn't explain why and when other institutional structures like markets or multidivisional firms arise to solve the same kinds of problems.¹²

A satisfying explanation, I argue, will have to be a contingent one, an explanation that takes into account the facts on the ground of markets and institutions. With only a

¹⁰ Dahmén (1970) was first published in Swedish in 1950.

¹¹ See also Murphy, Shleifer, and Vishny (1989).

¹² As for governments: Morck (2010) argues persuasively that, contra Rosenstein-Rodan, governments have had a miserable track record in attempting to orchestrate “big push” development. (This is so for reasons that a different Austrian economist, F. A. Hayek (1945), might have appreciated.) For example, Japan’s “big push” did not take place until the government ceded ownership and control to the *zaibatsu* business groups (Morck and Nakamura 2007).

little oversimplification, we can think of these contingent facts as falling on three levels.

- *The level of markets.* How extensive are markets for complementary resources? How easy is it to marshal the necessary complementary capabilities (or their outputs)?
- *The level of market-supporting institutions.* How well developed are the institutional structures that help markets function well – that reduce the costs of coordinating complementary activities through relatively anonymous exchange among legally separate entities rather than through internal coordination within an organization? Such institutions would run the gamut from technological standards (Langlois and Robertson 1992) to legal and organizational innovations like double-entry bookkeeping (Rosenberg and Birdzell 1986) or the anonymous limited-liability corporation (Hansmann and Kraakman 2000).
- *The level of political institutions.* What is the character of the state, the organization with a territorial monopoly on the use of force? How well protected are property rights? In what ways does the government intervene in the economy? What is the nature and degree of corruption?

Quite obviously, these three levels are interrelated and blur into one another.¹³ Markets can be small because of political barriers to trade as well as because of geographical or technological ones. Market-supporting institutions like the Law Merchant (Milgrom et al. 1990) are also about the protection of property rights, and many of them serve or have served functions sometimes assumed by territorial governments (Greif 2006). Nonetheless, this taxonomy will be useful in organizing the explanations for business groups and their alternatives.

Paul Robertson and I (1995) have proposed a conceptual framework for thinking about vertical integration at the first of these levels. Begin with the initial conditions: how are economic capabilities in the relevant economy organized at time zero? Do those capabilities reside within the boundaries of vertically integrated entities (of whatever sort) or are they spread among distinct specialized organizations? Second, think about the effect of economic change on the nature of the complementarities in the economy and on the problems of coordination among those complementarities. For example, are the changes *systemic*, in that they entail simultaneous change in multiple stages of production? Or can change proceed in *autonomous* fashion without destabilizing existing task boundaries?¹⁴

Using this framework, we can explain, for example, the rise of the large multi-unit enterprise in the United States in the late nineteenth century. In the ante-bellum period, economic capabilities in the American economy were small scale and localized, with

¹³ This is arguably so because the institutions at all three levels – even the level of market capabilities – are made of the same stuff, namely rules of behavior (Langlois and Robertson 1995).

¹⁴ The terms *systemic* and *autonomous* are from Teece (1986).

much of economic activity coordinated through non-specialized wholesalers (Porter and Livesay 1971). After the Civil War, per capita income rose despite a flood of immigration; and the railroad, the inland waterways, and the telegraph lowered transportation and communications costs. As Chandler (1977) tells us, these forces expanded the extent of the market dramatically, and it began to pay to centralize certain stages of production that partook of economies of scale. The resulting change was systemic: in many instances the entire chain of production needed to be reorganized. Refrigerated meatpacking needed not only refrigerated rail cars but also a wholly new network of refrigerated warehouses, ice stations, and retail outlets; petroleum required consolidation of refining into larger plants and the transportation of refined products by rail; branded consumer goods like soap and cigarettes called for new high-throughput packaging and distribution facilities; and so on. These requirements typically resulted in large vertically integrated firms — multi-unit enterprises, as Chandler calls them — not because of the inherent superiority of managers in coordinating complementary activities but rather because of the (often short-run) deficiencies of markets in achieving this kind of systemic innovation and in coordinating high-throughput production. Entrepreneurs like Swift, Rockefeller, and Duke resorted to vertical integration not because of static transaction costs but because of what I like to call *dynamic transaction costs* (Langlois 1992) — the costs of *changing* the pattern of coordination among complementary stages.

Again, this kind of gap-filling explanation for vertical integration may not seem surprising to those familiar with the literature on multinationals and business groups in the developing world; but it is arguably more original (or more controversial) in the context of (American) business history, where the tools of comparative-institutional

analysis have held sway.¹⁵ Of course, in the late nineteenth century, the U. S. was a developing economy. By world-historical standards, property rights there were secure, and government-induced barriers to entrepreneurial activity were modest. But, relative to today's American economy, the nineteenth-century economy obviously lacked not only markets for a variety of newly needed complementary inputs but also the market-supporting institutions that might have encouraged the supply of those inputs in a less-integrated fashion. Indeed, my argument is that the Chandlerian corporation arose because the pace of systemic change in the structure of complementary activities was sufficiently rapid that appropriate innovation in market-supporting institutions couldn't keep up, making vertical integration a smoother and speedier alternative (Langlois 2003). In other times and places, however, market-supporting institutions have arisen as a way of coordinating complementary activities.

In the American Midwest before the coming of the railroad, as indeed throughout much of agricultural history, wheat was stored, shipped, and traded by the sack (Cronon 1991). Each sack of wheat was the product of a specific identifiable farmer, which meant that repeated trades could generate reputation effects that assured the quality of the grain in the market. At the same time, however, this mode of storage meant large transaction and transportation costs as the sacks moved by wagon and river to St. Louis or Chicago. With the coming of the railroad in the mid-nineteenth century, it became economical to store and ship wheat in bulk, using the newly invented mechanical grain elevator. This

¹⁵ In the work not only of Williamson (1985) himself but also of such top-notch economic historians as Lamoreaux, Raff and Temin (2003; 2008).

reduced transportation costs dramatically.¹⁶ But, as it necessitated mixing together the grain of many different farmers, it destroyed the system of quality control that had relied on the ability to associate wheat with particular farmers. To solve this problem, the Chicago Mercantile Exchange paid the costs of creating standardized categories for wheat and of persuading farmers and buyers to adopt those standards (Cronon 1991). Coupled with a system of inspection, standardization solved the quality-control problem and allowed wheat to continue to be traded on the market. Vertical integration between farming and grain elevators would also have solved the quality problem, but that solution would have generated even greater costs. Farming and grain transportation are dissimilar activities requiring different capabilities; more importantly, integration would have damaged the high-powered incentives (Williamson 1985) that individual ownership placed on farmers. Although vertical integration between farming and transportation (and maybe milling) would have buffered some of the many risks of agricultural production, well-developed commodities markets — which permit greater asset diversification — are arguably even better able to buffer such risks.¹⁷

So when would we expect the problems of coordinating complementary activities to be solved by the emergence of market-supporting institutions (and thus by markets, broadly understood) and when by vertical integration? This is a crucial — and, in my view, under-researched — question. Clearly, issues of cost matter, as in the grain example. Such issues include neoclassical economies of scale; Williamson-style

¹⁶ A typical large elevator of the era could simultaneously empty twelve railroad cars and load two ships at the rate of 24,000 bushels per hour (Cronon 1991, p. 113).

transaction costs; the costs of diversifying into activities requiring capabilities dissimilar from those one already possesses; and the costs of setting up and maintaining market-supporting institutions (Langlois 2006). Once again, these costs are contingent: they depend on the nature and level of capabilities and of market-supporting institutions already in place. And this suggests two related hypotheses (holding other things constant, of course).

The first is that the processes involved are likely to be path dependent and linked to the passage of time. I have already suggested that, as in the case of the multi-unit enterprise in the U. S. in the late nineteenth century, vertically integrated organization may be able to respond to system change more rapidly than more-decentralized alternatives in a world where markets are thin and relevant market-supporting institutions underdeveloped. But the reverse may be true in a world with thick markets and effective market-supporting institutions (Langlois 2003; Rajan and Zingales 2003). Moreover, we would expect that, as time passes, market-supporting institutions would eventually arise. But the nature and timing of those institutions would be affected by the earlier choice of vertically integrated structure. For example, the rise of the large multi-unit enterprise arguably biased technological change (at least initially) in directions that made internal coordination cheaper and thus reinforced the vertically integrated structure (Langlois 2003). Think about filing cabinets, carbon paper, and punched-card tabulators (Yates 2000).

¹⁷ Even today, farming in the U. S. is highly vertically disintegrated and non-corporate. In 1997, 86 per cent of all farms were family owned and farming corporations accounted for only 5.3 per cent of receipts (Allen and Lueck 2004).

The second hypothesis, which has resonances at least as far back as Gerschenkron's famous "backwardness" thesis (Gerschenkron 1962), is that the way an economy responds to the problems of coordinating economic development depends not only on its own institutions and capabilities but also on institutions and capabilities elsewhere. It depends not only on an economy's own history but on the history of other economies as well. The force of this observation is that an economy at the frontier of economic development (however we care to define that) is likely to respond to the coordination problem differently than an economy lagging behind that frontier. Specifically, an economy at the frontier is arguably more likely to rely on decentralized modes of coordination. This is so because uncertainty is greater at the frontier — uncertainty about technology, organizational form, market direction. As a result, selection pressures are high, making decentralized search a more successful strategy (Acemoglu et al. 2006; Nelson and Winter 1977). By contrast, economies further away from the frontier not only possess a less-developed array of market supporting institutions but also suffer less uncertainty about what the frontier looks like. Follower economies need only look to leading economies for guidance.¹⁸ Away from the frontier, selection pressure is less severe and cutting-edge learning less of an issue. So a more-centralized structure will have fewer disadvantages, and, indeed, many organizational alternatives may survive successfully (Langlois 1984).

Consider two examples, one from recent history and one from more distant history. The personal computer industry developed in the United States beginning in the

¹⁸ As Marx says in the preface to the first German edition of *Capital*, the "country that is more developed industrially only shows, to the less developed, the image of its own future."

late 1970s (Langlois and Robertson 1992). After a period of competition among designs, the industry adopted a dominant standard, now called the Wintel (Windows-Intel) architecture.¹⁹ This architecture encouraged extreme vertical disintegration of production. Stages of production with economies of scale, like the making of microprocessors or operating-system software, became the province of large firms, but the likes of Intel and Microsoft are far less vertically integrated than the IBM of the 1950s and 1960s. And Dell Computer, the most successful assembler of the late twentieth century, gained its advantage by explicitly taking advantage of a strategy of vertical disintegration (Baldwin and Clark 2006). As the power of microprocessors increased in the 1980s and 1990s, the personal computer came to displace the older mainframe and minicomputer firms, completely transforming the industry from a vertical model to a horizontal model (Grove 1996). Notice that this is the opposite of the Chandler story: here technological standards enabled even radical change to take place in autonomous fashion and, coupled with a high level of other market-supporting institutions, creatively destroyed a pre-existing structure of multi-unit enterprises.

Similarly, the cotton industry of Lancashire was the cutting-edge of the first Industrial Revolution. That industry grew out of the highly decentralized putting-out system, which had made Britain a world leader in woolens during the early modern period, and which had creatively destroyed the older system of guild production in cities. The mechanization of the industrial revolution, using first water and then steam power, did not destroy the decentralized structure of the industry: even though hand-powered

¹⁹ Putting aside the Apple Macintosh niche standard.

spinning and weaving gave way to factory production, those factories were by-and large specialized units (Lyons 1985).

The industry remained readily accessible to the small capitalist because of its geographical concentration within the Lancashire area, the absence of any restrictions upon entry, the increasing separation of the spinning and weaving processes, the extension of the range of products manufactured by the industry, and the growth of a wide range of external economies offered by the auxiliary industries of the region, especially through the development of specialized markets for cotton, yarn, cloth, cotton waste, machinery, and mill stores. Employers could rent land and warehouses, obtain advances from agents, brokers, and banks, and secure long credit terms from machine-makers. Above all, they could rent room, power, and even machinery through a system which long remained the palladium of the small master, first in spinning and then in weaving. (Farnie 1979, p. 210.)

This contrasts sharply with the situation in follower economies, like the U. S. and Germany, where markets were thinner and “external economies” largely absent, and thus where vertical integration prevailed to a much greater extent (Brown 1992; Temin 1988).

22.5. INTERMEDIATE TIES, PYRAMIDS, AND NATURAL STATES.

So far I have talked generally about vertical integration and disintegration, not specifically about business groups. And I have yet to engage the third level of contingent facts, political institutions. I now propose to argue that business groups and political institutions are closely related; indeed, in some of their forms, they are the same thing.

Scholars generally distinguish business groups from more loosely arranged structures like business networks. “When ownership and control are more centralized and organizational subunits enjoy limited autonomy, the commonly used term is business groups. When subunits enjoy more autonomy with respect to ownership, control, and

operations, interfirm network is the correct term. In other words, business groups are more centralized and closely held, while interfirm networks are more decentralized and loosely held” (Fruin 2008). Indeed, in some eyes, the “groupness” of a business group is orthogonal to its structure of corporate governance. Mark Granovetter (1995, p. 95) considers business groups to be “collections of firms bound together in some formal and/or informal ways, characterized by an ‘intermediate’ level of binding.” Purely anonymous market relations don’t qualify in Granovetter’s definition; but neither do American-style conglomerates, whose wholly owned divisions have little connection with one another and are but modular pieces on the financial chessboard. But a variety of governance structures, from hierarchical and structured *chaebols* on the one hand to Marshallian industrial districts (Marshall 1920, IV.x.3) on the other, would qualify as business groups in Granovetter’s sense. As in the personal computer industry in the twentieth century and the Lancashire textile industry in the nineteenth, industrial districts are interfirm networks that involve shared information and culture more than ties of ownership.²¹ In other cases, however, an industrial district might also involve patterns of overlapping ownership. The Naugatuck Valley brass industry in Western Connecticut was an industrial district in which there was significant overlapping ownership of enterprises, and this identifiable group of owners were also responsible for bringing into existence various market-supporting institutions and complementary resources such as banks and a rail link to New Haven (Everett 1997). And there can also be links among

²¹ The personal computer industry is not as localized as was the Lancashire textile industry, but Silicon Valley is clearly a hub, with nodes at places like Austin, Seattle, and Taipei.

firms not geographically clustered — with or without cross ownership — as in the much-disputed case of the Japanese *keiretsu* (Lincoln and Shimotani 2010).

Explaining the existence of business groups in Granovetter's sense is arguably easier than explaining the mantle of ownership and governance those groups take on. "Intermediate" linkages are essential to the process of gap-filling. Links among entrepreneurs, whether formal or informal, permit the sharing of information about gaps and encourage the coordination of necessary complements (Kock and Guillén 2001). For example, British merchant houses in the nineteenth century took good advantage of well-developed capital markets in Britain by floating specialized "free-standing" companies to pursue opportunities abroad; yet the success of those merchants rested fundamentally on "intermediate ties" of various sorts, both within the trading houses and with the local economy (G. Jones and Colpan 2010). "These companies were not merely perceiving opportunities for trade intermediation, but in some instances creating the trade itself. Once established in a country, they acquired and utilized local knowledge and information which reduced the costs of diversification into other activities. Knowledge and information emerge at the heart of the capabilities of these firms." (G. Jones and Wale 1998, p. 382.)

Even though business groups in the sense of "intermediate ties" can be organized in a variety of ways, there seems to be one dominant form of ownership and governance. Most often, business groups are organized as pyramids of listed and unlisted firms,

generally but not always under family control.²² This stands in contrast to the model more typical in the United States and some other Western countries, where firms tend to be freestanding and widely held, with subsidiaries that are generally unlisted and wholly owned. The multi-unit (Chandler 1977) and multi-divisional (Chandler 1990) forms that Chandler chronicles are of this latter type. But those managerial forms are in fact a relative oddity throughout the world, where the pyramidal form dominates (La Porta et al. 1999). The business groups of Korea and Taiwan are starkly different along a number of dimensions: the former are hierarchically organized, vertically integrated, and focused on exporting complete systems (like cars, white goods, or consumer electronics), whereas the latter are more permeable, less integrated, and more focused on intermediate products (Hamilton and Feenstra 1995). Yet, from the perspective of ownership, business groups in both countries fit the definition of pyramids. So do the nineteenth-century British merchant houses.

In a sense, it would seem, there is something “natural” about pyramidal groups: they seem to crop up whenever governments do not take active measures to beat them down (Morck 2010). Meir Kohn (2009) argues that, throughout most of history, the family firm has been the “natural” form of business organization. The family bond lowers monitoring costs, helps align incentives, and provides enforcement mechanisms, all of which help explain this form’s resiliency.²³ Most business groups are controlled by

²² Morck (2010) defines a group as “two or more listed firms under a common controlling shareholder, with control presumed to lie with the largest blockholder voting at least 10 per cent or 20 per cent.”

²³ Cf. our earlier discussion of farming (Allen and Lueck 2004).

families, so one might think of the pyramidal group as just an extension of the natural family firm. Yes, but there is more to the story.

North, Wallis, and Weingast (2009) have recently put forward a theory of what they call the *natural state*. This form of state is “natural” in the same sense as is the pyramidal group: it is the default form of organization. Apart from the hunter-gatherer lifestyle before the Neolithic Revolution and a few present-day open-access orders (more on which presently), the natural state has been the *only* form of territorial government throughout history. North *et al.* (2009) model the natural state not as a single-person natural monopolist in the use of force (North 1981; Olson 1993) but as a relatively stable coalition of elites who limit access to the resources of society in order to “create credible incentives to cooperate rather than fight among themselves” (2009, p. 18).

Prominent among the resources that elites seek to limit is the ability to form productive organizations. “By devising ways to support contractual organizations and then extending the privilege of forming those organizations to their members, the dominant coalition creates a way to generate and distribute rents within the coalition as well as a credible way to discipline elites because elite organizations depend on the third-party support of the coalition. The ability of elites to organize cooperative behavior under the aegis of the state enhances the elite return from society's productive resources — land, labor, capital, and organizations” (North et al. 2009, p. 20). Clearly, this fits the picture of business groups in many times and places in history.²⁴

²⁴ Khanna and Yafeh (2007, p. 352) argue that, in general, “there is substantial evidence [that] business groups in emerging markets are very often, though not always, formed with government

The coalitional function of business groups is not, of course, incompatible with their gap-filling function. Although the former speaks to governance issues whereas the latter speaks more directly to issues of vertical integration, the governance dimension and the gap-filling dimension are linked, for one crucial kind of gap is the absence of transactional rules and procedures. As North *et al.* note, “most organizations have their own internal institutional structure: the rules, norms, and shared beliefs that influence the way people behave within the organization” (North et al. 2009, p. 16). For example, in pre-Meiji Japan, Mitsui and Sumitomo — favored business partners of the Shogunate — were forced to create their own institutional rules. “Both families managed without money and modern economic institutions, like corporation or contract law. Consequently, both families developed *house rules* – constitutions dictating how business should be done; profits calculated, allocated, and disbursed; and power passed from generation to generation. House rules assigned key decisions to *family councils* – parliaments representing clans according to precise voting formulae. Thus, in an environment without ambient business law, merchant houses formulated their own laws and, as far as we can tell, adhered to them rigidly. Private legal systems served both merchant houses well, making their behavior predictable and their promises credible.” (Morck and Nakamura 2007, p. 10.)

Natural states or limited-access orders stand in contrast to *open-access orders*. In the latter, which characterize the polities today in places like North America, much of

support. But as the groups evolve and (some of) the countries develop, the relations between groups and governments become far more complex so that there is considerable variation in this dimension across groups and countries.” However, all of their examples of cases in which

Europe, and Japan, the allocation of resources is not restricted to elites but is open to the majority of the population. The key defining dimension of an open-access order is anonymity or impersonality. Whereas in a natural state the allocation of resources depends on status and identity — which family group you belong to, for example — in an open-access order all who meet specified abstract criteria participate in resource allocation and are permitted to form organizations. This creates an incentive for the formation of more complex contractual organizations, which do not rely (solely) on coalitional dynamics for enforcement but also have recourse to abstract third-party rules and procedures (North et al. 2009, pp. 22-23). Open-access orders thus have greater scope for the introduction of market-supporting institutions, and we would expect to see greater use of such institutions to coordinate complementary activities in such societies.

Nonetheless, the pyramidal governance structure of the business group continues to manifest itself even in modern open-access societies like Canada, Israel, or Sweden. Indeed, Morck (2005) argues that but for the taxation of intercorporate dividends and other government policies, pyramidal business groups would be important in the U. S. as well. Why do pyramids persist in open-access societies?

One much-discussed possibility is that they are a vehicle for unproductive rent seeking. Majority stakeholders can transfer resources among units of the group in ways that benefit themselves at the expense of minority stockholders, a process called *tunneling* (Johnson et al. 2000). The problem is that empirical evidence of the phenomenon is at best mixed (Khanna and Yafeh 2007). Moreover, Morck (2010) insists

governments have tried to harm or discourage business groups all involve dramatic changes in

that, even if tunneling does take place, potential minority investors are aware of the possibility and pay a discounted price for the stock as a result. Now, such a discount does not by itself imply that there is no inefficiency: it could represent an inefficient equilibrium.²⁵ In such a case, however, we would expect to see poorer performance among units of business groups than among freestanding firms; and the empirical evidence of this is at best mixed, ambiguous, and beset by problems of endogeneity (Khanna and Yafeh 2007; Masulis et al. 2009). This has led some authors to wonder whether the explanation for pyramids in open-access societies might actually lie outside of the economic (Morck 2010, pp.). Writing in the context of Israel, for example, Kosenko and Yafeh (2010, p.) argue that, “in a developed economy, where external (financial and other) markets are developed, business groups have no advantage in allocating resources internally. The reasons for their existence appear to have more to do with prestige, political ties, family considerations and factors other than economic efficiency.”

There may yet be another explanation. Even in developed open-access societies, pyramidal business groups may exist because they play a gap-filling role. In this case, the issue is not vertical integration but governance. In developed economies – which increasingly means one integrated global economy – markets are relatively thick and market-supporting institutions relatively abundant, making it possible to coordinate complementary activities in a decentralized way. But there are still gaps: new products, new processes, new ways of organizing, new profit opportunities to seize.

the coalition of elites or involve open-access orders like the U. S.

²⁵ Analogous, for example, to the case of workers in Alchian-and-Demsetz’s (1972) theory of joint production, who find themselves in a high-shirking low-compensation equilibrium (we pretend to

There is a durable thread in the literature of organization, running at least from Frank Knight (1921) through Oliver Hart (1989), that associates residual rights of control with innovation and uncertainty. In a world of uncertainty and new opportunities, it is impossible to specify all future contingencies in a contract. Residual rights of control accord their holders the ability to decide and act within the gaps of inevitable contract incompleteness – the ability, in Knight’s terms, to exercise entrepreneurial *judgment* (Langlois and Cosgel 1993). Thus by retaining significant control in enterprises at lower stages of the pyramid, the owners of a business group can exercise this kind of judgment. This is a function entirely analogous to that of venture capitalists²⁶ (Gompers and Lerner 2004). Significantly, venture capitalism as an institution flourishes in those economies like the U. S. where pyramids have been suppressed or are otherwise not the norm. It is an interesting question whether the American system (suppressed pyramids + venture capital) is a superior institutional structure to that of the pyramids found abundantly elsewhere in the world, especially along the dimension of innovation.

22.6 CONCLUSIONS

All growing economies are “developing” economies: they all face the problem of coordinating an array of complementary activities in a world in which knowledge is limited and local. Such coordination is a matter of “gap filling.” In economies where markets are relatively thick and institutions (both political institutions and what I call

work and they pretend to pay us, as the old Soviet saying goes) but would prefer to be in a high-effort high-compensation equilibrium.

²⁶ The parent firms in a pyramid “hold significant control rights in the junior firm so as to offset the potentially large moral hazard problem associated with being an outside investor with limited minority shareholder protections. This is the same rationale for giving superior control rights to venture capitalists” (Masulis et al. 2009, pp. 5-6).

market-supporting institutions) are firmly in place, coordination can take place through relatively anonymous markets and relatively autonomous firms. In “less developed” economies, where markets are relatively thinner and institutions weak, coordination is often more cheaply undertaken within the boundaries of business groups organized as financial pyramids, often under family control. These organizations are intimately linked to the coalition of territorial rulers that North and his coauthors (2009) call a natural state; and, indeed, such business groups are typically themselves *examples* of a natural state, in that they represent a self-enforcing coalition with its own rules, norms, and mechanisms of enforcement.

But even in “developed” economies, novelty and change creates the sorts of gaps that call for business groups, including less-formal sets of “intermediate” relationships, as, for example, in geographic (or, increasingly, “virtual”) industrial districts. In this sense, the economics of organization generally can learn from the literature on business groups outside the developed world. The problem of gap-filling in highly developed economies differs from that in less-developed economies because the path ahead is cloudier, which suggests that more-decentralized organizational structures may be more successful at the cutting-edge of technology. But pyramidal business groups persist in highly developed economies with strong institutions of third-party enforcement and investor protection. The reasons for this, I suggest, have to do with the function of residual rights of control in governance, which permit adaptation to new possibilities and the exercise of entrepreneurial judgment.

REFERENCES.

- Acemoglu, D., Aghion, P., and Zilibotti, F. (2006), 'Distance to Frontier, Selection, and Economic Growth', *Journal of the European Economic Association*, 4 (1), 37-74.
- Aguilar, F. J. and Cho, D. S. (1985), 'Gold Star Co. Ltd', *Case no. 9-385-264* (Boston: Harvard Business School Press).
- Alchian, A. and Demsetz, H. (1972), 'Production, Information Costs, and Economic Organization', *American Economic Review*, 62 (5), 772-95.
- Allen, D. W. and Lueck, D. (2004), *The Nature of the Farm: Contracts, Risk, and Organization in Agriculture* (Cambridge: The MIT Press).
- Baldwin, C. Y. and Clark, K. B. (2006), 'Architectural Innovation and Dynamic Competition: The Smaller "Footprint" Strategy', *Harvard Business School Working Paper*, No. 07-014.
- Becker, G. S. and Murphy, K. M. (1992), 'The Division of Labor, Coordination Costs, and Knowledge', *The Quarterly Journal of Economics*, 107 (4), 1137-60.
- Brown, J. C. (1992), 'Market Organization, Protection, and Vertical Integration: German Cotton Textiles before 1914', *The Journal of Economic History*, 52 (2), 339-51.
- Chandler, A. D., Jr. (1977), *The Visible Hand: the Managerial Revolution in American Business* (Cambridge: The Belknap Press).
- (1990), *Scale and Scope: the Dynamics of Industrial Capitalism* (Cambridge: The Belknap Press).
- (1992), 'Organizational Capabilities and the Economic History of the Industrial Enterprise', *The Journal of Economic Perspectives*, 6 (3), 79-100.
- Coase, R. H. (1937), 'The Nature of the Firm', *Economica* (N.S.) 4, 386-405.
- (1964), 'The Regulated Industries -- Discussion', *The American Economic Review*, 54 (3), 194-97.
- Cronon, W. (1991), *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton).
- Dahmén, E. (1970), *Entrepreneurial Activity and the Development of Swedish Industry, 1919-1939*, trans. Axel Leijonhufvud (Homewood, IL: Richard D. Irwin).
- (1988), 'Development Blocks' in Industrial Economics', *Scandinavian Economic History Review*, 36 (1), 3-14.

- David, P. A. (1975), *Technical Choice Innovation and Economic Growth: Essays on American and British Experience in the Nineteenth Century* (New York: Cambridge University Press).
- (1990), 'The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox', *The American Economic Review*, 80 (2), 355-61.
- Demsetz, H. (1969), 'Information and Efficiency: Another Viewpoint', *Journal of Law and Economics*, 12 (1), 1-22.
- Everett, M. J. (1997), 'External Economies and Inertia: The Rise and Decline of the Naugatuck Valley Brass Industry', Ph. D. Dissertation (The University of Connecticut).
- Farnie, D. A. (1979), *The English Cotton Industry and the World Market, 1815-1896* (Oxford: Clarendon Press).
- Fruin, W. M. (2008), 'Business Groups and Interfirm Networks', in Geoffrey Jones and Jonathan Zeitlin (eds.), *The Oxford Handbook of Business Groups* (Oxford: Oxford University Press).
- Gerschenkron, A. (1962), *Economic Backwardness in Historical Perspective: A Book of Essays* (Cambridge: The Belknap Press of Harvard University Press).
- Gompers, P. and Lerner, J. (2004), *The Venture Capital Cycle* (2nd Edition edn.; Cambridge: The MIT Press).
- Granovetter, M. (1995), 'Coase revisited: business groups in the modern economy', *Industrial and Corporate Change*, 4 (1), 93-130.
- Greif, A. (2006), *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade* (New York: Cambridge University Press).
- Grove, A. S. (1996), *Only the paranoid survive* (New York: Currency Doubleday).
- Hamilton, G. G. and Feenstra, R. C. (1995), 'Varieties of hierarchies and markets: an introduction', *Industrial and Corporate Change*, 4 (1), 55-91.
- Hansmann, H. and Kraakman, R. H. (2000), 'Organization Law as Asset Partitioning', *European Economic Review*, 44 (4-6), 807-17.
- Hart, O. (1989), 'An Economist's Perspective on the Theory of the Firm', *Columbia Law Review*, 89 (7), 1757-74.
- Hayek, F. A. (1937), 'Economics and Knowledge', *Economica*, 4 (13), 33-54.
- (1945), 'The Use of Knowledge in Society', *The American Economic Review*, 35 (4), 519-30.

- (1967), *Studies in Philosophy, Politics and Economics* (Chicago: University of Chicago Press).
- Hymer, S. (1970), 'The Efficiency (Contradictions) of Multinational Corporations', *The American Economic Review*, 60 (2), 441-48.
- Johnson, S. R., et al. (2000), 'Tunneling', *American Economic Review*, 90 (2), 22-27.
- Jones, E. L. (2006), *Cultures Merging: A Historical and Economic Critique of Culture* (Princeton: Princeton University Press).
- Jones, G. and Wale, J. (1998), 'Merchants as Business Groups: British Trading Companies in Asia before 1945', *The Business History Review*, 72 (3), 367-408.
- Jones, G. and Khanna, T. (2006), 'Bringing history (back) into international business', *Journal of International Business Studies*, 37 (4), 453-68.
- Jones, G. and Colpan, A. M. (2010), 'Business groups in historical perspective', in Asli M. Colpan, Takashi Hikino, and James R. Lincoln (eds.), *Oxford Handbook of Business Groups* (Oxford: Oxford University Press).
- Khanna, T. and Yafeh, Y. (2007), 'Business Groups in Emerging Markets: Paragons or Parasites?' *Journal of Economic Literature*, 45 (2), 331-72.
- Kim, H. (2010), 'The Rise, Fall, and Reemergence of Korean Business Groups', in Asli M. Colpan, Takashi Hikino, and James R. Lincoln (eds.), *Oxford Handbook of Business Groups* (Oxford: Oxford University Press).
- Klein, P. G. (2000), 'New Institutional Economics', in Boudewijn Bouckaert and Gerrit De Geest (eds.), *Encyclopedia of Law and Economics* (Cheltenham: Edward Elgar), 456-89.
- Knight, F. H. (1921), *Risk, Uncertainty, and Profit* (Boston: Houghton-Mifflin).
- Kock, C. and Guillén, M. F. (2001), 'Strategy and Structure in Developing Countries: Business Groups as an Evolutionary Response to Opportunities for Unrelated Diversification', *Industrial and Corporate Change*, 10 (1), 77-113.
- Kohn, M. (2009), *The Origins of Western Economic Success: Commerce, Finance, and Government in Pre-Industrial Europe* (Hanover: Dartmouth College, Unpublished Manuscript. Available at: <http://www.dartmouth.edu/~mkohn/>).

- Kosenko, K. and Yafeh, Y. (2010), 'Business Groups in Israel', in Asli M. Colpan, Takashi Hikino, and James R. Lincoln (eds.), *Oxford Handbook of Business Groups* (Oxford: Oxford University Press).
- La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. (1999), 'Corporate Ownership around the World', *The Journal of Finance*, 54 (2), 471-517
- Lamoreaux, N. R., Raff, D. M. G., and Temin, P. (2003), 'Beyond Markets and Hierarchies: Toward a New Synthesis of American Business History', *American Historical Review*, 108 (2), 404-33.
- (2008), 'Business History and Economic Theory', in Geoffrey Jones and Jonathan Zeitlin (eds.), *Oxford Handbook of Business History* (Oxford: Oxford University Press).
- Langlois, R. N. (1984), 'Internal Organization in a Dynamic Context: Some Theoretical Considerations', in Meheroo Jussawalla and Helene Ebenfield (eds.), *Communication and Information Economics: New Perspectives* (Amsterdam: North-Holland), 23-49.
- (1986), 'The New Institutional Economics: An Introductory Essay', in Richard N. Langlois (ed.), *Economics as a Process: Essays in the New Institutional Economics* (New York: Cambridge University Press), 1-25.
- (1992), 'Transaction Cost Economics in Real Time', *Industrial and Corporate Change*, 1 (1), 99-127.
- (2003), 'The vanishing hand: the changing dynamics of industrial capitalism', *Industrial and Corporate Change*, 12 (2), 351-85.
- (2004), 'Chandler in a larger frame: Markets, transaction costs, and organizational form in history', *Enterprise & Society*, 5 (3), 355-75.
- (2006), 'The Secret Life of Mundane Transaction Costs', *Organization Studies*, 27 (9), 1389-410.
- (2007), *The Dynamics of Industrial Capitalism: Schumpeter, Chandler, and the New Economy*. (The Graz Schumpeter Lectures; London: Routledge).
- Langlois, R. N. and Robertson, P. L. (1992), 'Networks and Innovation in a Modular System: Lessons from the Microcomputer and Stereo Component Industries', *Research Policy*, 21 (4), 297-313
- Langlois, R. N. and Cosgel, M. M. (1993), 'Frank Knight on Risk, Uncertainty, and the Firm: A New Interpretation', *Economic Inquiry* 31, 456-65

- Langlois, R. N. and Robertson, P. L. (1995), *Firms, markets, and economic change: a dynamic theory of business institutions* (London: Routledge).
- Langlois, R. N. and Foss, N. J. (1999), 'Capabilities and governance: The rebirth of production in the theory of economic organization', *Kyklos*, 52 (2), 201-18.
- Leff, N. H. (1978), 'Industrial Organization and Entrepreneurship in the Developing Countries: The Economic Groups', *Economic Development and Cultural Change*, 26 (4), 661-75.
- Leibenstein, H. (1968), 'Entrepreneurship and Development', *The American Economic Review*, 58 (2), 72-83.
- Leijonhufvud, A. (1986), 'Capitalism and the Factory System', in Richard N. Langlois (ed.), *Economics as a Process: Essays in the New Institutional Economics* (New York: Cambridge University Press), 203-23.
- Lincoln, J. R. and Shimotani, M. (2010), 'Whither the keiretsu, Japan's business networks? How were they structured? What did they do? Why are they gone?' in Asli M. Colpan, Takashi Hikino, and James R. Lincoln (eds.), *Oxford Handbook of Business Groups* (Oxford: Oxford University Press).
- Lyons, J. S. (1985), 'Vertical Integration in the British Cotton Industry, 1825-1850: A Revision', *The Journal of Economic History*, 45 (2), 419-25.
- Marshall, A. (1920), *Principles of Economics* (8th edn.; London: Macmillan and Co.).
- Masulis, R. W., Pham, P. K., and Zein, J. (2009), 'Pyramids: Empirical Evidence on the Costs and Benefits of Family Business Groups around the World', *Working Paper*. Available at: , <<http://ssrn.com/paper=1284499>>, accessed 11 July 2009.
- Milgrom, P., North, D. C., and Weingast, B. R. (1990), 'The Role of Institutions in the Revival of Trade: the Law Merchant, Private Judges, and the Champagne Fairs', *Economics and Politics*, 2, 1-23.
- Morck, R. (2005), 'How to Eliminate Pyramidal Business Groups: The Double Taxation of Intercompany Dividends and Other Incisive Uses of Tax Policy', in James M. Poterba (ed.), *Tax Policy and the Economy* (Cambridge: MIT Press), 135-79.
- (2010), 'The Riddle of the Great Pyramids', in Asli M. Colpan, Takashi Hikino, and James R. Lincoln (eds.), *Oxford Handbook of Business Groups* (Oxford: Oxford University Press).

- Morck, R. and Nakamura, M. (2007), 'Business Groups and the Big Push: Meiji Japan's Mass Privatization and Subsequent Growth', *National Bureau of Economic Research Working Paper Series*, No. 13171.
- Murphy, K. M., Shleifer, A., and Vishny, R. W. (1989), 'Industrialization and the Big Push', *The Journal of Political Economy*, 97 (5), 1003-26.
- Nelson, R. R. and Winter, S. G. (1977), 'In Search of Useful Theory of Innovation', *Research Policy*, 5, 36-76.
- North, D. C. (1981), *Structure and Change in Economic History* (New York: Norton).
- (1990), *Institutions, Institutional Change and Economic Performance* (New York: Cambridge University Press).
- North, D. C., Wallis, J. J., and Weingast, B. R. (2009), *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History* (New York: Cambridge University Press.).
- Olson, M. (1993), 'Dictatorship, Democracy, and Development', *The American Political Science Review*, 87 (3), 567-76.
- Penrose, E. T. (1959), *The Theory of the Growth of the Firm* (Oxford: Basil Blackwell).
- Porter, G. and Livesay, H. C. (1971), *Merchants and Manufacturers: Studies in the Changing Structure of Nineteenth-Century Marketing* (Baltimore: Johns Hopkins University Press).
- Rajan, R. and Zingales, L. (2003), *Saving capitalism from the capitalists : unleashing the power of financial markets to create wealth and spread opportunity* (New York: Crown Business).
- Richardson, G. B. (1972), 'The Organisation of Industry', *The Economic Journal*, 82 (327), 883-96.
- (1975), 'Adam Smith on Competition and Increasing Returns', in A. S. Skinner and T. Wilson (ed.), *Essays on Adam Smith* (Oxford: Clarendon Press), 350-60.
- Rosenberg, N. (1976), *Perspectives on Technology* (New York: Cambridge University Press).
- Rosenberg, N. and Birdzell, L. E., Jr. (1986), *How the West Grew Rich* (New York: Basic Books).
- Rosenstein-Rodan, P. N. (1943), 'Problems of Industrialisation of Eastern and South-Eastern Europe', *The Economic Journal*, 53 (210/211), 202-11.
- Silver, M. (1984), *Enterprise and the Scope of the Firm* (London: Martin Robertson).

- Smith, A. (1976), *An Enquiry into the Nature and Causes of the Wealth of Nations* (Glasgow edn.; Oxford: Clarendon Press).
- Teece, D. J. (1986), 'Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing, and Public Policy', *Research Policy*, 15 (6), 285-305.
- Temin, P. (1988), 'Product Quality and Vertical Integration in the Early Cotton Textile Industry', *The Journal of Economic History*, 48 (4), 891-907.
- Williamson, O. E. (1975), *Markets and Hierarchies: Analysis and Antitrust Implications* (New York: The Free Press).
- (1985), *The Economic Institutions of Capitalism* (New York: The Free Press).
- Yates, J. (2000), 'Business Use of Information and Technology during the Industrial Age', in Alfred D. Chandler Jr. and James W. Cortada (eds.), *A Nation Transformed by Information: How Information Has Shaped the United States from Colonial Times to the Present* (New York: Oxford University Press), 107-35.
- Young, A. A. (1928), 'Increasing Returns and Economic Progress', *The Economic Journal*, 38 (152), 527-42.