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Department of Economics Working Paper Series

Business History as Institutional History

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Working Paper 2025-07
July 2025

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This working paper is indexed in RePEc, <http://repec.org>

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Paper for the special issue of *Business History*
on “Chandler Redux? Looking Back to Move Forward”

THIRD DRAFT

June 2025

ABSTRACT

This paper will revisit the intersection of Chandler with Williamson (and the NIE more generally) and attempt to draw lessons from it. I will argue that despite their similar influences, from both the Carnegie School and more generally from the varied currents of post-war managerialism, Chandler and Williamson modeled the corporation quite differently. On the one hand, their disagreement had what I view as a salutary effect the economics of organization by lending the imprimatur of Chandler to the *capabilities* approach. On the other hand, Chandler’s rejection of the NIE also arguably threw out the Coasean baby with the Williamsonian – or, more precisely, the asset-specificity – bathwater. I attempt to outline a path for post-Chandlerian business history that retains the lessons of Weber and the Carnegie School while adding the lessons of Coase.

Journal of Economic Literature Classifications: B15, B25, B31, L21, L22, L25

Keywords: Alfred Chandler, Oliver Williamson, Ronald Coase, transaction costs, capabilities, diversification, asset specificity

In 1971, Alfred Chandler published a paper called “Business History as Institutional History,” a title I here appropriate. Chandler argued that business historians ought to steer a course between the Scylla of “detailed, disparate, diffuse or even ... dull” antiquarianism on the one hand and the Charybdis of formal mathematical modeling on the other. To do this, he believed, business historians should build on the institutional history of Max Weber, Joseph Schumpeter, and Talcott Parsons, while at the same time incorporating the qualitative modeling style of contemporary figures like Chester Barnard and the so-called Carnegie School of Herbert Simon, James March, and others.

In the years after 1971, many began to argue that business historians should look for their middle ground of theory in the so-called New Institutional Economics (NIE), built on the work of eventual Nobelists Ronald Coase, Douglass North, and Oliver Williamson.¹ By the late 1970s, Chandler had come fully into contact with this NIE literature, especially in its Williamsonian form. As, uniquely among major proponents of the NIE, Williamson had emerged from the Carnegie School, the fit seemed a natural one. Yet although he would flirt with the NIE, Chandler was never comfortable with it, and in the end he would reject it in favor of dissident strands of the economics of organization more congenial to his own original framing of the problem of institutional history.

This paper will revisit the intersection of Chandler with Williamson (and the NIE more generally) and attempt to draw lessons from it. I will argue that despite their similar influences, from both the Carnegie School and more generally from the varied currents of post-war managerialism, Chandler and Williamson modeled the corporation quite differently. On the one hand, their disagreement had what I view as a salutary effect the economics of organization by

¹ At roughly the same time, there developed renewed interest in institutions in a number of disciplines, notably including management and organizational sociology. See Powell and DiMaggio (1991) and Scott (2013) for discussions of how the new institutionalism in management and sociology differs from its counterparts in related disciplines, including economics.

lending the imprimatur of Chandler to the *capabilities* approach. On the other hand, Chandler's rejection of the NIE also arguably threw out the Coasean baby with the Williamsonian – or, more precisely, the asset-specificity – bathwater. I attempt to outline a path for post-Chandlerian business history that retains the lessons of Weber and the Carnegie School while adding the lessons of Coase.

Weber, the Carnegie School, and post-war managerialism.

Alfred Chandler was always explicit about his intellectual influences. He credited his interest in studying institutional history, as he would understand that term, to his studies at Harvard with Talcott Parsons (Chandler 2009, pp. 237-238). Through Parsons he came into contact not only with Parsons's own structural-functionalism but also, and importantly, with the ideas of Max Weber. Through Parsons, Chandler also encountered other German-language thinkers like Werner Sombart, as well as contemporary writers on management like Chester Barnard (1942) and Peter Drucker (1954). These currents were reinforced by proximity to the intellectually imposing figure of Joseph Schumpeter, who had helped found the Research Center in Entrepreneurial History at Harvard after the war. Although Schumpeter died in 1950, Chandler would find a replacement in the émigré scholar Fritz Redlich, who shared many of the same German-language influences as Schumpeter, notably Weber and Sombart.

In order to understand the importance of Weber and Sombart to Chandler's institutional history, we need to step back in time for a moment. In the 1870s, there emerged, in three different parts of Europe, what historians of economic thought call the marginalist revolution. Coming at the problem from different directions, these economists added a theory of demand to the classical focus on costs of production, thus creating so-called neoclassical economics. One of them was Carl Menger in Vienna. Although his version was richer and less formal than those of fellow

revolutionaries William Stanley Jevons and Léon Walras (Jaffé 1976), Menger quickly came into conflict with Gustav Schmoller and the German Historical School, who – to put it in perhaps the most generous way – saw social life as encompassing a diversity and complexity refractory to the kind of abstract and relatively context-free analysis Menger had developed (Lane and Riemersma 1953). Schmoller and his school would influence many of the key figures in contemporary American economics (Rodgers 1998), who would constitute the original or “Old” Institutional Economics (Rutherford 2011).

This is where Weber, and to some extent the more problematic figure of Sombart, come in. As a newer generation of the historical school, they, especially Weber, wanted to find a way to create a theory of institutions that, although abstract, would be able to capture the essential complexity of social institutions. Thus the notion of *ideal types*, which became a touchstone for Chandler. By taking advantage of the human cognitive faculty of understanding (*Verstehen*), one could effectively abstract away from particular cases and in effect model a complex institutional structure. In this way, Weber provided what we can call *meso* theory: a conceptual framework able to abstract from concrete historical facts yet at the same time able to capture much of the richness of historical experience. For Chandler, an ideal type was “a verbal or nonmathematical model” (Chandler 1971, p. 20).

In an early paper with Fritz Redlich – in a section almost certainly written by Redlich – Chandler makes the distinction between the function of top management (the entrepreneur) and the function of the middle management. Middle management carries out the day-to-day operations of the enterprise, allowing top management to specialize in “goal determination and planning.” Chandler and Redlich emphasize that these categories “are ideal types with which the generic

figures of reality must be compared, if analysis of reality is desired” (Chandler and Redlich 1961, p. 21).

Thus, one part of institutional history is the study of the business enterprise as an institution. But it is not the only part. More generally, Chandler thinks, history should study “regularized patterns of actions between organizations, and between organizations and individuals” (Chandler 1971, p. 20). This could easily describe the developing program of the New Institutional Economics. But Chandler’s understanding of institutions has the feel of “systems theory” to it. He quotes approvingly a source for whom history shows people “managing and being managed through rational systems of control and communication” (Higham, Kriger and Gilbert 1965, pp. 230-231). This should not be surprising, considering that Chandler was writing during the post-war heyday of systems theory. He invokes the Carnegie School of Herbert Simon, James March, and others (Cyert and March 1963; March and Simon 1958), which was very much attempting to understand organizations as rational systems of control and communication. Like the ideal-typical functions to which Weber and Parsons had pointed, the Carnegie School was offering a form of meso-level theorizing about institutions.

This stands in contrast to Chandler’s perspective on the developing field of cliometrics in 1971. Although cliometricians like Douglass North no doubt provided a valuable service, he believed, they were not institutionalists. Their interest “is with that which is quantifiable. The emphasis on and manipulation of numbers, so central to the new economic history, provides natural limits to its descriptive and analytical use” (Chandler 1971, p. 17). What was true of cliometrics was even more evident in the larger field of economics. Once the province of “Old” Institutionalists, the profession had moved decisively in the direction of institution-free mathematical formalism, as, in keeping with the spirit of the times, Paul Samuelson (1947) and

others developed the neoclassical legacy not of Menger but of Jevons and (especially) Walras (Mirowski 1984).

Williamson and the New Institutional Economics.

Yet, by the 1970s, there were stirrings. In 1972, Ronald Coase could still famously lament that his path-breaking article from 1937, “The Nature of the Firm,” was “much cited and little used” (Coase 1972, p. 63). But his more recent paper “The Problem of Social Cost” (Coase 1960) had begun to energize what would become a more-or-less coherent school of thought. In both these papers, Coase had shown the importance of transaction costs to explaining institutions – and the importance of institutions to explaining economic outcomes. Soon a following, noticeably at the University of Chicago and its offshoots, began to offer economic explanations of a wide variety of institutional phenomena, all foregrounding an awareness of imperfect knowledge and transaction costs. At the same time, Douglass North, whom Chandler had understood as an exemplar of pure cliometrics, was actually in the process of developing his own highly influential account of the role of institutions (North 1971). By 1975, Oliver Williamson could proclaim, on the first page of *Markets and Hierarchies*, “an evolving consensus that received microtheory, as useful and powerful as it is for many purposes, operates at too high a level of abstraction to permit many important microeconomic phenomena to be addressed in an uncontrived way” (Williamson 1975, p. 1). Williamson called this consensus “the new institutional economics.”

Although Williamson was clearly influenced by Coase, whom he quotes abundantly on the next few pages of the book, Williamson was also influenced by the Carnegie School. He was a doctoral student at what was then the Carnegie Institute of Technology (later, after a merger, Carnegie Mellon University) during the first years of the 1960s, a time of great interdisciplinary intellectual ferment (Mahoney and Nickerson 2022, pp. 196-197). His dissertation project

(Williamson 1964) would become a centerpiece of the so-called managerial theory of the firm: in a world of managerial discretion – which seemed so clearly to be the world of the post-war corporation in the U. S. – economists should not represent the firm as merely maximizing profit but should explicitly model the objective functions of the managers who ran the companies.

Williamson also quickly became a fan of Alfred Chandler. In 1962, Chandler published his first great work, *Strategy and Structure*. Chandler had long been interested in decentralization in industry (Chandler 1956), but an opportunity to work with Alfred P. Sloan, Jr. on the latter's eventual (second) autobiography (Sloan 1964) shed new light on the problem. Working with Sloan, Chandler had access to the GM archives (McKenna 2006). In keeping with the structural-functional approach, he had long thought about functional units within the enterprise; but in examining General Motors (along with Du Pont and other businesses), Chandler refined his thinking into the theory of the M-form structure. As output expanded – and, crucially, as output diversified in physical space and product space – large corporations decentralized their structure not according to organizational functions like marketing and manufacturing but instead created separate wholly owned divisions aligned with product or geography, leaving top managers free to take the long, strategic view.

Williamson embraced the M-form idea, and in 1970, he gave it a cybernetic Carnegie interpretation. Citing W. Ross Ashby and Herbert Simon, he understood the M-form as the solution to the “coupling problem” (Williamson 1970, p. 133). As he later rephrased it, the M-form possesses the “capacity to respond to a bimodal distribution of disturbances”: both disturbances in degree and disturbances in kind. It assigns each type of disturbance to its own feedback loop, implying a modularization in which “the higher-frequency (or short-run) dynamics are associated with the operating parts while the lower-frequency (or long-run) dynamics are associated with the

strategic system” (Williamson (1985, pp. 282-283), citing Ashby (1960, p. 131) and Simon (1962, p. 477)).

By the 1970s, Williamson had turned his attention away from questions of the internal structure of firms toward the central Coasean question of vertical integration: why are some activities organized through market transactions and some within firms (or, as Williamson would later characterize them, hierarchies)? In a paper that would set out his research program for the coming decades, Williamson (1971) provided a thoroughly Coasean answer: vertical integration arises because of “market failures,” an echo of Coase’s “cost of using the price mechanism” (Coase 1937, p. 390). Although Williamson widens the ambit of those “failures” to include issues of market power and, influenced by Kenneth Arrow, asymmetric information and moral hazard, his centerpiece explanation of vertical integration remained the same as that of Coase. In a world of change and uncertainty, contracts between cooperating parties are necessarily incomplete, and firms may sometimes be preferable to price-mediated transactions because firms permit an “adaptive, sequential decision process” (Williamson 1971, p. 116). Williamson would dedicate his 1985 *magnum opus*, *The Economic Institutions of Capitalism*, to his greatest influences: Kenneth Arrow, Alfred Chandler, Ronald Coase, and Herbert Simon.

Significantly, although he talked about small-numbers bargaining as early as his 1971 “market failures” paper, and although he introduced the idea of opportunism in his 1975 book, Williamson would not make asset specificity the mainstay of his version of transaction-cost economics until 1979. It is hard not to see this move as a response to the publication of an attention-grabbing paper by Benjamin Klein, Robert Crawford, and Armen Alchian (1978), which shined a spotlight on the problem of potential “holdup” by contracting parties in the face of large

transaction-specific investments.² Writing, like Klein, Crawford, and Alchian, in the *Journal of Law and Economics*, Williamson now insisted that the consensus around transaction-cost economics was made up of four factors: “(1) opportunism is a central concept in the study of transaction costs; (2) opportunism is especially important for economic activity that involves transaction-specific investments in human and physical capital; (3) the efficient processing of information is an important and related concept; and (4) the assessment of transaction costs is a comparative institutional undertaking” (Williamson 1979, p. 239). Asset specificity now occupied the front seat, and the original Coasean understanding had been relegated to the back seat.

Chandler and Williamson intersect.

Chandler knew of Williamson’s 1975 book as he was writing *The Visible Hand*, though he found it “a bit rough going” (Chandler 1982). Williamson participated in a Harvard Business School conference on Chandler’s book in 1977. In his contribution to the conference proceedings, Williamson gently criticized Chandler, not entirely without reason, for ignoring if not minimizing the limits of the visible hand of management in allocating resources. For Williamson, “internalization should not be mistaken for a cost panacea. More generally, the issue is what are the distinctive transaction-cost properties of different types of forward integration and how do these relate to product and customer characteristics?” (Williamson 1980, p. 195).

Chandler and Williamson soon intersected again, at the 1982 meeting of the Business History Conference, where both authors attempted to assess the contributions each could make to the work of the other. Williamson was in full imperialism mode, arguing that only transaction-cost economics could truly understand organizational change. “If this viewpoint is accepted,” he

² Indeed, Williamson (1975) appears to use the phrase “transaction specific” to refer to factors that do not spill out beyond a transaction as externalities – rather than in the sense of investment in assets valuable only within the transaction.

wrote in the published version of his presentation, “studies of organizational change will need to attend to the underlying attributes of transactions. The three dimensions that I have found useful for describing transactions are (1) the frequency with which they recur, (2) the uncertainty to which they are subject, and (3) the degree to which they are supported by investments in transaction-specific assets” (Williamson 1982, p. 112) By this time, of course, Williamson had fully taken the asset-specificity turn, and he insisted to Chandler that “attention to asset specificity is absolutely critical if headway is to be made in applying transaction-cost arguments to business history events.”

In his response, Chandler gamely did his best to understand the history of the large industrial enterprise in Williamsonian terms.³ Noting, as always, that the large multi-plant firm arose in industries where high throughput and “economies of speed” were essential, he attempted to translate into the “three dimensions” framework he had become familiar with from a working paper version of what would become Williamson (1981). “Thus, in terms of Williamson’s ‘dimensions,’ large industrial firms quickly clustered in those high-volume industries where enterprises handled the greatest number of recurring transactions, where uncertainty of maintaining a continuing flow of recurring transactions created the greatest risk in return on capital invested, and where, therefore, transactions came to be supported by the largest investment in transaction-specific assets” (Chandler 1982, p. 119). He concluded that “the transaction-cost approach provides one of the sharpest, most precise means yet devised to analyze the impact of technological and market changes on the structure of the enterprises and the industries in which

³ For a more recent attempt to apply transaction-cost economics to the rise of Chandlerian firms in the late nineteenth and early twentieth centuries, see Bucheli, Mahoney, and Vaaler (2010).

they operate and to explain why hierarchies replace markets in coordinating the flow of goods through the economy and in allocating resources for future production and distribution” (p. 128).

Yet for the Weberian Chandler, lauding an approach for its sharpness and precision has something of the feel of damning with faint praise. In 1982, Chandler was still attempting to understand and to come to terms with transaction-cost economics. But it was already clear that he was uneasy with the asset-specificity story.

The principal source of this unease was Chandler’s understanding of the process of growth through diversification. It is certainly true, Chandler believed, that, especially in the early days of the rise of managerialism around the turn of the twentieth century, enterprises like Standard Oil had to invest in specialized non-human capital, like large high-throughput refineries. And in making these investments, the large enterprises sometimes gained *first-mover advantages*, a term Chandler would eagerly appropriate from Williamson and use prolifically, for good and for ill, from then on. Just as significantly, however, the large enterprises also had to invest in specialized human capital and managerial resources. These latter kinds of investments were particularly significant as the large firms began to grow and diversify. “I believe continuing growth of the enterprise through diversification can be more precisely understood in terms of resources utilization than in terms of transaction costs and particularly in terms of the utilization of human resources that were generated through transaction-specific investment” (Chandler 1982, p. 124). For Chandler, an account of the firm centered on “resource utilization” was an old idea, one he had long embraced.

Resources and capabilities.

In the late 1950s, Chandler was not the only one using historical experience to theorize about the business enterprise. At Johns Hopkins University, where Chandler himself would later be

employed, the Austrian-born economist Fritz Machlup had secured a grant from the Merrill Foundation to study the growth of business firms (Penrose 2017, p. 120). This was mostly an empirical exercise, but Machlup assigned his young protégé Edith Penrose to provide some theory. Supported by a grant from the Foundation for Economic Education, Penrose spent the summer of 1954 embedded at the Hercules Powder Company (Penrose 1960). One of the powder companies spun off in the court-ordered breakup of Du Pont in 1911, Hercules had become a large, successful maker of chemicals and related products. Penrose's understanding of the nature and growth of the firm would spring from this inside view of corporate decision-making (Kor and Mahoney 2000). In 1959, she produced *The Theory of the Growth of the Firm* (Penrose 1959). Whereas Chandler was looking broadly across firms in order to draw conclusions about structure, Penrose was burrowing deeply into a single, and in some ways representative, firm in order to understand the nature of decision-making.

The firm, Penrose concluded, is distinguished from the market in that it is an administrative organization, one whose coherence as an entity emerges from the *collection of productive resources* it employs. The “primary economic function of an industrial firm is to make use of productive resources for the purpose of supplying goods and services to the economy in accordance with plans developed and put into effect within the firm. The essential difference between economic activity inside the firm and economic activity in the ‘market’ is that the former is carried on within an administrative organization, while the latter is not” (Penrose 2009, p. 13).

The productive resources within a firm can be tangible or intangible, so long as they are durable resources that continue to generate services over time (Penrose 2009, pp. 21-22). Resources thus include not only plant and equipment but even the human capital of the workers themselves, who can be considered durable assets in the sense that the firm suffers a capital loss

when knowledgeable workers leave the firm. Workers, including managers, acquire human capital over time in contexts that are specific to each firm, which implies that firms assemble unique bundles of resources: firms inevitably differ from one another in what they know how to do well (Penrose 2009, p. 48).

The firm grows to the extent that entrepreneurs, very much including managers within an administrative organization, perceive and seize opportunities to profit from applying the services of the resources the firm has at its disposal. Because resources are lumpy, a firm always has “excess” resources, overheads that it could apply cheaply to new activities. “For the most part, resources are only obtainable in discrete amounts, that is to say, a ‘bundle’ of services must be acquired even if it is only a ‘single’ service should be wanted” (Penrose 2009, p. 60). This means that the growth of the firm is what we would nowadays call path dependent: which resources are available at any time for new uses will depend on resources inherited from the past and thus on decisions made in the past. Growth in this model is thus opportunistic. The firm seeks out new profitable activities that can take advantage of existing excess resources. Of course, existing resources may not be adequate or a perfect fit for the new entrepreneurial activity, which means that the firm will have to create new resources in the process of utilizing old resources. These new resources will also be lumpy, and the firm will then look for more opportunities to use these new resources: and the process will proceed indefinitely, rather like assembling a large jigsaw puzzle.

As Penrose realizes, what she has created is in the end a theory of growth through related diversification. Significantly, she sees “relatedness” not in terms of the produces or services the firm generates but rather the relatedness of the resources it uses to produce. “Each type of productive activity that uses machines, processes, skills, and raw materials that are complementary and closely associated in the process of production we shall call a ‘production base’ or

‘technological base’ of the firm, regardless of the number of types of products produced” (Penrose 2009, p. 97). A firm can have more than one production base, and each production base can generate many different, seemingly unrelated products in multiple markets.

Only when *Strategy and Structure* was near publication did Chandler become aware of the work of Penrose. “While using somewhat different data and asking somewhat different questions, Dr. Penrose’s findings have many similarities with mine. Her superlative study focuses on the economics of growth and not on structure and on its relation to strategy. My empirical data, however, certainly do help to support her theoretical concepts about the growth of the firm which are defined more rigorously than the more impressionistic generalizations developed here” (Chandler 1962, p. 453).

The Penrosean theory of the growth of the firm would be at the heart of Chandler’s *magnum opus*, *The Visible Hand* (1977), which narrates the growth of the large multiunit enterprise in the nineteenth and twentieth centuries and interprets that growth as deeply connected to the rise of the professional manager. Although Chandler thinks that the large firms sometimes took on new activities for “defensive” reasons, he focuses principally on “productive” diversification, which involves precisely the process Penrose described. “Because the large integrated industrial had more and different types of operating units than other kinds of business enterprises, the likelihood that units might be underutilized was greater. It was rare for all units in such an enterprise to be operating at the same speed and capacity. Such disequilibrium provided constant pressure for the growth of the firm” (Chandler 1977, p. 489). Here Chandler footnotes Penrose.

Whereas Penrose’s theory would have little influence initially on economics, including the new institutional economics, it energized theorizing in management. The 1980s were a period in

which American firms were being pummeled by foreign competition and technological innovation. Mere strategic positioning in product markets seemed to be of little avail. Indeed, one of the lessons of Japanese competition seemed to be not that the Japanese were better strategists but that they were simply better at making high-quality, low-cost products. Thus when in 1984 Birger Wernerfelt (1984) proposed an approach to management strategy that came to be called the Resource-Based View (RBV) of the firm, it instantly struck a responsive chord (Mahoney and Pandian 1992). Drawing explicitly on Penrose, Wernerfelt argued that managers and management theorists should worry less about positioning in product markets and pay attention instead to their underlying resources – Penrose’s production bases – as a source of competitive advantage. The RBV came to dominate thinking in strategic management, as managers were told in no uncertain terms to turn inward to the supply side – to stick to their knitting and build their “core competences.”

As a number of authors have pointed out, however, despite the footnotes and references lavished upon Penrose by the RBV, in the end that approach actually incorporates surprisingly little of what was novel in Penrose and strays far less than advertised from mainstream economics (Foss 2002; Rugman and Verbeke 2002). The principal objective of the RBV strategist is to profit from differential rents accruing to superior factors of production whose services are not easily imitated by others (Barney 1991). Although RBV theorists do see a heterogeneity among resources and differences in the costs of acquiring and protecting them, they “forget that it is the actual application in production, and not the mere possession, of resources that creates revenue” (Foss 2002, p. 158). The RBV became a theory of how to manipulate existing knowledge bases to advantage and not – like that of Penrose – an account of the nature and creation of knowledge bases.

Yet other authors were independently developing a theory of decision-making much more in the spirit of Penrose – and arguable of Chandler. Rather than talking about *resources*, these authors developed an account of what they called economics *capabilities*. A major influence on this approach would be the Carnegie School, which, as we saw, Chandler himself had looked to as a possible source of meso-level theory.

A central aspect of Carnegie thinking was its impatience with the economist's conception of rationality: the idea that economic agents can and do reliably survey their surroundings, peer successfully into the future, and make optimal decisions. Rationality in the widest was also arguably at the heart of Chandler's depiction of managerial behavior, especially early in his career. As I have argued at length elsewhere (Langlois 2023), Chandler swam in the post-war stream of American Progressivism that looked admiringly on expertise and "scientific" techniques of management. Although members of the Carnegie School too were most certainly swept up in the larger currents of Cold War rationalism, their inspiration and signature model was not the rational maximizer but the digital computer. Influenced by the computer – and indeed interwoven with the field of computer science – they proposed accounts of rule-like human behavior (Cyert and March 1963; March and Simon 1958). Simon (1956) famously argued that humans are subject to severe cognitive limitations that make it impossible for them constantly to optimize in any strong sense. Humans are "boundedly rational," Simon suggested, and as a result they must often "satisfice" rather than optimize. And satisficing typically means the following of rules in a world too complex for nonstop optimization.

Influenced by the Carnegie School, Richard Nelson and Sidney Winter painted a sophisticated portrait of an evolutionary approach to economics. In their account, both individual agents and organizations follow *routines*, which are rule-like forms of behavior. The forces of

selection then operate on the routines, which serve as the analogue of genetic material: routines are genes (Nelson and Winter 1982, p. 15). Organizations thus appear as a collection of routines – of ways of doing things – that exist independently of the individual personnel who follow the routines. An automobile assembly plant, for example, continues to operate – and learn – even as workers come and go (Levitt, List and Syverson 2013). For Nelson and Winter, routines are organizational memory, “the organizational analogue of individual skill” (Nelson and Winter 2002, p. 30). They dubbed these organizational skills *capabilities*.

As these Carnegie-inspired dissident strands of organizational economics were taking form over the decade of the 1980s, Chandler worked to complete his third *magnum opus*, *Scale and Scope* (1990). The Chandler-Penrose theory of the growth of the firm – and therefore the dimension along which Chandler parted company most clearly from Williamson – would form the central conceptual pillar of the book. By 1992, Chandler (1992) would explicitly reject the Williamson version of transaction-cost economics in favor of the capabilities theory of the firm.

In *Scale and Scope* Chandler extended the ideas of the *Visible Hand* into a comparative space, comparing the growth of large managerial enterprises in the U. S., Britain, and Germany. It also offers something much closer to a *theory* of the large managerial enterprise. A necessary condition, and perhaps even a sufficient condition, for success of such enterprises was a three-pronged investment: in large-scale production facilities to exploit economies of scale and scope; in a national and international marketing network; and in managerial capabilities to monitor, coordinate and plan. These investments allowed the first movers (and the very occasional follower) to compete not through price but through functional and strategic effectiveness. “They did so *functionally* by improving their product, their processes, their marketing, their purchasing, and their labor relations, and *strategically* by moving into growing markets more rapidly, and out

of declining ones more quickly and effectively, than did their competitors” (Chandler 1990, p. 8, emphasis original). And, once again, these investments in what Chandler was already calling *organizational capabilities* set in motion a process of expansion through Penrosean diversification.

Back to Coase.

Thus had the Carnegie School brought forth two related, but in the end distinct, strands of organizational economics: the transaction-cost economics of Williamson, influenced by Coase and Arrovian neoclassical economics, and the evolutionary theory of Nelson and Winter. It would fall to David Teece (1980, 1982), a student of Williamson, to attempt to connect them, bringing the idea of capabilities to bear on the Coasean problem of the boundaries of the firm.

In these early papers, Teece was concerned explicitly with the problem of related diversification – the economics of the multi-divisional and more generally the multi-product firm. And his target was the formal neoclassical model of economies of scope (Panzar and Willig 1977), ideas then salient in the context of the ongoing (and soon-to-be successful) antitrust suit seeking to break up AT&T, a multiproduct firm offering (among other things) both local and long-distance service. The neoclassical model implied that when a cost function displays economies of scope between products, it is more efficient for a single firm to produce everything than for separate firms to produce each product. (So: don’t break up AT&T.) Drawing explicitly on Penrose, Teece reconstructed the idea of economies of scope in terms of knowledge bases that can be shared among seemingly distinct products. And drawing on Coase, he argued that the question of integration – the boundaries of the firm – is a matter of transaction costs not of the production function. Even if there are economies of scope in the production function, distinct activities can nonetheless be managed through contract, or even separate ownership, if transaction costs are low

enough. “Conclusions about the appropriate boundaries of the firm cannot be drawn simply by examining the nature of the underlying cost function” (Teece 1980, p. 225).

Behind this “capabilities” approach to economic organization lay the evolutionary ideas of Nelson and Winter, notably the idea of routines. Sidney Winter defined an organizational capability as “a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type” (Winter 2000, p. 983). Teece would go on to champion the idea of “dynamic” capabilities, by which he means “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece, Pisano and Shuen 1997, p. 516). But as Winter and other evolutionary economists have pointed out, there is a tension between the original Penrose-style notion of capabilities – which Winter calls “ordinary” or “zero-level” capabilities – and the idea of “dynamic” capabilities (Winter 2003). Capabilities arise from the accumulation of experience of a highly specific sort, often embodying tacit or inarticulate knowledge. This makes capabilities sticky. And the very stickiness that makes capabilities valuable is precisely what makes them fundamentally refractory to any higher-level routines one may try to devise for driving change internally within an organization.

One implication is that economic change may come more easily not from within existing firms but from new firms, including new firms spun off from existing firms because the necessary economic change fits poorly with the set of capabilities within those existing enterprises (Klepper 2016). As Schumpeter famously put it, “in general it is not the owner of stage-coaches who builds railroads” (Schumpeter 1934, p. 66).

Indeed, this is a clear limitation of the accounts of both Chandler and Penrose. Both focus on the firm – the large multi-unit enterprise of the mid twentieth century – and theorize about the growth of knowledge within those organizations. In so doing, they minimize, or indeed ignore, the Coasean question of whether the growth of knowledge should take place within the firm at all. In a notable 1992 essay in the *Journal of Economic Perspectives*, Chandler came to grips with the Coasean issue. And in so doing, he put distance between himself and the Williamsonian approach he had once struggled so hard to accommodate. “The basic difference between myself and Williamson,” said Chandler, “is that for him (1985, p. 41): ‘The transaction is the basic unit of analysis.’ For me, it is the firm and its specific physical and human assets. If the firm is the unit of analysis, instead of the transaction, then the specific nature of the firm’s facilities and skills becomes the most significant factor in determining what will be done in the firm and what by the market” (Chandler 1992, p. 86). In abandoning Williamson, Chandler throws in his lot with the evolutionary capabilities theory.

Proponents of the recently formulated evolutionary theory of the firm also see the firm, not the transaction, as the main unit of analysis. That theory, built on the concept of the firm’s activities and growth developed by Alfred Marshall, Joseph Schumpeter and Edith Penrose, was first spelled out by Richard Nelson and Sidney Winter in *An Evolutionary Theory of Economic Change* (1982). As Winter notes (1988, p. 1731), neoclassical “orthodoxy and transactions costs economics place deal-structuring at center stage, and cast the economics of production and cost in a supporting role.” Their emphasis, on the other hand, is placed on production rather than exchange. (Chandler 1992, p. 87.)

Although Chandler sees the histories he has written as consistent with this new theory – that capital-intensive industries might want to internalize more activities than older labor-intensive industries, for example – he does not apply it at a granular level let alone develop it further.

Even before Nelson and Winter had independently worked out a theory of capabilities, George Richardson had already used this terminology in setting forth a Penrosean account that stressed the alternative organizational forms in which knowledge could grow and be housed. In his unjustly neglected “The Organisation of Industry,” Richardson argued that “production has to be undertaken (as Mrs. Penrose has so very well explained) by human organisations embodying specifically appropriate experience and skill.” In his view, “we cannot hope to construct an adequate theory of industrial organization and in particular to answer our question about the division of labour between firm and market, unless the elements of organisation, knowledge, experience and skills are brought back to the foreground of our vision” (Richardson 1972, p. 888). Such “knowledge, experience, and skills” Richardson called capabilities.

Unlike Penrose (and Chandler), however, Richardson explicitly considers ways of creating and coordinating capabilities *outside* of the structure of the firm. A central thrust of Richardson’s argument is that market actors have at their disposal a wide array of coordinating mechanism – what we would now think of as relational contracts and hybrid organizational forms – that lie between the ideal types of the anonymous market on the one hand and the managerial enterprise on the other.

In Richardson’s account, capabilities can be either *similar* or *complementary*. (They can also be completely unrelated, of course.) Capabilities are similar when the knowledge, experience, and skills useful in activity A could be cheaply adapted to activity B. This is the fundamental idea in the Penrose-Chandler account of related diversification. But along a chain of production, capabilities are necessarily complementary to each other – even if they are quite dissimilar. (A simple example: the woodworking skills needed to make rifle stocks are dissimilar from the metalworking skills necessary to turn the barrels; but they are complementary in that both sets of

skills are necessary to making rifles.) “Where activities were both similar and complementary,” Richardson wrote, “they could be co-ordinated by direction within an individual business. Generally, however, this would not be the case and the activities to be co-ordinated, being dissimilar, would be the responsibility of different firms. Co-ordination would then have to be brought about either through co-operation, firms agreeing to match their plans ex ante, or through the processes of adjustment set in train by the market mechanism” (Richardson 1972, p. 895).

As Brian Loasby (1991, p. 81) rightly observed, this approach has the effect of standing on its head the principal presumption of transaction-cost theorists: that the world of contracting is full of “market failures” and that vertical integration is best understood as a low-cost solution to the inadequacies of the market. In fact, the difficulties of managing dissimilar activities within a single organization may outweigh contractual hazards on the whole and militate in favor of widespread disintegration.

Institutional history.

In the years since the early writings of Coase, North, and Williamson, the economics of institutions has exploded in extent and significance. Yet there is no universal agreement on the meaning of an institution. Geoffrey Hodgson defines institutions as “systems of established and prevalent social rules that structure social interactions” (Hodgson 2006, p. 2). Institutional history in something like Alfred Chandler’s sense fits on that broad canvas. Although it may be controversial whether individual “organizations” count as institutions, I think it is unambiguous that the abstract forms that organizations may take are indeed systems of rules that govern social interaction.

What I am suggesting, then, is that we follow Chandler in studying these abstract forms. We should do so using the meso-theory that Chandler himself endorsed: capabilities. But we can

no longer think only about the internal structure of large, multi-unit enterprises. We must begin to think in Coasean terms about the alternative forms in which capabilities are housed: from specialized firms trading on anonymous markets on one extreme to the diversified corporation on the other, with a panoply of hybrid forms (Ménard 2021) in between.

More than this, we need a way to think about organizational choices in an uncertain and changing environment. Because capabilities can usually be acquired only slowly over time, we cannot presume that organizations – or markets – already have the necessary capabilities at hand. Sometimes, of course, capabilities (or, rather, their services) can be bought readily on a market. But, especially in the face of change and innovation, new capabilities must often be called into existence at a cost. Those costs – the (opportunity) costs of not having the capabilities you need when you need them – are what I call *dynamic transaction costs* (Langlois 1992).

In the early twentieth century, the Ford Motor Company became the poster child for vertical integration, especially with the completion of the massive River Rouge plant. Williamson (1985, p. 119) viewed much of this as “mistaken integration”: integration that, he was sure, a competitive selection process would eventually weed out. And, indeed, after World War II Ford began to divest itself of its founder’s wilder forays into vertical integration, including a Brazilian rubber plantation and considerable ore holdings (Nevins and Hill 1962, p. 323). Yet if we look closer at the core business of Ford Motor company, beginning with its development of the moving assembly line at its Highland Park plant, we see vertical integration that was arguably both efficient and motivated by dynamic transaction costs (Langlois and Robertson 1989). Because the Ford team was at the cutting edge of making parts finely adapted to the Model T, it was often cheaper to manufacture equipment in-house than for the company’s engineers to explain to outsiders what was needed (Hounshell 1984, p. 231). More importantly, the Ford engineers frequently didn’t

immediately *know* what they needed. They were experimenting and trying new things; and being able to survey the entire operation systemically often led to unexpected improvements.

If all production knowledge were explicit and encoded in blueprints, it should never be costly to inform and persuade outside suppliers. Indeed, innovators should always be concerned only with protecting their ideas, which could easily slip out to competitors at zero marginal cost. And this might be a motive for vertical integration, to the extent that integration is a cheaper or more effective alternative for protecting slippery ideas than intellectual property rights (Teece 1986). As Morris Silver pointed out, however, in the real world quite the opposite is often the case. The innovator's "problem is that he cannot, at reasonable cost, convey his implausible 'secret' to those with the technical capabilities needed to produce the required operations at the lowest cost. Finding himself unable to secure the cooperation of the latter producers, the entrepreneur must direct his finite managerial resources into areas for which he does not have a comparative advantage. This in fact reduces the profitability of his innovation" (Silver 1984, p. 17).

In some instances, then, dynamic transaction costs imply vertical integration. But in other cases, they can lead to vertical *disintegration*. If we start with a world of market transactions, internal organization may sometimes be a speedier way to deal with economic change, especially radical or systemic change. But if we start with a world of internal organization, dynamic transaction costs may make vertical disintegration a cheaper alternative.

The work of Steven Klepper (2016) provides some good examples of why this might be. In his careful, detailed study – what he called nanoeconomics – of technological change in a number of industries, he showed the importance to economic growth of *spinoffs*. Especially in a

regime of rapid technological advance, employees within existing firms often perceive opportunities to do things differently or to take the technology in a new direction, perhaps a more specialized direction. But, just as Silver's market entrepreneurs find it costly to persuade transaction partners, Klepper's internal entrepreneurs find it costly to persuade managers to take up their ideas. Indeed, given the existing matrix of capabilities within the firm, the managers may be right to say no. So, assuming market-supporting institutions (like financial markets) are robust enough, the internal entrepreneur strikes off on his or her own to start a new firm. Klepper goes so far as to argue that it is spinoffs, not Marshallian external economies per se, that explain the phenomenon of industrial districts like Silicon Valley or Detroit in the early years of the auto industry.

Conclusion.

This paper revisits the intellectual intersection between Alfred Chandler's institutional history and Oliver Williamson's New Institutional Economics (NIE). Despite shared roots in the Carnegie School and post-war managerialism, Chandler and Williamson approached corporate modeling differently. Chandler's discomfort with NIE, especially its reliance on transaction costs and asset specificity, prompted him to support the capabilities approach. Yet, by focusing on the firm as the unit of analysis, Chandler minimized the key insight of Coase: that both firm and market matter, as do hybrid possibilities between firm and market. Instead of looking solely at the institution of the business firm we need to look at the full ecology of firm and market. We need to apply to this larger ecology the same intense scrutiny that Chandler focused on the multi-unit enterprise. And we need to frame our history not in terms of the rational calculation of managers but in terms of the dynamics of knowledge formation and growth in a changing environment.

What we need is an evolved post-Chandlerian business history approach that synthesizes insights from Weber, the Carnegie School, Coase, and evolutionary economics. Such an approach would focus on the institutional contexts in which organizational capabilities arise and evolve, acknowledging various governance structures from market transactions to hierarchical firms and hybrid arrangements. It would require examining the dynamics of knowledge formation, capability growth, and organizational boundaries within changing environments, incorporating both Chandlerian capabilities and Coasean transaction-cost considerations.

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