The Corporation and the Twentieth Century

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A note to the reader.

This is not really a paper. It is the beginnings of a book project. So consider this a kind of proposal, with early versions of early chapters. I have made a stab at a provocative thesis, but it is merely sketched. I consider even the thesis itself provisional and subject to change as I sift more carefully and completely through the evidence.

Clearly, I am very much in need of your comments, suggestions, and objections. Am I on the right track? What literature have I missed?

Table of (mostly proposed) content

Introduction.

From the vantage point of today, we can see that the twentieth century was an odd period of history. The span from 1914 to 1973 or so was a break from a clear trend of globalization and market integration that began at least as far back as the 1820s[1] (O'Rourke and Williamson 2002). The period 1914-1973 was also the heyday in the United States of the large multi-unit enterprise chronicled and celebrated by Alfred Chandler (1977). Perhaps this is no coincidence.

In earlier work (Langlois 2003b, 2007) I attempted to paint a picture of the rise and decline of the Chandlerian firm in a style faithful to Chandler's original sketch. As a result, I drew factors like technology and extent of the market in the foreground and left the role of institutions, especially regulatory institutions, as details in the shadows. Other writers, including those in the so-called varieties-of-capitalism literature (Hall and Soskice 2001) and in the literature on the political origins of corporate governance (Roe 2003), have theorized about the effects of institutions on corporate form. In this essay I join that conversation. I look more carefully at the institutional changes in the United States during the period 1914-1973, and I deploy evidence from economic and business history in an attempt to sort out the contribution of those institutional changes to the rise and decline of the Chandlerian corporation – and, perhaps, vice-versa.

[1] Deirdre McCloskey (2006, p. 202) refers to the period 1914-1989 as the "Great European Civil War." For reasons that will become clear as we go along, I prefer to think of the 1970s and the fall of Bretton Woods as a more appropriate inflection. Others have referred to the two world wars and the economic events in between as the "Second Thirty Years' War" (Temin and Vines 2013, p. 55).

Institutions and the corporation.

Although it may sound odd to say this, Alfred Chandler's analysis of the rise of the multi-unit enterprise is largely a-institutional. It is not that Chandler *ignores* institutions; rather, he claims affirmatively that institutions are not fundamental to the story he is telling.

This is an odd thing to say since, in one sense, Chandler's work is very much institutional. He revolutionized business history by pulling its focus back from antiquarian accounts of individual firms to encompass the history of the forms under which business had been conducted (Chandler 1971). The multi-unit managerial corporation is one such form; and whatever one's position in the debate about whether "organizations" count as institutions, the *form* of the multi-unit enterprise, as distinct from any particular instantiation of that form, is clearly an institution.[2] Nonetheless, Chandler explains the nature and rise of that form almost exclusively in terms of economic parameters (like technology, size of markets, and transportation costs) and the internal logic of organization itself. Institutions in the larger sense of legal and political arrangements are not entirely absent, as I will argue; but they remain in the background. "The modern diversified enterprise represents a calculated, rational response of technically trained professional managers to the needs and opportunities of changing technologies and markets. It is much less the product of ambitious and able individual entrepreneurs or of governmental policies" (Chandler 1969, p. 279).

[2] Hodgson (2006, p. 2) defines institutions as "systems of established and prevalent social rules that structure social interactions."

Chandler's notion of institutional history derives from Max Weber, whom he absorbed via Talcott Parsons (Chandler 1971; McCraw 1988). Weber's famous account of bureaucracy is clearly the font of Chandler's understanding of the essence of managerial capitalism. "Administrative coordination," carried out by trained professional managers, by what are clearly bureaucrats rather than Schumpeterian entrepreneurs, is not a contingent solution to the problems of a particular time and place. Administrative coordination is *the* rational method for organizing high-throughput mass production.

> Although administrative coordination has been a basic function in the modernization of the American economy, economists have given it little attention. Many have remained satisfied with Adam Smith's dictum that the division of labor reflects the extent of the market. Like George Stigler, they see the natural response to improved technology and markets as one of increasing specialization in the activities of the enterprise and vertical disintegration in the industries in which these enterprises operate. Such an analysis has historical validity for the years before 1850 but has little relevance to much of the economy after the completion of the transportation and communication infrastructure. Besides ignoring the historical experience, such a view fails to consider the fact that *increasing specialization must, almost by definition, call for more carefully planned coordination* if volume output demanded by mass markets is to be achieved (Chandler 1977, p. 490, emphasis added).

Chandler's *magnum opus* was published in 1977, at what turned out to be the dawn dimly breaking of a new era of liberalization, globalization, and technological change. If the hallmark of the late nineteenth century was the rise of the large multi-unit enterprise, the hallmark of the late twentieth century was the undoing of that organizational form. The corporation in all its guises came under intense pressure; many corporations disappeared or crumbled into more specialized fragments. Of course, the late twentieth century also saw the rise of "large" corporations, but these were large in terms of output or value, not large in the sense of Coase (1937). Corporation like Apple,

Dell, Intel, and Microsoft grew from tiny start-ups and remained relatively specialized even as their market cap exploded. Vertical integration is far from dead; but the multi-unit enterprise has lost its pre-eminence and has receded into place among a wider variety of organizational forms. One could even say that, at the turn of the millennium, growth in markets was leading to a progressive division and specialization of industries (Young 1928) not entirely unlike that envisaged by Smith and Stigler.

In "The Vanishing Hand" (2003b) and follow-on work (Langlois 2007), I attempted to understand this phenomenon from within what was essentially a Chandlerian framework. Like Chandler, I tried to explain observed changes in organizational form in terms of changes in economic parameters (like technology, size of markets, and transportation costs) and in terms of the internal logic of organization. The puzzle, of course, is that at the end of the nineteenth century larger markets and reduced transportation and communication costs led to *increased* vertical integration, whereas at the end of the twentieth century even larger markets and much lower transportation and communication costs were leading to *less* vertical integration. My solution was to remove the Weberian core of Chandler's account and replace it with the Smithian one. A growing extent of the market always leads to the division and specialization of industries; but that process works itself out only over time.[3] In the short run, "markets," and market-supporting institutions like technical standards or contract law, cannot adapt as quickly as can administrative coordination within a vertically integrated structure. Another way to

[3] This does not mean just that labor is becoming more specialized. Part of this Smithian process may involve changes in the specialization of machines, which may become *less* specialized, and that may in turn make labor less specialized (Ames and Rosenberg 1965; Langlois 2003a). But the effect of this possibility is to change what are included in the "tasks." In the large, tasks continue to become increasingly specialized.

put it is that vertical integration can sometimes overcome the dynamic transaction costs of economic change (Langlois 1992). In this account, unlike that of Chandler, administrative coordination within vertically integrated structures is not inherently superior to "market" coordination in all times and places, even for high-throughput production. As markets mature and market-supporting institutions develop, we would expect to see vertical integration play an increasingly small role in coordinating the complex matrix of production.

Notice that, like Chandler's account, my account makes no mention of larger institutional forces like government policy. I do talk about "market-supporting institutions," and in principle these could be governmental institutions of some sort. But I never really expand on the concept. My principal example is technological standardization.[4] In the end, I tended to think of market-supporting institutions as residing at some kind of "meso" level between organizational form and political institutions. Is this a problem? In comparing the effect of the turn-of-the twentieth-century globalization (the visible hand) with the effect of turn-of-the-twenty-first-century globalization (the vanishing hand), economic factors seem to take center stage: growth in the extent of the market, attendant on growing income and lower transportation and communications costs, can carry the explanatory weight. But even here, political institutions lie in the background; liberalization and globalization presuppose them. There is no such thing as a "free market" independent of legal and political institutions. Markets depend on the affirmative presence of institutions like property rights and

[4] As in the case of standards for Midwestern grain in the nineteenth century (Cronon 1991), which enabled the mass distribution of grain by means of organized commodities markets rather than through any kind of internal administrative coordination.

contract law as much as they thrive in the *absence* of a great many other political institutions (like tariffs, capital controls, or immigration laws) that would hamper trade.

The role of these larger institutions becomes even more critical when we consider the middle of the twentieth century, a period during which there were political institutions aplenty. Recall my argument: Chandlerian vertical integration arose as a mechanism for quickly making the many systemic changes called for by the economic forces of the late nineteenth century. As markets and market-supporting institutions "caught up" in the late twentieth century, high levels of vertical integration were no longer needed. But what exactly was happening in the middle of the twentieth century? Calendar time was elapsing, but markets and market-supporting institutions didn't seem to be catching up. Indeed, the 1950s and 60s were arguably the high point of the Chandlerian corporation. By well into the middle of the century, forward integration among manufacturers seemed to be increasing rather than decreasing (Livesay and Porter 1969). And at the beginning of the 1960s, the large corporations of the early century not only continued to dominate the *Fortune* 500 but actually seemed to be more fully entrenched than ever (Collins and Preston 1961). Why? The only way to answer this question is to look more carefully at political (and perhaps other social) institutions in mid-century to see how they affected the institution of the Chandlerian corporation, either directly, or indirectly through their effects on economic parameters like market size and trade costs.

Administrative coordination.

Before we examine the hypotheses and evidence, however, we need to take what may seem to be a detour. We need to be clear about what it is we are trying to explain.

Consider what may be a paradigmatic comparison, the enterprises of Gustavus Swift in the nineteenth century and Michael Dell in the twentieth century (Fields 2004). Both entrepreneurs set up high-throughput production and distribution systems. Unlike Swift, who had to integrate vertically to create his system, Dell could plug into an array of already-existing capabilities available from the market. Indeed, Dell succeeded not in spite of having used the market, but precisely *because he did* (Baldwin and Clark 2006). In addition to a thick markets for computer parts, Dell could take advantage of what Stigler (1951) called "general specialties": Swift had had to become a maker of railroad cars in order to ship his goods, whereas Dell could simply hire Federal Express or UPS on contract.[5]

Although it is hard to deny that vertical integration today is lower than it was in the heyday of the Chandlerian corporation, it remains hard for many to let go of the idea that Chandler's visible hand may have lost its grip. For these writers, vertical integration and administrative coordination are potentially orthogonal ideas: even though we have less vertical integration, we still have as much administrative coordination as we had in the mid-twentieth century – or maybe even more![6] (Dosi, Gambardella, Grazzi and Orsenigo 2008; Helper and Sako 2010; Lazonick 2008). Dell is really a Chandlerian corporation after all.

If we are to talk about administrative coordination, we need to begin by thinking hard about what that is. G. B. Richardson (1960, 1972) long ago insisted that

[5] Indeed, Dell has routinely switched among carriers. Matt Kempner, "Dell Drops UPS, Will Use Rivals," *The Atlanta Journal-Constitution*, May 12, 2007.

[6] "[O]ne could legitimately argue that the management of supply chains is a more organisationally complex activity than straightforward vertical integration" (Dosi, Gambardella, Grazzi and Orsenigo 2008, p. 35).

coordination is necessary because of the *complementarity* of productive activities and investments in a world of limited knowledge. Buying livestock, slaughtering, building rail cars, organizing ice houses and warehouses: these are all complementary parts of the chain of production. So are order-taking, motherboards, video cards, microprocessors, and delivery logistics. For production to operate smoothly at high volumes, these complementary activities must be coordinated. But, writes Richardson, "there is no unique single way in which complementary investments come to be co-ordinated. Co-ordination may occur spontaneously without the intervention of measures expressly adopted to that end; under different circumstances, it may be brought about by means of agreements, of one kind or another, between independent firms; in other circumstances, it may require deliberate planning, such as is possible only when the different investments are under unified control" (Richardson 1960, p. 84).

By calling his book *The Visible Hand*, and indeed by much of what he says in the book, Chandler leaves the impression that he is talking about a transition from "spontaneous" coordination to "deliberate planning" under unified control. In fact, however, much coordination has always taken place through "agreements, of one kind or another, between independent firms." This was true in the pre-Chandlerian world, in which generalist merchants coordinated the flow of goods through the American economy (Porter and Livesay 1971). It continued to be true in the era of the large managerial corporation. And it remains true today.

From one perspective, then, the managerial revolution could be understood as a change in the center of gravity of coordination in the direction of more agreements between independent firms and (especially) of more "deliberate planning." The

Spontaneous coordination	Agreements between independent firms.	Deliberate planning under unified control.

Figure 1.

Where to draw the lines?

vanishing hand represents a movement back toward inter-firm agreements and spontaneous coordination. (See figure 1.) As we move from left to right, we are moving from more decentralized to more centralized modes of coordinating. I have long made arguments of this kind myself (Robertson and Langlois 1995).

Note first of all, however, that the modes of coordination are not arrayed in order of increasing sophistication. These are *all* sophisticated modes of coordinating. To notice that Dell Computer and similar operations coordinate a complex supply chain is not to demonstrate that they coordinate in the same way as a classic Chandlerian corporation. More importantly, "internal coordination" and "deliberate planning" are not the same thing. Internal coordination refers to a mode in which coordination, possibly informed by "deliberate planning," is carried out. But, as we have seen, "deliberate planning" can also be carried out through contract and other kinds of arrangement between separate firms.

It is significant that, unlike modern-day critics of the vanishing hand story, Chandler did not see these two concepts as clearly orthogonal. He almost always mentions them in the same breath, and it is generally difficult to distinguish his arguments about administrative coordination from his arguments about vertical

integration. But occasionally Chandler does suggests that, at the margin, managerial coordination is consistent with various levels of integration. For example, in a case to which we will return, Chandler argues that certain industries in Germany and the U. S. developed along parallel lines despite what was in effect different levels of vertical integration. German "cooperative managerial capitalism" achieved its rationalization using a variety of inter-firm arrangements and relationships, whereas, because of antitrust laws, American firms were forced to operate inside large diversified firms (Chandler 1990, pp. 537 and 549). But the end result was the same. In both cases coordination came to be carried out by trained professional managers. It is worth taking note here: Chandler is clear that political institutions matter for *vertical integration*. The "inability of factory owners to enforce and so maintain cartels" is an important explanation for "the growth of the large integrated enterprise" in the U. S. (Chandler 1967, p. 77). So at least one sort of political institution matters for vertical integration. But such institutions don't seem to matter for the rise of administrative coordination in the sense of deliberate planning: unlike Britain, the U. S. and Germany achieved similar levels of managerial coordination in key industries despite their different organizational forms.

In this way, Chandler's imprecision about the difference between administrative coordination and vertical integration gives succor to those who want to argue that the hand of managerial control is as strong and visible today as it was in the heyday of the Chandlerian corporation. I wish to push back vigorously against this argument. In many ways, the it's-all-just-administrative-coordination view runs parallel to the notion in the economics of organization that it is futile define clearly the boundaries of the firm: in the end the firm is nothing other than a *nexus of contracts*, and who can say which contracts

are inside the firm and which outside (in "the market")? As economists like Scott Masten (1988) and Geoffrey Hodgson (2002) have noted, this is a remarkably *non-institutional* way of conceptualizing the institution of the firm. The firm – the modern business corporation – is a *legal* institution. It exists within a (changing) matrix of corporate law, which both enables and restricts business relationships. Notably, for example, the corporation is a *legal person*, and doctrines such as limited liability apply to the corporate legal fiction quite differently from the way they would apply to actual persons. The reality of corporate law means that relationships within the firm are fundamentally different from those that occur across the boundaries of legally distinct firms. Even if contractors can to some extent be "directed,"[7] and even if employees do respond to some extent market forces (as in "internal labor markets"), it remains that employees and contractors are governed by wholly different bodies of law. What lies inside the firm, and what outside, is not ambiguous.

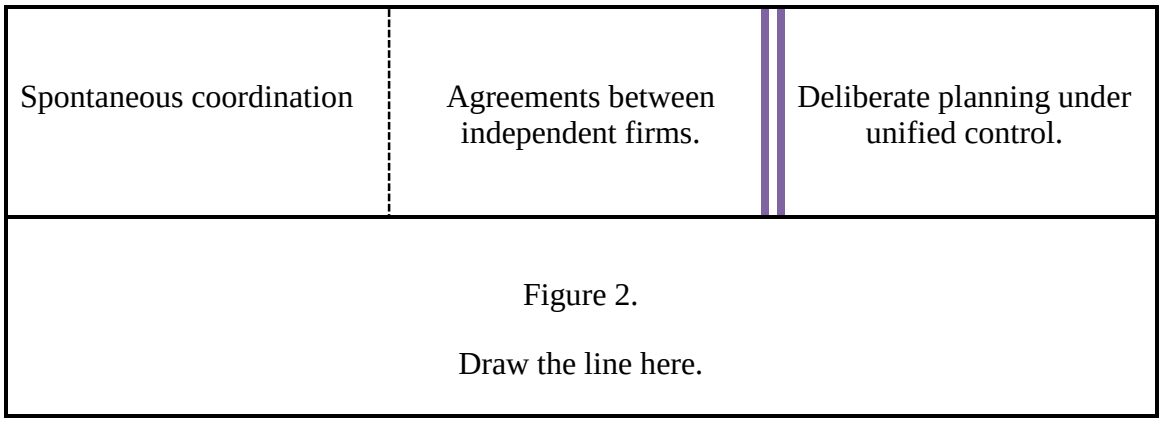

Figure 2.

Draw the line here.

It is certainly true that, functionally, coordination within a firm can be a partial substitute for coordination through agreements among legally separate entities (and vice-

[7] "Telling an employee to type this letter rather than to file that document is like my telling a grocer to sell me this brand of tuna rather than that brand of bread" (Alchian and Demsetz 1972, p. 777).

versa). Indeed, this is a crucial part of my story: we sometimes observe vertical integration not because it is inherently superior in the abstract but because historical circumstances or political institutions have impelled (or perhaps simply permitted) economic actors to coordinate internally economic activities that in other circumstances might have been better coordinated through contracts among legally separate entities. For example, when "markets" become less functional and more expensive, internal administrative coordination would provide a workable second best. Note that I can make this argument precisely because I am unwilling to conflate the firm with administrative coordination.

The hypotheses.

So how, then, did political institutions affect the growth and survival of the large vertically integrated firm, especially during the middle of the twentieth century? It is certainly the case that government policy affected particular industries in defining ways. In the case of consumer electronics, for example, the U. S. government created a giant "national champion" in RCA, which thrived on its portfolio of patents and fed on military research-and-development contracts.[8] But I am concerned here not with particular circumstances but with general trends and forces. What broad government policies and socio-political institutions affected the American corporation in crucial ways during the twentieth century?

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[8] Chandler glosses over the military origins of RCA (Chandler 2001, p. 15) and portrays the company as a paradigm of the private managerial corporation, one that created internal capabilities and led innovation in electronics through its investment in research and development. In reexamining this industry, I have argued to the contrary that, by confining the largely modular technology of the radio within a single organization and imprisoning it within the barriers of its "package licensing" IP policy, RCA arguably *reduced* innovation in consumer electronics (Langlois 2013) by failing to take advantage of what Baldwin and Clark (2006) call the *option value* inherent in such a modular technology.

Recall that for Chandler, antitrust policy sort-of mattered and sort-of didn't matter. In his comparison of the U. S. and Germany in the early century, antitrust policy (and indeed other political institutions) mattered in that, because cartels were illegal in the U. S., managerial capitalism took form within the bounds of large diversified corporations, whereas in cartel-loving Germany, managerial capitalism took form in a less-integrated way through "complex and varied arrangements that the German firms had with each other and with the smaller competitors and producers of related projects within Germany and Europe, including joint ventures, stock participations, cartels, conventions, and agreements involving patents, processes, and marketing – nearly all of which were illegal in the United States" (Chandler 1990, p. 549). On the other hand, antitrust and related policies didn't *really* matter, since the U. S. and Germany both succeeded in establishing managerial capitalism, in what was in effect "parallel development." In Chandler's telling, the outlier was Britain, with its retrograde adherence to "personal" (meaning owner-controlled, not managerial) capitalism.[9]

Chandler's account of international differences in the growth of managerial capitalism resonates with what has come to be called the *varieties of capitalism* literature. Like Chandler, these writers notice that in Germany – a prime example of what they call a *coordinated market economy* – "firms depend more heavily on non-market relationships to coordinate their endeavors with other actors and to construct their core competencies. These non-market modes of coordination generally entail more extensive relational or incomplete contracting, network monitoring based on the exchange of

[9] Chandler's views on British capitalism have been widely attacked, notably by Leslie Hannah (2007a, b).

private information inside networks, and more reliance on collaborative, as opposed to competitive, relationships to build the competencies of the firm" (Hall and Soskice 2001, p. 8). But unlike Chandler, the varieties-of-capitalism school does not see the U. S. and Germany as somehow alike, with Britain as the outlier. Rather, in contrast to Germany and other continental nations, both the U. S. and Britain stand as exemplars of *liberal market economies*, which rely far more on arms'-length relationships and formal contracting.[10]

The varieties-of-capitalism school has in mind capitalism at the turn of the millennium, not capitalism in the early twentieth century. Nonetheless, Hall and Soskice depict Germany in terms very similar to those of Chandler. But they portray the U. S. in a dramatically different way. In the present day of Hall and Soskice, the U. S. is more market oriented than Germany; in Chandler's early century, U. S. firms were more vertically integrated than German ones – that is, much *less* market oriented, in a sense, than German firms in their approach to coordination. If we take both accounts at face value, we are still left with our *explanandum*: why did coordination in the United States rely on high levels of vertical integration in the early and mid-twentieth century but rely far more on market relationships (and, of course, on intermediate modes of coordination) by the end of the century? Here the varieties-of-capitalism approach provides useful, pointing beyond the narrow set of political institutions like antitrust policy that explicitly regulate business and toward a wider range of social and political institutions,

[10] In the end, of course, this is also a kind of "parallel development" idea, in that, despite their marked institutional differences, coordinated market economies and liberal market economies both seem to constitute successful forms of capitalism. No triumphalism here. *A chacun son goût*.

importantly including labor-market institutions, social-welfare policies, and financial regulation, that might shape choices of or organizational form.

My central thesis is that we cannot understand the organization of enterprise in the U. S. during the twentieth century without recognizing that, for much of that period, *the U. S. was a coordinated market economy*. This is not to say that the institutional matrix in the U. S. was identical to those in Europe, Japan, or other coordinated market economies then or today. America was indeed distinctive, along a number of dimensions that would prove crucial to the path American organization took as the twentieth century ended. Nonetheless, the U. S. was not a liberal market economy in the middle of the twentieth century, at least not the kind of liberal market economy the varieties-of-capitalism literature has in mind. Business enterprise in the U. S. lived within a system of coordination, cooperation, restriction, and regulation that helped to reinforce and extend the large vertically integrated enterprises that had arisen in the late nineteenth and early twentieth century. Note that in making this assertion I am not plunging to the opposite end of the explanatory spectrum: I am not now claiming that *only* institutions matter in explaining organizational form. As we will see, factors like extent of the market and the nature of technology and of technological change – and maybe even historical accident – still matter. Indeed, they may matter most. But political institutions also matter; and the middle of the twentieth century was a period in which intrusive political institutions were thick on the ground. We cannot ignore them.

There are two related ways in which political institutions can affect the choice of organizational form. One is that political institutions can change the relative costs of using markets rather than internal hierarchies to allocate resources. The other is that

political institutions can attenuate the competitive pressures that might otherwise impel business enterprise to adopt new organizational forms.

I have already insisted that the value of vertical integration can depend, and in historical fact had depended, on the existing state of markets and market-supporting institutions. Here "markets" means not just "spontaneous" coordination but also an increased number of firms engaged in complementary activities with whom one might forge agreements. To those working in the context of industrial organization in developing countries – as in the literature on business groups and multinational corporations (Hymer 1970; Leff 1978) – this is not a new argument.[11]

> In an advanced country, with a large manufacturing sector, the output of one industry—for example, the steel industry—is likely to have a large and varied number of outlets, so that there may be no acute complementarity between the investment decisions of any few particular units. In poorer countries, on the other hand, the manufacturing sector is likely to be small, so that any increase in output by, say, a steel producer, would have to be absorbed by a small and clearly identifiable number of user firms. In such a situation complementarity would be strong, and profitable investment by one producer might depend on simultaneous expansion by others. The price mechanism, in the ordinary sense, breaks down; … It is difficult to resist the conclusion, therefore, that in underdeveloped countries, the co-ordination of investments—at least in the manufacturing sector—may require more deliberate planning than is necessary in advanced economies. (Richardson 1960, pp. 85-86.)

I have long argued, however, that fundamentally the same argument holds in the American context. For one thing, the U. S. in the nineteenth century *was* a developing economy. Moreover, even in a relatively developed and well-functioning market,

[11] Richardson cites Rosenstein-Rodan (1943), who urged governments in developing countries (and their funders in the West) to undertake a "big push" to industrialize many complementary sectors at once. Such governmental policies have been unqualified failures for a number of reasons, but in many cases the "big push" was in fact carried out successfully by diversified private business groups (Morck and Nakamura 2007). To this we will return.

systemic innovation can creatively destroy existing market linkages and render irrelevant existing market-supporting institutions (Langlois 1992; Langlois and Robertson 1995). It is in this sense that, even in a sophisticated economy, the price mechanism can "break down," and in the short run, internal coordination may be a cheaper way to realign resources.

It follows *a fortiori* that, even in a sophisticated economy, internal modes of coordinating gain advantage on the margin when political institutions impede the ability of the price system to coordinate resources. This is just Coase (1937): an increase in the costs of using the price system will shift the firm-market boundary in the direction of the firm, all other things equal. Political institutions can raise the costs of using the price system by distorting relative prices, thus reducing the information value of prices in rationing resources, or simply by impeding access to the price system.

In an account that has some affinities with the varieties-of-capitalism formulation, North, Wallis, and Weingast (2009) provide insight about when and why states might want to distort relative prices and impede access to the price system. For most of human history since settled agriculture, the dominant form of political organization has been what they call the *natural state*. This form of political organization is "natural" not in any normative sense but in the sense that it is a kind of robust political equilibrium. Rather than thinking about the state as a unified actor, this formulation sees the (natural) state as a coalition of interests, who cooperate in order to earn the rents that come from avoiding a Hobbesian war of all against all. It is the ability to generate and distribute rents that keeps the coalition together. And one way to generate rents is to distort relative prices and control access to the price system. Typically, the natural state permits access

to the price system only through merchants who are themselves part of the governing coalition.

On the one hand, a natural state might degenerate into warlordism, another robust (but far worse) equilibrium. On the other hand, however, a natural state might evolve to become an *open-access order*, of which wealthy liberal democracies like the U. S. would be examples. In an open-access order, the price system is in principle open to all. More significantly, an open-access order does not in principle restrict the kinds of organizational forms available. North, Wallis, and Weingast (2009, p. 16) distinguish between *adherent* organizations and *contractual* ones. The former do not rely on third parties to enforce agreements; cooperation must be incentive compatible for all involved. (The natural state is itself an adherent organization.) By contrast, contractual organizations can avail themselves of third-party enforcement as well as incentive-compatible cooperation. Moreover, open access and the availability of third-party enforcement mean that participants can create perpetually lived organizations – like corporations.

North, Wallis, and Weingast are concerned principally with the problem of economic development. How do – how can – natural states make the transition to open-access orders? They are less concerned with the nuanced differences among actually existing open-access orders. But if we place modern open-access orders like the U. S., Japan, and Western Europe under the magnifying glass, we see a good deal of variation in degree and type of access to the price system, in the manipulation of relative prices, in the availability of organizational forms, and in the mechanisms for enforcing agreements. In short, actually existing open-access orders retain many of the characteristics of natural

states, and it is these natural-state-like characteristics that the varieties-of-capitalism literature is picking up. Liberal market economies are clearly closer to the open-access end of the spectrum than are coordinated market economies, although "spectrum" may be a bit too narrow a way to view things. Nonetheless, it is my contention that the events of the middle of the twentieth century were associated with a movement of Western polities – notably including the U. S. – significantly away from the ideal of an open-access order and in the direction of the natural state. This was not always, or even mostly, a matter of exogenous events impinging on these polities and forcing them to become more like natural states. Rather, the events of the mid-Twentieth Century and the transformation of political institutions were in part endogenous to one another.

The nineteenth century.

There is a long tradition in American political culture, still vibrant today, that looks to Revolutionary and post-Revolutionary America as the touchstone for freedom of contract and the absence of intrusive government regulation. As the economic historian Jonathan Hughes pointed out in his classic *The Governmental Habit* (1977), this picture of early America is far from the reality of the period. At the state level, non-market economic controls were ubiquitous. U. S. states adopted English Common Law, which, while broadly protecting property and contract, was nonetheless replete with business controls of medieval and mercantilist legacy. Moreover, state legislatures quickly assumed powers that had once been vested in a distant Parliament, or indeed in the Crown;[12] and

[12] Incorporation was not the only Crown prerogative that state legislatures assumed. Land in the American colonies was generally held in free and common socage, the least restrictive of traditional tenures, which would come to be called tenure in fee simple. This was in part the result of colonial statutes seeking to protect British creditors by allowing colonial borrowers to pledge unencumbered land as collateral (Priest 2006). The result was that land effectively became a commodity, which was

by the time the ink was dry on the various Revolutionary denunciations of British practices, state legislatures were busy enacting more-or-less the same policies.

One important former Crown prerogative that state legislatures adopted was incorporation, which they exercised with enthusiasm[13] (Maier 1993). States created corporations not just, or even primarily, for business ventures: most were towns and districts, and the majority of the rest, at least initially, were charities, colleges, and the like. Incorporation created a charter, which provided the incorporated entity with a kind of internal constitution of rules. It also made the entity a legal person, shielding its assets from the creditors of the corporation's members (Hansmann and Kraakman 2000). And incorporation created a perpetually lived organization. Early American corporations were thus "creatures of the state" in both senses of the term "state."

It would be a mistake, however, to believe that formal incorporation by a state is necessary for an entity to enjoy corporate personhood, asset partitioning, and perpetual life. As Coasean legal theorists like Larry Ribstein (1991) have argued, all of these properties are potentially available through private ordering under Common Law. This is even true of limited contractual liability, which is after all merely a "feature" that potential creditors or investors can "price in."[14] Indeed, during the period of the Bubble

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to have great import not only for ownership rights generally but especially for the dynamics of westward expansion. Yet socage was nonetheless a feudal tenure, in which the holder was obliged to pay a quitrent to the "donor," ultimately the monarch, who was the real owner and who could repossess on failure to pay. Thus the state government became the "donor," and the quitrent transmogrified into the property tax (Hughes 1977, p. 16).

[13] And this at a time when incorporation had been abolished by the French Revolution and was still forbidden in Britain by the Bubble Act of 1720 (Maier 1993).

[14] Anderson and Tollison (1983) claim that limited liability provisions were in fact enforceable in English law in the eighteenth century, even though they were little used because limited liability conferred few transaction-cost benefits in a world of closely held companies with face-to-face transactions. Whether the law ought to enforce claims of limited *tort* liability as against merely

Act (1720-1825), English courts had cobbled together "a pre-incorporation system that offered many of the effects of separate personality, asset partitioning and limited liability" (Getzler and Macnair 2005, p. 272); and there existed in fact a multitude of "unincorporated corporations" that enjoyed most of the benefits of incorporation without a government-granted charter (Anderson and Tollison 1983). Indeed, despite the American state penchant for incorporation, the majority of early American businesses were not in fact incorporated, and the majority of incorporations did not occur where most economic activity was taking place (Handlin and Handlin 1945).

At least in the case of businesses, early American state legislatures did not dispense charters in order to fill a legal void. They did so to control access to organizational forms and to generate economic rents. Like governments in almost all times and places, American states reserved to themselves the right to charter banks, which they both taxed and invested in, and which provided a major source of public finance (Sylla, Legler and Wallis 1987). State legislatures also chartered many corporations for what were essentially purposes of economic development. The United States was a vast area of land with little transportation infrastructure. Because of near-universal white male suffrage, legislatures felt a strong demand for roads, bridges, and canals, especially from those who anticipated that these improvements would cause the value of their once-isolated land to appreciate. But since such benefits were geographically concentrated, it would have been politically difficult to fund the projects through state-wide taxation. So state governments turned to what John Wallis (2005) has

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contractual liability – that is, limited liability against "involuntary" creditors – is a complex question; but that is not the same question as whether Common Law, unaided by a monarch or a legislature, could or did permit limited tort liability in addition to limited contractual liability.

called "taxless finance": grant monopoly powers to a private corporation by charter, and allow the venture pay for itself out of the resulting rents.[15] It would be a mistake, however, to think that state legislatures of the era were operating under some kind of modern-day theory of natural monopoly. States were in fact happy to grant charters to any business that could claim to be serving the public interest, and there were few that could not find a way to make that claim.[16] The first three business charters granted by Massachusetts were the Massachusetts Bank in 1784, the Charles River Bridge Company in 1785, and the Beverly Cotton Manufactory in 1789 (Maier 1993, p. 54).

As they had in English tradition, state business charters typically came in the first instance with grants of monopoly. Once the bank, or bridge, or coach route was in place, however, the same voters who benefited from these charters began to chafe under the resulting market power, and state legislatures felt pressure to charter competitors (Lamoreaux 2014). In 1828, Massachusetts chartered a competitor to the Charles River Bridge Company, leading to a famous Supreme Court case that came down in favor of the populist desire for competition[17] (Kutler 1971). By the middle of the century, most state legislatures had passed generalized incorporation laws; but, unlike comparable statutes in Britain, which had been crafted by a business elite, the American statutes were larded with restrictions and limitations reflecting the interests of voters (Lamoreaux 2014).

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15 Although taxpayers would retain a contingent liability in the event the venture failed.

16 In this period, state charters did not distinguish among governmental, non-profit, or commercial corporations. The language of "public interest" was identical in all (Maier 1993).

17 *Charles River Bridge v. Warren Bridge*, 36 U.S. 420 (1837).

And here we can begin to see the two constellations of forces that would frame the American Public Choice problem well into the twentieth century. One constellation consisted of the familiar coalition of state government and specific businesses, who had a joint interest in regulating access to the price system in order to create and redistribute rents. The other consisted of the strong populist interests of a far-flung and almost entirely rural population. We could call these forces Hamiltonian and Jeffersonian, except that in fact the Hamiltonian program strictly speaking was for a *national* developmental state, and that program never got off the ground. As I tried hard to emphasize, the policies of non-market control in the early U. S. were typically at the state level. In a world of high transportation costs and relatively low scale, federal-level regulation conferred few political benefits not available more locally, and they implied politically costly income transfers among regions.[18] As a result, the United States was indeed a relatively *laissez-faire* country – at the federal level. At the state level it was quite another matter.

All of this changed in the second half of the nineteenth century, which is where Chandler's story begins. Early railroads had already formed part of state-level transportation schemes, but the Civil War accelerated interstate linkages among railroads. Along with the telegraph and other innovations, railroads dramatically lowered

[18] The federal constitution reserved trade policy to the central government. As a result, tariff policy was hotly contested among regions that stood to gain or lose from a centralized policy. After the War of 1812, falling prices called forth a demand for tariffs. But, perhaps surprisingly, it was the populist interests of the Midwest who most strongly supported them, as the industries in question demanded agricultural products and raw materials, like wool, hemp, and iron, that came from the hinterland. By contrast, tariffs were opposed by many eastern mercantile interests, notably those in Massachusetts, who were heavily involved in the import business. "John Randolph said, in his vigorous fashion, of the tariff bill of 1824: 'The merchants and manufacturers of Massachusetts and New Hampshire repel this bill, while men in hunting shirts, with deerskin leggings and moccasins on their feet, want protection for home manufactures.'" (Taussig 1914, p. 75n1). Southerners also opposed tariffs, as they wanted cheap imports and feared European reprisals against their own exports.

transportation and communications costs, connecting what had been small regional markets into growing and increasingly national ones. Larger extent of the market allowed American producers to tap into, and indeed helped to create, the so-called Second Industrial Revolution of steel, electricity, chemicals, and eventually the internal combustion engine. As Chandler points out, this radically changed economic landscape made it more efficient to produce many kinds of goods centrally at high volumes and then ship those goods to the periphery. The new geographic and technological configuration required a new form of enterprise to coordinate mass production and distribution, leading to the multi-unit managerial corporation, for which the railroads themselves had formed an early template.

As we saw, Chandler's account is all about exogenous economic factors and organizational dynamics. Was there any role for political institutions in the story? In Chandler's account, the railroads were the organizational precursors of the managerial corporation. But railroads – and other infrastructural industries with interstate reach like telephony (Vietor 1994) – were *not* templates for how political institutions responded more generally to the dramatic changes in the economic geography of the United States.

Because railroads had become absolutely critical for the livelihoods of many of their largely rural constituents, state governments felt immediate pressure to exert non-market controls, including price controls. In the *Munn* case of 1877,[19] the Supreme Court granted states the right to regulate any economic activity that was "affected with the public interest," thus placing its imprimatur on practices of long standing. *Munn* upheld

[19] *Munn v. Illinois*, 94 U.S. 113 (1877).

the so-called Granger Laws, which attempted to regulate railroad rates in a way favorable to farmers. Quite apart from harming the interest of the railroads, these state-level price controls wreaked havoc in an interstate network (McCraw 1984, p. 57). In the *Wabash* case in 1886, the Supreme Court invoked the commerce clause of the Constitution and effectively removed rate setting from state hands.[20] The next year the Interstate Commerce Commission (ICC) was born, with the power to regulate rates and to outlaw real or perceived price discrimination.

Gabriel Kolko (1965) famously argued that this was not a victory for the farmers and other shippers; it was not an instance of regulation acting in the "public interest" against the opposition of the railroads. Instead, it was a victory for the railroads, who actively sought regulation to free themselves not only from the tribulations of multiple state regulators but also from the more important problem they faced: competition among one another. Kolko characteristically sees regulation as benefiting industry almost exclusively, an outcome he labels tendentiously as "conservative."

> Business advocacy of *federal* regulation was motivated by more than a desire to stabilize industries that had moved beyond state boundaries. The needs of the economy were such, of course, as to demand federal as opposed to random state economic regulation. But a crucial factor was the bulwark which essentially conservative national regulation provided against state regulations that were either haphazard or, what is more important, far more responsible to more radical, genuinely progressive local communities. National progressivism, then, becomes the defense of business against the democratic ferment that was nascent in the states. (Kolko 1963, p. 6.)

More recent scholars of the political economy of the era are more likely to see regulation as the outcome of a bargain that very much included the interests of various populist

[20] *Wabash, St. Louis & Pacific Railway Company v. Illinois*, 118 U.S. 557 (1886).

groups, who had been empowered by an early and extensive franchise. These bargains were positive sum for the participants, at the expense of players like consumers and other interests not effectively in the bargaining coalition. For example, Gilligan, Marshall, and Weingast (1989) argue that the Interstate Commerce Act benefited the railroads only slightly, and ultimately resulted in a transfer of wealth between two classes of railroad customers, from long-haul shippers to short-haul shippers. (Unlike long-haul shippers, short-haul shippers usually had only one choice of railroad, so the railroads tended to price-discriminate against them.) Needless to say, the short-haul shippers were importantly the "radical" and "genuinely progressive" Midwest farming interests.

In the 1870s, before the coming of the ICC, American railroads suffered under the intense competition of the era. Railroads were high-fixed-cost industries, which meant an ever-present incentive to price below average cost. Making matters worse, the federal land grants and subsidies that had driven inter-state rail also created excess capacity. The railroads tried "pools" and other forms of cartel, but these predictably failed. The emerging industry of petroleum refining had similar problems of fixed costs, excess capacity, and intense competition. So railroad executives cooked up a plan solve their own problems by simultaneously solving those of the refiners (Chernow 1998, p. 135). Using the charter of the South Improvement Company, one of several "improvement companies" the Pennsylvania legislature had created under secretive and presumably corrupt circumstances, the railroads competing for the Pennsylvania oil business brought together a select group of refiners. The most important shareholders were a group headed by John D. Rockefeller, the largest refiner in Cleveland. The South Improvement charter was almost entirely free of restrictions, and included the right to operate across state lines

and to own the stock of other companies. In effect, it was a holding company (Chernow 1998, p. 135). Using a complex system of rebates and "drawbacks," Rockefeller and the other refiners essentially policed a railroad cartel while earning a kickback in proportion to the amount of oil they shipped (Granitz and Klein 1996). This in turn created an incentive for Rockefeller, the dominant player, to acquire more capacity; within months he had bought out almost all the refiners in Cleveland (Chernow 1998, p. 153).

This scheme was in effect an attempt at a private solution to the problem of overcapacity and high fixed costs that the Interstate Commerce Act would later attack through regulation. One constituency left out of this bargaining coalition, however, were the producers of crude oil, who now faced monopsony power. The oilmen banded together and began to embargo shipments in what came to called the "oil war" (Tarbell 1904, ch. 3). As these constituents were almost all in Pennsylvania, the state legislature quickly pulled the charter of the South Improvement Company. This obliged Rockefeller to operate under the restrictive Ohio charter of Standard Oil; and, as he began to acquire refineries in other states, he was forced to employ locally chartered companies. Through 1881, Standard was an "alliance" of 41 separate units, each one operated as some form of corporation, partnership, or trust (Hidy 1952), with substantial cross ownership of shares. "Standard," writes Glenn Porter (1973, p. 65), "was put together with a patchwork of subterfuges." Needless to say, this made administration difficult, especially in view of Rockefeller's strategy of closing inefficient refineries and concentrating production in

large facilities nearer to customers (Montague 1903, p. 309). Moreover, the local nature of its constituent charters made it vulnerable to local political forces.[21]

Standard's general counsel S. C. T. Dodd came up with the famous solution: a stock-transfer trust (Hovencamp 1991, p. 249). The owners of all units would place their stock in the hands of a group of trustees – John D. Rockefeller and his associates – in exchange for a claim to dividends. In effect, Dodd was using the Common Law of trusts to recreate the kind of *carte blanche* corporate charter that South Improvement had enjoyed (Sitkoff 2005). The goal was to place effective control in a central office, which could rationalize holdings and invest in new facilities and technology (Hidy 1952). In the three years after the formation of the trust in 1882, Standard had succeeded in consolidating what had been 53 refineries into 21 highly efficient ones, lowering the average cost of refining from 1.5 cents to 0.5 cents per barrel (Williamson and Daum 1959).

But the states would not give up their power easily. In 1891, Ohio successfully sued Standard Oil on the grounds that its constituent units did not have the power under their individual local charters to enter into a trust arrangement – in legal terminology, the trust was *ultra vires*. Standard was forced to reconstitute itself as an alliance, now of 34 operating units. Yet, because of the growing interconnectedness of the American economy, the ability of states to extract rents through charters was declining, and jurisdictions began adopting the opposite strategy: competing for tax revenue through *removing* restriction from corporate charters, including restrictions on holding the stock

[21] For example, Pennsylvania was threatening to tax the assets of Ohio Standard as a "foreign" corporation (Chandler 1977, p. 323).

of out-of-state corporations (Butler 1985; Grandy 1989). In this competition New Jersey led the way, garnering 61 of the 121 state-chartered corporations with capitalization over $10 million in 1899 (Hovencamp 1991, p. 258). The Standard Oil operating unit in New Jersey took full advantage, becoming the holding company for the entire operation in that year (Hidy 1952). The relatively unrestricted state charter thus became the dominant legal vehicle for the large enterprise, supplanting not only the trust but also federal incorporation, an idea that was never to get off the ground[22] (Hovencamp 1991, p. 247; Sklar 1988, pp. 253-285).

As economic historians of the corporate form have emphasized, corporations want legal institutions to solve two different kinds of rent-seeking problems (Hilt 2014; Lamoreaux 2009; Roe 2013). One of these is the problem of external rent seeking: protecting the corporation from a covetous state and its various interest groups. The other is the problem of internal rent-seeking: protecting internal players from one another, including protecting shareholders from managers and protecting minority shareholders from majority shareholders. State chartermongering effectively solved the first problem. Delaware quickly took over from New Jersey as the preferred jurisdiction for corporate charters after the gubernatorial administration of Woodrow Wilson pushed through severe anti-corporate legislation. As Grandy (1989) has argued, the predictable winner in such a competition would have indeed been a small state like Delaware, since in a small state income from chartering is a relatively large fraction of revenue, thus effectively bonding corporations against expropriation. It is more controversial whether

[22] Naomi Lamoreaux (2004) and her coauthors have argued that, although relatively unrestricted by the standards of early state charters, these late nineteenth-century state charters offered a standardized set of rules useful for the large enterprise but not flexible enough for smaller businesses.

state chartermongering solved the internal rent-seeking problems as well. But in the early years, the move to a Chandlerian managerial structure was just beginning, and corporations could avail themselves of a number of reputational devices – including the good offices of investment bankers like J. P. Morgan (DeLong 1991) – to protect minority shareholders.

In the case of railroads, and later the telephone, rapid economic integration had led to federal-level non-market controls. But in most other industries, the same economic integration had led to a relatively *laissez-faire* institutional regime at the federal level, one that set flexible legal ground rules but was relatively free of direct administrative interference. Left to its own devices, the Common Law of trusts might eventually have evolved an adequate legal structure for the large enterprise, with its need for extensive and complex financing and for managerial control across state borders. But relatively unencumbered state-level incorporation was quicker on the draw: in effect, it was able to reduce the dynamic transaction costs of institutional change, in much the same way – I will argue – as did the organizational innovations of entrepreneurs like Rockefeller.

For the large industrial and distributional concerns, however, the principal instrument of federal power, especially early on, was to be antitrust policy. Although antitrust policy certainly had significant effects on the organization of American industry, it did not impose direct non-market controls (or induce interest-group capture) in the manner of public-utility regulation, thus allowing greater scope for the price system in resource allocation (Hughes 1977, p. 120).

Early antitrust policy in the U. S. was, of course, a significant part of a larger movement to fill the vacuum of federal economic control. It "is something of a sour joke," writes Jonathan Hughes (1977, p. 101), "that the period in American economic history which produced the most rapid real long-term growth rates we have ever experienced, absolute and per capita, also should have been a prolific seedbed of nonmarket control over economic life." Clearly, some interests, like the less-efficient small and medium-sized firms being outcompeted by the large corporations, would have received the force of the gale of creative destruction. Yet many who would arguably have benefited from lower prices and higher wages also came to fear what they did not understand and could not control.

At least until George Stigler (1985) called the idea into question, historians had long sought the origins of the Sherman Antitrust Act in agrarian populism and its vocal opposition to the growth of the large enterprise (Thorelli 1955, p. 143). Stigler pointed out that small agrarian interests actually had little to fear from the large enterprises, and he noted that in the twentieth century antitrust enforcement grew stronger precisely as agrarian influence waned. Other revisionist scholars have reconciled Stigler's objections with the traditional account by suggesting a more subtle pathway through which populism might have influenced passage of the Act (DiLorenzo 1985). The main direct beneficiaries were not indeed the agricultural interests but rather smaller enterprises, like smaller oil refiners, who were among the principal constituents of Ohio Senator John Sherman and the Republican Party (Troesken 2002). One might pause to ask, à la Stigler, why small businesses would be opposed to conventional neoclassical monopolists, who would provide cozy price umbrellas under which less-efficient small firms could huddle.

The obvious answer is that the small players did not see the large enterprises as price-raising monopolies at all but as efficient competitors. In the case of oil – to give just one example – small refiners continued to ship in barrels while Standard had gained tremendous efficiencies using tank cars, for which they were rewarded by lower prices from the railroads. Indeed, Senator Sherman had previously proposed a bill to outlaw differential pricing for tank cars over barrels, a measure that failed only because some independent refineries had also adopted tank cars (Troesken 2002).

In the revisionist telling, the key concern was not in fact "trusts" at all but tariffs, which the Republicans strongly supported. Opponents saw tariffs as "the mother of trusts," that is, as the real cause of higher prices. By attacking the trusts directly, Sherman and his allies hoped to reduce opposition to a proposed tariff bill and at the same time transmit symbolic reassurance to diffuse constituencies – importantly including the agrarian populists – who felt anxious and powerless in the face of major economic change[23] (DiLorenzo 1985; Edelman 1964; Letwin 1965, pp. 86-88).

In a couple of terse sections, the Sherman Act forbade contracts, combinations, or conspiracies "in restraint of trade or commerce" as well as the "monopolization" or attempt to monopolize "trade or commerce."[24] Businesses quickly realized that they could use the statute against labor unions, including the striking Pullman workers led by Eugene V. Debs, as unions were indeed conspiracies in restraint of trade (Primm 1910).

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[23] As *The New York Times* declared on October 1, 1890: "That so-called Anti-Trust law was passed to deceive the people and to clear the way for the enactment of this Pro-Trust law relating to the tariff. It was a humbug and a sham. It was projected in order that the party organs might say to the opponents of tariff extortion and protected combinations, 'Behold! we have attacked the Trusts. The Republican Party is the enemy of all such rings.'" (Cited in DiLorenzo (1985).)

[24] 26 Stat. 209, 15 U.S.C. §§1-7 (1890).

When in 1892 the American Sugar Refining Company, a New Jersey Corporation, acquired the stock of the E. C. Knight Company in Pennsylvania, thus garnering some 98 per cent of U. S. sugar refining capacity, Grover Cleveland directed his attorney general to bring suit under Sherman. In 1895, the Supreme Court handed down the famous verdict that manufacturing – like the refining of sugar – did not constitute interstate "trade or commerce" under the Sherman Act.[25] McCurdy (1979) has argued that this decision did not reflect a "*laissez-faire*" attitude on the part of the court but instead a sincere belief that state-level chartering powers were the appropriate mechanism for control of unified businesses. As we saw, however, states had incentives not to exercise such powers, and federal authority over integrated businesses would soon grow in significance through both judicial and legislative channels. In accordance with the explicit language of Sherman, however, federal courts did immediately seize authority over agreements between legally separate firms acting across state lines; and the Supreme Court quickly issued a string of decisions forbidding price-fixing arrangements, including in the famous *Addyston Pipe* case.[26]

These developments sent a clear signal that coordination through inter-firm agreements would surely face legal scrutiny whereas coordination within the boundaries of a single legal entity likely would not. This created a palpable incentive for firms to integrate. George Bittlingmayer (1985) has argued – a thesis endorsed by Chandler, as we saw – that the Sherman Act thus caused the Great Merger Wave of the turn of the century. Especially during the years 1898-1902, the number of mergers in American

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25 *United States v. E. C. Knight Co.*, 156 U.S. 1 (1895).

26 *United States v. Trans-Missouri Freight Ass'n*, 166 U.S. 290 (1897); *United States v. Joint Traffic Ass'n*, 171 U.S. 505 (1898); and *United States v. Addyston Pipe & Steel Co.*, 175 U.S. 211 (1899).

manufacturing industry spiked. Most mergers took the form of full consolidation of assets, though many, including the one creating Standard Oil, employed the holding-company form (Bonbright and Means 1932, p. 69). Eighteen ninety-nine was the banner year, with four times the number of consolidations of any other year of the wave (Bittlingmayer 1985; Lamoreaux 1985). Among those firms merging were the very makers of cast-iron pipe whose cartel arrangement had been rendered illegal by the Supreme Court in the *Addyston* case (Bittlingmayer 1982). Here we begin to glimpse the great irony of American antitrust policy at the turn of the twentieth century: legislation pushed in part by small independent businesses to ward off the threat of the giant corporation actually harmed the small firms, which relied on coordination through contract, and reduced the relative cost of coordination within boundaries of large enterprises.

All authors have emphasized the problem of high fixed costs in late nineteenth-century American industry. But any comparative-institutional analysis of holding companies versus inter-firm agreements would have to account fully for the speed and drama of the transformation to mass production. Of course, rapidly changing economic conditions would make cartels harder to police, and the depression of 1893 would have made coordination all the more imperative (Lamoreaux 1985, p. 188). But even this way of putting the matter fails to appreciate the larger Schumpeterian forces at work, especially in the recovery from the depression of 1893. Between 1894 and 1903, real U. S. GDP grew at an average annual rate of 5.23 per cent; despite mass immigration,

real GDP per capita grew at 3.41 per cent over that period.[27] After 1891, multi-factor productivity was more than double what it had been in the 1871-1891 period; taking into account the composition of the U. S. labor force, it was four times higher (Gordon 1999, p. 124). And perhaps most notably, U. S. capital stock increased at a phenomenal rate: "In 1870 the capital stock of the United States was about 25 percent greater than that United Kingdom's; in 1910 the U.S. capital stock was almost four times larger. Over that period, the increase in the U. S. capital stock was six times greater than the growth of the British stock" (Allen 2014, p. 332).

As Chandler emphasized, growth of this magnitude required, and was in turn driven by, dramatic changes in organization and technology. In principle, the required creative destruction could have taken place "through the market," meaning that inefficient firms would go out of business while more efficient ones would grow. As entrepreneurs like Rockefeller and Carnegie well understood, however, this mode of transformation would have been slow and costly relative to the alternatives of inter-firm coordination and (especially) of consolidation and administrative coordination. In my interpretation of Chandler (Langlois 2003b), I have always stressed the role of internal organization in overcoming the dynamic transaction costs of coordinating *vertical* flows. But in the Schumpeterian gale of the late nineteenth century, consolidation into legally unified entities could also overcome the *horizontal* dynamic transaction costs of economic change more cheaply than "markets" or cartel agreements.

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[27] Samuel H. Williamson, "Annualized Growth Rate and Graphs of Various Historical Economic Series," MeasuringWorth, 2014. URL: www.measuringworth.com/growth. Accessed 16 October 2014.

One important speed-bump to change via "markets" emerges right out of the Principles of Economics textbook: many small producers continued to produce at a loss so long as they could cover their variable costs[28] (Chernow 1998, pp. 149-150). More significantly, in an era before well-developed capital markets, smaller entrepreneurs had no exit strategy apart from handing their illiquid and highly undiversified holdings on to their descendants (Porter 1973, p. 75). In this respect, "trusts" like Standard Oil served as internal capital markets. A few successful industrialists, notably Rockefeller and Swift, had prospered through close ties with regional banks; others, like Carnegie, had raised capital through face-to-face relationships with individual backers (Davis 1966, pp. 264-265). As Lance Davis has emphasized, banks in general were a far less ready source of capital for industrial enterprise in the U. S. than in the U. K. This was in part because American industrial transformation was more radical; but it was also in large part because U. S. banks were fragmented and hampered by state-level regulation that catered to agricultural interests and existing small bankers (Calomiris and Haber 2014).

In this telling, the Great Merger Wave was the result of the sudden emergence of a market for industrial securities, the result of a perfect storm of forces during the strong recovery from the depression of 1893 (Telser 1984, p. 271). By this time a ready pool of liquid savings had become available in the American economy, mostly from domestic sources, as the large inflows of foreign capital went mostly into railroads (Porter 1973, p. 76). As we saw, the New Jersey Holding Company Act of 1899 created a powerful legal vehicle for issuing stock. And by 1898 J. P. Morgan had begun turning his attentions to industrial consolidations, partly because of diminishing returns to the railroad deals on

[28] Get similar Carnegie quote.

which he had made his name and partly because of the relative strength that industrials had displayed during the downturn (Davis 1966, p. 269; Porter 1973, p. 77). The development of relatively liquid stock market created an additional exit mechanism for less-efficient small firms, who could now be bribed to exchange their holdings for a piece of the joint rents of consolidation – a piece worth more than their original illiquid and undiversified holdings.

Were these consolidations undertaken to promote monopoly, as most commentator have assumed? Or did they reflect the transformation of inefficient personal capitalism into rationalized managerial capitalism, as Chandler maintained? The answer, of course, is both. The consolidations were no doubt all undertaken to reduce competition and increase rents – against a backdrop of high fixed costs, intense competition, rapidly increasing output, and falling product prices. But apart from cases involving a property-rights barrier to entry – U. S. Steel's control of Mesabi ore might be an example – most combination quickly succumbed to competition from new entrants. By the early 1900s, Standard Oil itself was already under attack from new sources oil in Texas and the West (Chernow 1998, p. 431). Those combinations that survived were the ones that transformed themselves into Chandlerian firms (Lamoreaux 1985, p. 183; Porter 1973, p. 81).

The Progressive Era and World War I.

It was not long before holding companies too came under the purview of Sherman. In 1902, Theodore Roosevelt initiated a suit against the Northern Securities Company,[29] a

[29] *Northern Securities Co. v. United States*, 193 U.S. 197 (1904)

railroad holding company, and the Supreme Court upheld the breakup of the company into its constituent railroads, thus effectively overturning *E. C. Knight*. In less than a decade, the holding company form had morphed from a legal safe haven to a source of danger. Once again, firms responded to the changed incentives. Lawyers began advising corporate executives to rid themselves of any vestiges of the holding company form (and certainly any vestiges of cartel agreements) and to integrate instead into a centrally administered unit (Chandler and Salsbury 1971, p. 113). As early as 1903, DuPont attorneys warned that the structure of the corporation, which owned the stock of legally separate companies and had its hands in the gunpowder cartel, "had become 'absolutely illegal,' and that legal safety lay in abandoning the old ways and concentrating on building one big company" (Chandler and Salsbury 1971, p. 112). American antitrust policy thus encouraged administrative coordination within unified enterprises and discouraged coordination across the boundaries of firms. "Many industrialists might have been content to continue on with their cartels and associations, which was certainly the case in the European nations, where no legislation similar to the Sherman Act existed" (Chandler and Salsbury 1971, p. 113).

On the same day in 1911, the Supreme Court sanctioned the breakup of Standard Oil and American Tobacco, and the breakup of DuPont's gunpowder business followed soon after.[30] Despite their movements toward full integration, these companies were vulnerable under Sherman because they retained some elements of the holding company and the cartel (Chandler and Salsbury 1971, p. 118). It is significant, however, that the

[30] *Standard Oil Co. of New Jersey v. United States,* 221 U.S. 1 (1911*); United States v. American Tobacco Company,* 221 U.S. 106 (1911); *United States v. DuPont,* 188 F. 127, 140 (C.C.D. Del. 1911).

breakups could not simply disassemble a holding company (as had been the case with Northern Securities) but required the cloning and spinoff of integrated companies like Atlas and Hercules Powder.

The framers of the Sherman Act may not have cared whether antitrust policy actually had any teeth, but by the Roosevelt and Taft Administrations, it had acquired many pointy ones. It was during the Wilson administration, however, that Progressives were finally able to check off a significant number of agenda items. These included the Federal Reserve System, the regulation of the telephone system, and an income tax on the rich. In the area of antitrust, the year 1914 saw the passage of the Federal Trade Commission Act and the Clayton Act. In keeping with the Progressive philosophy of regulation by experts, the FTC Act set up an independent commission, which would work in parallel with the Department of Justice, to administer the provisions of the Clayton Act and to police "unfair" methods of competition, a term of art that included many types of vertical contractual arrangements (Hovencamp 1991, p. 336). The Clayton Act, "a particularly formless and unorganized piece of legislation" in the contemporary opinion of Allyn Young (1915, p. 305), enumerated specific contractual and organizational practices that were to be illegal "where the effect may be to substantially lessen competition or tend to create a monopoly" (Neale 1960, p. 187). These arrangements included tying, price discrimination, and exclusive dealing. Section 7 of the Act outlawed holding companies, and Section 8 forbade interlocking directorates.

Far more explicitly than the Sherman Act, then, the Clayton Act militated in favor of the integrated multi-unit Chandlerian corporation. The anti-holding-company provisions made explicitly vulnerable any form of organization in which operating units

are separate firms issuing their own stock, and the provisions against a wide variety of contractual arrangements made it more dangerous for independent firms to coordinate economic activity across the boundaries of the firm.

In a classic holding company, an apex firm holds all the stock of the subsidiary firm. But it is also possible for the apex firm to retain a controlling interest in the operating unit while selling the remaining shares to minority stockholders. Indeed, it is nowadays common outside the U. S. (and the U. K.) for subsidiary firms in turn to hold a partial but controlling interest in yet other firms, forming a pyramidal business group (Morck 2010). The Clayton Act would have formed a clear impediment to coordinating production through business groups. As we saw, Sherman had already sent the message that an integrated firm would be less vulnerable than a holding company. But the Clayton Act amplified the transmission.[31] The language of Section 7 made it illegal for one company to acquire the stock of another "where the effect of such acquisition may be to substantially lessen competition *between the corporation whose stock is so acquired and the corporation making the acquisition*" (emphasis added). "Thereby, the use of the holding company as a device for combining competing concerns was virtually outlawed (where interstate commerce was involved), even when monopoly was not the aim" (Bonbright and Means 1932, pp. 75-76).

Economists, who have naturally but mistakenly tended to see the antitrust laws as about competition and monopoly in the neoclassical sense, have long been puzzled by the "loophole" in Section 7 of the law: whereas it may be illegal to merge with another firm

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through a stock purchase, it would not be illegal to acquire the firm's tangible assets. In fact, this "loophole" was a feature not a bug: Congress cared not about mergers but only about outlawing the form of the holding company, which its constituents identified with "trusts" (Martin 1959). (The so-called asset loophole was closed by the Celler-Kefauver Amendments of 1950.) As in the case of the Sherman Act, the Clayton Act was in significant measure an instance of the symbolic uses of politics. Allyn Young (1915, p. 326) noticed Congress's keen awareness of "the undoubted fact that a majority of the voters at home would interpret a Congressman's vote against an 'anti-trust' statute as a vote for monopoly."

Even before the Clayton Act, antitrust had taken aim at vertical contracting. The central thrust of the Sherman Act was to render illegal contracts "in restraint of trade." Courts thus had to decide – without much help from contemporary economists let alone the framers of the Act – which of the many kinds of contracts that firms employed to coordinate economic activity would be illegal "restraints" and which, if any, would not. Were *all* contracts "restraints of trade"? If so, were all contracts "bad" restraints? Martin Sklar (1988, pp. 137-161) is not alone in breaking the early enforcement of Sherman into three periods. Until 1897, the Supreme Court held to a "common law" interpretation in which only "unreasonable" restrictions were illegal. But with the *Trans-Missouri Freight* case, the court essentially rendered illegal *per se* all restrictions – and thus potentially all contracts, since a contract is in essence a restriction.[32] Only with the breakup cases of 1911 did the Court re-introduce a common-law-like rule of reason.

[32] *United States v. Trans-Missouri Freight Association*, 166 U.S. 290 (1897).

Yet it was the same year of 1911 that saw the Court outlaw *per se* a prototypical vertical contractual arrangement: resale price maintenance.[33] Under this kind of contract, sellers are bound (explicitly or by threat of refusal to deal) to maintain a price set by the manufacturer. To the courts and indeed most observers, this is manifestly a "restraint of trade," since sellers are restrained from offering discounts, that is, restrained from competing on price. The Court may perhaps be forgiven for getting this wrong, as it was not until the second half of the century that even economists began to understand the logic of RPM and other vertical arrangements, and prominent contemporary economists, including the likes of Frank Taussig, mostly talked nonsense on the subject[34] (Breit 1991). Economists nowadays understand that contractual arrangements that seem puzzling from a narrow neoclassical view very often arise in fact to solve problems of limited knowledge and transaction costs (Williamson 1979).

In the case of RPM, there have emerged a raft of plausible efficiency explanations. Notice first that RPM cannot have the purpose of enforcing a cartel among resellers, since absent informational and transaction cost issues, manufacturers have no incentive to allow this. Notice also that RPM eliminates price competition among the sellers of a particular manufacturer's product, but it does not eliminate competition among manufacturers. One could argue tenuously that RPM might make it easier for manufacturers to monitor one another's prices and thus collude tacitly. But there are far better reasons for RPM. Manufacturers may want to eliminate reseller competition along the price margin in order to force competition to take place along various non-price

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33 *Dr. Miles Medical Co. v. John D. Park & Sons Co.*, 220 U.S. 373 (1911).

34 On the other hand, Oliver Wendell Holmes dissented in the *Dr. Miles* case on the sensible grounds that perhaps business people know more about business practices than courts do.

margins, especially sales effort and pre- or post-sales service. If some resellers are allowed to discount, customers can free ride on the service of the non-discounters and then buy from the discounters, which will create an incentive for no one to provide the services and sales effort (Telser 1960). Manufacturers may also want to control the resale price in order to send a quality signal (Marvel and McCafferty 1984). Apple nowadays is a good example of this.

The important point to notice here, however, is that, efficient or not, RPM is a contractual arrangement that can be effectively replicated by vertical integration: if the manufacturer owns all its own resale outlets, it can set whatever resale price it wants. Of course, there may in fact be costs to vertical integration. The manufacturer will need to develop new capabilities in distribution, and would forego the benefits local knowledge and of the high-powered incentives of local ownership. Franchising would be a way around these costs; but franchising implies exclusive dealing, a practice also enumerated in Clayton.

Once again, antitrust policy created an incentive for coordination through integration rather than through contract. And, once again, a law put in place with the backing of small business ended up harming small business. No less a figure than Louis Brandeis understood this clearly. As Brandeis put it in a letter to commerce secretary William C. Redfield in 1913, by restricting vertical contracting, antitrust policy was "playing into the hands" of the large department stores and chain stores that were beginning to arise in the early twentieth century and was giving advantage to large concerns like Standard Oil that "can retail an article as well as manufacture" it (McCraw 1981, p. 47). Brandeis believed that the central goal of government policy toward

business was to protect small competitors – indeed, to maximize the number of competitors – not to benefit consumers let alone to promote economic efficiency.[35] It is largely because of the opposition of small business that U. S. policy toward RPM, both judicial and legislative, has see-sawed back and forth since *Dr. Miles*.

Were there no forces in this period militating towards vertical disintegration? In keeping with the prevailing ethos at the end of the nineteenth century and the beginning of the twentieth, both business and government looked to industrial standardization as the road to "efficiency" and "rationalization." By its very nature, standard-setting faces a collective action problem. Vertical integration, which can impose standards by fiat, is one solution to this problem. But the creation of *public* standards – at the interfaces or connections between stages of production – can spur vertical disintegration (or reduce the pull of integration) by lowering the transaction costs of coordinating production through the market (Langlois and Robertson 1992).

Because of the collective-choice problem, initiatives for public standards almost always emerged under the aegis of industry trade associations. For example, under the leadership of Howard E. Coffin, a vice-president of the Hudson Motor Car Company, the Society of Automotive Engineers reduced the types of steel tubing in use from some 1,600 to 210 and the types of lock washers from 800 to 16 (Epstein 1928, pp. 41-43). It was the smaller assemblers who took interest in these standards, whereas the larger firms like Dodge, Ford, GM, Studebaker, and Willys-Overland tended to rely on their own in-house standards (Thompson 1954, pp. 10-11). The story was similar in industries like

[35] Thus in many ways Brandeis "was less the 'People's Lawyer' than the 'petite bourgeoisie's lawyer'" (McCraw 1981, p. 47).

lumber and cotton textiles, where economies of scale were low and competitors many (Galambos 1966). Note that whereas standardization of interfaces might promote vertical disintegration, it would have the opposite effect on horizontal size. Without standardization, buyers would have to negotiate specifications with individual suppliers; with standardization, a few larger suppliers could mass produce standardized parts on spec.[36] Indeed, the small auto assemblers of the early century became keen on standardization after many of their small suppliers failed in the panic of 1910 (Epstein 1928).

Of course, civilian antitrust and other policies were soon overshadowed by the first great calamity of the twentieth century, World War I. Although American mobilization for and participation in the war spanned little more than a couple of years, federal policy during the first World War – including policy toward industry – set the template for the federal response to both the Great Depression and World War II (Eisner 2000; Leuchtenburg 1964, p. 84).

When war broke out in Europe in 1914, the U. S. was experiencing a mild recession. American industry quickly began supplying the belligerents with war-related goods, including food and clothing. An immediate problem was shipping: with German and Austrian ships impounded or sequestered and many British ships converted to military uses, the supply of shipping decreased just as the U. S. demand for shipping,

[36] A 1919 article in the *Annals of the American Academy of Political and Social Science*, by one Homer Hoyt, a young economist with the soon-to-be-dismantled War Trade Board, is representative of contemporary views. On the one hand, Hoyt applauded standardization and reduced variety, including the standardization of consumer goods. This would manifestly increase "efficiency," as consumer tastes for variety were mere "eccentricities" not worthy of serious consideration. On the other hand, such standardization would lead to massive industrial concentration, against which antitrust policy would have vigorously to defend (Hoyt 1919). Hoyt would go on to be a noted real-estate economist, developer, and consultant.

including for a Latin American market abandoned by the belligerents, increased dramatically. President Wilson called for a government corporation to build and lease ships, which Congress authorized in 1916 (Rockoff 2012, p. 125). In the same year, Congress produced legislation granting the administration sweeping powers in times of war "or when war is imminent" to direct production, set prices, and commandeer private property (Higgs 1987, pp. 128-129).

But the template for official war mobilization was actually set by the private sector in the years before the official U. S. declaration of war. The belligerents desperately needed supplies, along with loans to finance those supplies. Britain and France turned to the House of Morgan, which became not only financier but also purchasing agent and industrial coordinator for the Allies. J. P. Morgan and Company was an investment bank. But it was also the nexus of what could fairly be called a business group. Morgan was selective in the businesses it financed; it normally insisted on appointing one of its own representatives to a company's board; and it sometimes held shares.[37] More significantly, Morgan was at the center of a network of contacts within virtually the whole of American business. And with important and long-standing offices in London and Paris, Morgan also had a stake in an Allied victory.

It was David Lloyd George, then Chancellor of the Exchequer, who suggested concentrating purchases through Morgan (Forbes 1974, p. 46). To head what would become the "Export Department," Morgan turned to Edward Stettinius, a serial

[37] Bradford DeLong has argued that this hands-on financing model was valuable as a monitoring device, by what would nowadays be called activist investors, in an era without high liquidity and without formal institutions of investor protection. Firms affiliated with Morgan had higher returns than unaffiliated firms (DeLong 1991) and suffered fewer problems of liquidity (Ramirez 1995).

entrepreneur and managerial fixer who was then running the Diamond Match Corporation. Stettinius built up a staff specialized by industry and set about becoming the largest buyer in the world. The task included financing new plants where necessary, including, for example, plants capable of manufacturing 15,000-20,000 British Enfield and Russian rifles a day (Forbes 1974, p. 62). During 1916, American exports to Great Britain more than doubled, and during the period 1915-1917, the U. S. accounted for 24 per cent of Allied munitions (Glaser 2000, p. 390). Note that Stettinius was in every respect a Chandlerian manager, though one who engaged in administrative coordination across the boundaries of firms using price-mediated agreements.

When the U. S. formally declared war in spring 1917, Stettinius was out of business. Rather than continuing simply to arm the Allies or even to produce arms for American troops to Allied specifications, the federal government set up a wholly new system of mobilization. (This was so for a variety of political reasons, not the least of which was the need for the Democratic Wilson administration to distance itself from Morgan.) The totality of the mobilization effort amounted to what Rexford Guy Tugwell (1927) famously and approvingly called "America's War-Time Socialism."

Congress immediately instituted a military draft, and authorized an absolutely astounding apparatus of propaganda, control of the press, and prosecution for seditious speech (Dos Passos 1962, pp. 217-219 and 300-302; Nagler 2000). Although the government ultimately created or nationalized some industries, including shipbuilding, railroads, telephone, telegraph, and radio, mobilization was for the most part an elaborate relationship of bargaining between government and private industry. To this end Congress empowered a number of agencies. The Lever Food and Fuel Act in 1917

created two agencies with the power to license producers and control prices: Herbert Hoover, who had recently led successful relief efforts in Belgium, was put in charge of food; Harry Garfield, president of Williams College and son of the former U. S. president, was placed in charge of fuel. Standards maven Howard Coffin took charge of the Aircraft Production Board. The most important agency, however, was the War Industries Board (Clarkson 1923; Cuff 1973). Under the direction of Bernard Baruch, the WIB was the central planning agency of the war effort, staffed largely by the so-called dollar-a-year men, who came to Washington with specialized knowledge from private industry. One of the principal subunits of the WIB was the Price Fixing Committee, headed by Robert S. Brookings, who would soon endow the eponymous think tank.[38] Frank Taussig was a committee member.

In many respects, the War Industries Board was the Morgan Export Department writ large. It was a centralized purchasing agent that negotiated contracts with private suppliers. But the WIB differed from the Morgan effort not only in the scale and scope of its mission but also in that it could call upon the police powers of government.

[38] Although the PFC was part of the WIB, Brookings reported directly to the President, not indirectly through Baruch.

The Great Depression and the New Deal.

World War II.

The Corporate Era.

The Undoing.

The Corporation and the Twentieth Century.

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