SMALL MEDIUM LARGE

How Government Made the U.S. into a Manufacturing Powerhouse

COLLEEN A. DUNLAVY

Small, Medium, Large

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To
Lena Andersson-Skog
Linda Gordon
Jürgen Kocka
and
Merritt Roe Smith
for your inspiration and support
over the years

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Preface and Acknowledgments

Every historical study has its own history. Sometimes an alert historian detects contradictions in previous studies that cry out for further research. Other times, a research project springs from the historian's personal experience or identity. In yet other instances, contemporary issues (e.g., climate change) raise questions that previous generations of historians have not considered. Occasionally, one research question, through engagement with evidence, morphs into a quite different question. And sometimes sheer serendipity – the chance encounter – provokes fruitful new questions.

Serendipity sparked this study of standard sizes and the government's role in pushing manufacturers toward mass production from the Great War (1914–18) through the 1960s. When I was engaged in research on another topic altogether, I came across a paragraph in a published primary source that startled me. "Hmmm," I thought, "that's weird." In a brief passage, the writer reported that manufacturers, under pressure from the War Industries Board during the Great War, had reduced the diversity of products they made in order to shift to mass-production methods. But, when the war ended, they reversed course and re-diversified their product lines – "return[ing]

to the old uneconomic conditions of over-diversity,"[1] as the writer put it. He then described a federal government initiative to get them back on track toward mass production by forging nationwide agreements on standard sizes. Thanks to research that my students had done over the years on surgical instruments and agricultural implements,[2] I knew about government officials' efforts during World War I to shift manufacturing to a mass-production basis. But, having learned how to mass produce, manufacturers reversed course? Reducing the scale of production to make a greater variety of products on a smaller scale? As a historian of business and technology, I knew full well that history is not linear, that economic history has been full of branch points and alternative paths, that the benefits of mass production are context-dependent. But, still, trying and then rejecting mass production? Reversing course altogether? And a government program to entice them back to mass production? I was startled. Thus began the research presented in this little book.

The history of standard sizes presented here may startle some readers, too. Those who are not well acquainted with the history of government and the American economy may regard it as an aberration, a striking departure from long-term trends. As decades of research suggest, however, the government's role in pushing American business toward mass production is fully consistent with the long sweep of U.S. history. Also, those who discern the novelty in the history presented here might assume that it is grounded in newly discovered archival sources. Not so, for this is a history that has been hiding in plain sight – in the wealth of published primary sources that form the foundation for this study.

My original intention was not to publish a book at all. Initially, I envisioned a journal article on U.S. Secretary of Commerce Herbert Hoover's Division of Simplified Practice and its push for mass production in the 1920s, a stand-alone piece that would alert business historians to this pivotal but

overlooked episode in American history. As the 1920s story took shape, however, I realized that I needed to deepen the context on both the front and back ends – by exploring product diversity before the war and World War I efforts to reduce diversity, as well as the long-term durability of the initiative, visible all around us today in a plethora of familiar standard sizes. And so it grew beyond the confines of a journal article.

To keep the book sharply focused on the origins of standard sizes in the U.S., I have left it for others to place this story in comparative perspective. As a comparative historian myself, I was sorely tempted to compare the American story with experience elsewhere – in Britain, which was at the forefront of standardization in other ways, but not this one; in Germany, where World War I launched a similar standardization movement that included product sizes; and in France, always a fascinating outlier in industrial history. Sweden would likely make a fruitful addition to the mix. And then there is the intense competition in the 1920s over whose national standards would prevail in which markets around the globe. As a moment's reflection on the diversity of bed sizes or electrical outlets from nation to nation confirms, competitive forces won out; such products were never standardized globally. But I have resisted those temptations and kept my focus squarely on the U.S. Commerce Department project, which did what "market forces" could not do – turned the United States into a manufacturing powerhouse.

Pursuing the project in fits and starts over the past decade and a half, I have benefited from the insights and generosity of a host of colleagues and students with congruent interests in political economy. The story first took shape in my lectures on the history of American capitalism at the University of Wisconsin–Madison, in a newspaper article some 15 years ago, and then as a conference paper presented at the annual meeting of the Business History Conference in June 2015. I am grateful to my fellow panelists Stephen Mihm, Laura Phillips Sawyer,

and David F. Weiman, and to the session attendees for helpful and encouraging comments. Thanks, also, to Caitlin Rosenthal and Espen Storli for inviting me to present the lumber portion of the story to a stimulating mix of American and Norwegian scholars at the University of California, Berkeley, in November 2015. Although I ended up using Commerce Department files at the National Archives and Records Administration in College Park, MD, I am obliged to archivist Craig Winter for his willingness to review selected folders for me at the Herbert Hoover Presidential Library and Museum during the Covid pandemic. Over the years, my thinking about simplified practice has been shaped by fruitful conversations with a host of others: Idit Ben Or, Regina Blaszczyk, Alexia Blin, Suzanne Desan, Pierre-Christian Fink, Barbara Forrest, Walter Friedman, Pierre Gervais, Linda Gordon, Allen Hunter, Camden Hutchison, Kenneth Lipartito, Marina Moskowitz, and Daniel Raff, and Steve Usselman. For thorough readings of the manuscript and ever astute com-ments, I owe an eternal debt to Florence Bernault, Pamela Laird, Jürgen Kocka, Mary O'Sullivan, Merritt Roe Smith, and Kathleen Thelen. Any errors of fact or interpretation are, of course, my own. To Ian Malcolm and staff at Polity Press, my gratitude for their enthusiasm and expert support. And, finally, to my beloved partner in life's adventures, Ron Radano, many thanks for your patience with this and all else.

1

The Puzzle of Standard Sizes

"Standard sizes" are familiar, ubiquitous, taken for granted in modern consumption. Consider bed frames and mattresses. Shoppers today know without thinking that both bed frames and mattresses are offered in the same small number of standard sizes and that, say, an American queen-sized mattress will fit an American queen-sized bed frame.[1] Consumers need only decide which standard size is right for them. Likewise with electrical plugs and outlets: American consumers share the tacit knowledge that the plug on an electrical device bought in the U.S. will fit into the electrical outlets of an American home (though not necessarily into outlets in another country). And they can comfortably assume what was not always the case: a randomly purchased roll of toilet paper will fit (in width at least) their toilet paper holder. Many everyday goods from batteries to printer paper are commonly available in a limited number of standard sizes, lending an extraordinary homogeneity to modern consumption. Behind the scenes, rarely visible to the ultimate consumer, lie even more standard sizes – in factory fittings, building materials, plumbing fixtures, and the like.

What makes standard sizes "standard" is that dozens, if not hundreds, of different firms manufacture everyday products

in the same, limited set of sizes and shapes. In other words, they are standardized across firms. This means that competing firms carry the same sizes and shapes "in stock," readily available, while other sizes or shapes must be special-ordered, and cost more, if they are available at all.[2] Leaving out of consideration those consumers who preferred or needed something other than the standard sizes, mass producers, distributors, and retailers, in effect, as a notable expert put it, "standardized the customer."[3]

How did it come to be that competing mattress manufacturers – some 400 establishments in the U.S. as of 2019[4] – all offer consumers the same small number of "standard" mattress sizes? Once a collective agreement on standard sizes has been achieved, of course, firms have strong incentives to focus their production on those standard sizes so that customers can easily find a mattress to fit their bed frame, and bed sheets to fit their mattress. But how and when did industry-wide standard sizes come to be established in the first place?

Collective agreements on a national scale do not arise spontaneously or naturally; they must be forged.[5] An individual manufacturer, to be sure, had to limit its production to a few sizes or styles in order to produce those few sizes or styles in large volume. (Thus, the U.S. War Department's first step in developing the keystone of mass production, interchangeable-parts manufacturing technology, after the War of 1812, was to decide which single musket to produce.[6]) If a firm enjoyed a position of overwhelming market dominance, its standard sizes or styles, decided upon unilaterally, might become de facto nationwide standards. But, in general, an individual manufacturer's "standard" products were unlikely to be identical to those of their competitors. Indeed, they were quite likely to be different, if differentiating products in size or style was a way of avoiding price competition with one's competitors. In the 1920s, standard sizes, the National Industrial Conference Board observed, were "confined almost entirely within the

limits of the individual establishment. . . . [I]n the absence of combination, the tendency to standardization does not reach beyond the bounds of the several producing organizations."[7] A bed manufacturer concurred: "Individual bed manufacturers did not lack standards for themselves. That wasn't the trouble at all. But they were all individual standards, perfectly useless so far as other bed manufacturers were concerned."[8] Reducing product variety *across firms*, in other words, required "combination," a collective agreement among many competing firms. It did not happen naturally. Quite to the contrary, collective action posed formidable challenges in fragmented industries, marked by many buyers and many sellers, all the more so if their suppliers and customers also had to be brought on board.[9] How, then, did direct competitors – companies all producing or selling the same line of goods – set aside often intense competitive pressure (not to mention legal constraints) and forge collective agreements on standard sizes?

The mystery deepens when one considers the speed with which standard sizes emerged in the 1920s. In 1919–21, surveys showed, some 900 American manufacturers made bedsteads, springs, and mattresses in 78 different sizes,[10] a diversity that seems unimaginable today. In 1922 an industry-wide agreement reduced those 78 sizes to 4 standard widths and 1 standard length.[11] Within a decade, some 90 percent of the nation's output of beds, mattresses, and springs conformed to the new standard sizes.[12] In the meantime, this "simplification" of household mattress and bed sizes, as it was called, spurred nationwide agreements to simplify hospital beds (from 33 lengths, 34 widths, and 44 heights to 1, 3, and 1, respectively) and blanket sizes (from 78 to 12).[13] By the end of the decade, standard sizes had been established for more than 100 commodities – from sterling silver flatware, writing paper, jelly jars, shovels, grocery bags, and milk bottles to bank checks, warehouse forms, restaurant checks, and a variety of tools and building materials.[14]

How did this nationwide transformation – the simplification of everyday goods that we now take for granted – come about so swiftly and thoroughly? As a starting point in working out this puzzle, it would be helpful to know more about the diffusion of mass-production techniques among smaller manufacturers after the turn of the twentieth century. But, despite reams of research on the history of mass production and distribution, it remains a mystery, for historians have neglected to ask how those techniques, after Henry Ford's remarkable achievements with the Model T in the 1910s,[15] were taken to the next level, diffusing throughout the American economy over the middle decades of the twentieth century.

Historians' inattention to the diffusion process stems from the narrative framework that has guided scholarship in American business history for decades. This framework is anchored in a dichotomy between small-scale producers of luxury products and large-scale manufacturers producing low-priced goods in "landmark factories," to borrow Joshua Freeman's term.[16] In her now-classic study of the Great Merger Movement, Naomi Lamoreaux put the dichotomy succinctly: "In the United States during the late nineteenth century, most firms adopted one of two basic strategies. Either they manufactured small quantities of carefully differentiated, high-quality products, or they mass-produced a cheap homogeneous output."[17] There is no room in this interpretive framework to ask how mass-production techniques might have diffused among middling manufacturers.

Structured by this framework, business historians confined their attention to one or the other side of the dichotomy. Under the sway of Alfred D. Chandler, Jr.'s influential studies of mass production and distribution, they initially focused on "big business" – on leading manufacturers and retailers in the late nineteenth and early twentieth centuries. The Chandlerian narrative centered on the growth of large integrated firms and salaried managers exploiting growing national markets.[18] Then,

in the 1980s, scholars turned to the other end of the spectrum, to small business and specialty production in the age of mass production – what Philip Scranton termed the "other side" of Chandler's story.[19] Scranton's pathbreaking empirical studies explored specialty or batch production, which entailed small runs of a diversity of products made by networks or clusters of specialty firms. Such firms, he showed, constituted a vibrant element of the American manufacturing landscape through the turn of the twentieth century.[20] In *Endless Novelty*, moreover, he blurred the line between large-scale, mass-producing firms and small-scale, specialty firms by showing that specialty production was associated not only with small firms but also with "giant enterprises making the 'big stuff' of America's infrastructure (locomotives, heavy machinery)."[21] Scranton rightly dates the decline of specialty production in the U.S. to the 1920s and attributes it both to government policies that valorized price competition over product diversity and to changing distribution practices,[22] an interpretation consistent with the fuller story told here. But neither Scranton nor other scholars who pushed back against an excessive focus on big business have explored the diffusion of mass-production techniques among middling manufacturers,[23] a process that would have required them to standardize – "simplify" – their own product lines and might conceivably have laid a foundation for nationwide standard sizes.

As the twenty-first century opened, business historians could be forgiven for thinking that little remained to be discovered about the history of mass production and distribution. "Big business" no longer elicited a frisson of excitement; the literature on its counterpoint, flexible specialization, had matured. Research interests, increasingly inflected by social and cultural history, turned to a host of other topics such as finance and fraud, insurance, family firms, slavery, and race and gender.[24]

Looking in other directions, we might seek help in understanding the origins of standard sizes from scholars who have

studied the broader standardization movement or the career of Herbert Hoover, who, as we will see, was pivotal in pushing mass-production methods as Secretary of Commerce in the 1920s. For most students of the standardization movement, however, standard product sizes and styles constitute little more than a footnote to the larger story, which concerns technical standards (e.g., weights and measures, screw threads, electrical units).[25] The most recent studies, moreover, focus not on the standards themselves but on professional engineering associations and prominent engineers as the key actors in the standardization movement, and on the development of consensual processes for establishing technical standards.[26] JoAnne Yates and Craig N. Murphy's *Engineering Rules*, for example, while impressive for its international sweep, categorizes standards in terms that seem to exclude product sizes and shapes.[27] Most studies of Herbert Hoover's tenure as Secretary of Commerce, meanwhile, offer only brief descriptions of the simplification initiative as one piece of his larger "war on waste."[28] One exception is William R. Tanner's more in-depth study of Hoover's simplification initiative, and he does note, in general terms, that it "encouraged the increased use of new technologies for mass production."[29] On the whole, however, studies of Hoover offer little insight into the diffusion of mass-production techniques, whether as a prelude to his initiative or as a consequence.

As it presently stands, historians, with their passing references to the "uniform products" or "standardized consumer goods" pouring out of factories,[30] leave us with the impression that the diffusion of mass-production techniques in the 1920s – the making of the U.S. into a "Fordist" nation of mass producers and consumers – was a natural process of emulation and learning, set in motion by Henry Ford's astonishing accomplishments. The foremost historian of the technology underlying mass production, David Hounshell, is explicit about this. "As a consequence of Ford's openness," he writes,

"Ford production technology diffused rapidly throughout American manufacturing. . . . The Ford Motor Company educated the American technical community in the ways of mass production."[31] He bases this assertion, which has worked its way deeply into the historical literature,[32] not on case studies of firms adopting Ford's methods – actually putting his lessons into practice – but on the widespread attention that Ford's accomplishments attracted in trade journals. There is no denying that Ford's methods garnered widespread media notice, but what did American manufacturers do with that knowledge? Lacking direct evidence of diffusion, scholars rely on statistics and inference to discern its outlines in the 1920s. "That other industries also adopted the assembly line was evident from a startling statistic," David Nye writes in *America's Assembly Line*. "[D]uring the 1920s the number of [factory] workers remained static," he notes, while manufacturing "output soared."[33] Clearly, something changed in the 1920s.

Assume for a moment that Hounshell is right: American manufacturers did indeed learn how to mass produce by reading reports in the press on Ford's accomplishments or by touring his factory. Once individual manufacturers learned to mass produce, one might be tempted to assume, they simply took the logical next step, moving *collectively* to limit their product lines to the same set of "standard" products. Indeed, a contemporary observer described the process in just these terms – as a natural, rational evolution toward nationwide product standards. "These examples of standardization – of lamp bases and of lighting voltages," General Electric's M. D. Cooper observed in 1923, "are typical of the normal course of development and perfection of an industry." Increasing product diversity, with its added costs, uneven quality, and logistical challenges, prompted what he characterized as "a general demand for standardization." Manufacturers rose to that challenge, agreeing to produce the same limited number of product sizes and

shapes for the convenience of all.[34] A truly heroic achievement, if it happened that way.

But did it? There is more to Cooper's story than evolving knowledge and manufacturers stepping up to meet "a general demand for standardization." Electric lamp manufacturing was dominated by his company, General Electric (GE), which put it in a market position to set nationwide standards for electric lamp bases. By 1900, some 70 percent of lamps had GE's Edison screw base.[35] Which meant, of course, that some 30 percent of lamps had other types of bases. Even in this special case – an industry dominated by a single manufacturer – achieving the full standardization of lamp bases to which we are accustomed today required a boost from the federal government in its role as a large consumer. In 1907, after negotiations with electric lamp manufacturers and various federal agencies, the U.S. Bureau of Standards issued detailed "specifications" to cover the federal government's purchases of electric lamps. The first edition specified the Edison screw base.[36] As a recounting of this history in a Bureau publication in the 1920s noted, "The great variety [of electric lamps] then in use was promptly simplified to a moderate number adequate for all needs."[37] The editor of *Scientific American* concurred: "Once upon a time there were over 150 different styles of electric-lamp sockets. In buying a new bulb it was almost necessary to take your socket out and carry it to the store, to be fitted with a bulb. Today a lamp bought anywhere fits, automatically, a socket bought anywhere else."[38]

If even a monopolistic industry needed an assist from the federal government to establish nationwide standards, how did fragmented industries manage to do so in the 1920s? A multitude of middling concerns – established companies accustomed to manufacturing a diversity of everyday commodities in modest volumes, often tailored to their customers' specifications – surely pondered the risks of emulating Ford's model.[39] The basic question was whether they, individually,

should radically reduce the variety of products they made in order to scale up for mass production, as Ford had in the first decade of the twentieth century, and risk losing customers to competitors who continued to offer just what the customer wanted.

The history recounted in the following chapters shows that the key to the puzzle of standard sizes lies neither in learning nor in manufacturers' voluntary response to a "general demand for standardization," but in the interplay of economics and politics in the diffusion process itself. As a wealth of commentary in trade journals and the like makes clear, formidable market forces blocked the diffusion of mass-production techniques among smaller manufacturers. It was only under the cover of nationally agreed-upon standard sizes that they broke free of market forces and transitioned to mass production. And, as we will see, it was initially the Great War and, in the 1920s, Secretary of Commerce Herbert Hoover and his Division of Simplified Practice that provided the impetus and the necessary cover, an achievement that would arouse interest worldwide.

Our starting point is the incredible diversity of everyday commodities in the U.S. on the eve of the Great War and the strategic dilemma that this posed for middling manufacturers contemplating mass production (chapter 2). This dilemma was resolved abruptly, if temporarily, by the United States' entry into the war (chapter 3). In a forceful campaign, wartime officials, led by Arch Wilkinson Shaw of the War Industries Board's Conservation Division, pushed manufacturers of diverse products to simplify their product lines so that they could shift to mass-production methods and thus conserve materials, labor, and transportation for war uses. The pivotal moment came when the war ended – a brief interlude that exposed the unnaturalness of the wartime push for mass production (chapter 4). With wartime controls lifted and manufacturers facing consumer resistance in a "buyer's strike,"

followed by the sharp depression of 1920–1, many wartime mass producers set aside what they had learned in the war and reverted to their old ways, re-diversifying their product lines as a tried-and-true competitive strategy to capture the reluctant consumer's dollar. It was this reversal that prompted Secretary of Commerce Herbert Hoover to revive the wartime program in a form tailored for peace (chapter 5). Under the protective umbrella of government-sanctioned collective agreements among competitors to limit product diversity, mass-production techniques diffused rapidly and broadly across the American economy from the 1920s through the 1950s (chapter 6). Had the federal government not enabled American business to push back against market forces, the story of standard sizes suggests, mass-production techniques would not naturally have diffused as far and as fast as they did in the United States. Absent, in the words of a British admirer, "Hoover's fostering hand,"[40] the twentieth-century American variety of capitalism would have looked markedly less "Fordist."[41]

Afterword

The story of standard sizes requires us to think differently about the United States' status as a manufacturing powerhouse in the twentieth century. The diffusion of mass-production techniques across the American economy was not, as conventional wisdom would have it, a natural, evolutionary process of entrepreneurial emulation and learning. To be sure, the extraordinary success of the titans of mass production such as Andrew Carnegie (steel), James B. Duke (tobacco), and, above all, Henry Ford (automobile manufacturing) demonstrated the economic bounty that *could* be reaped by manufacturing a sharply restricted stable of products in massive volumes. But neither the models of large-scale production they offered, nor wartime lessons in simplification, were enough to diffuse mass-production methods throughout the economy. In many lines of business, relentless competitive pressures to offer consumers a diversity of products stymied the diffusion process. Only when the federal government stepped back in again after the war, encouraging and enabling American manufacturers to push back collectively against market forces, did mass-production techniques diffuse quickly and broadly across the economy, positioning the United States

to become a global manufacturing powerhouse by the mid twentieth century.

Should we be surprised that the prominence of mass production and consumption in the mid-twentieth-century American economy, captured in the term "Fordism," can be laid at the feet of the federal government rather than entrepreneurs? Yes – but only if one gauges the government's role in the economy through a restricted conceptual lens that focuses solely on "regulation." Widen the conceptual lens, however, and regulation's counterpart, government "promotion," suddenly springs into view. Where government regulation seeks in some way to constrain business activity, government promotion does the opposite: it encourages and supports business activity. Promotion takes one of two forms. In its *constitutive* guise, government promotion provides the institutional framework that makes capitalist enterprise possible by lowering risk. It specifies property rights – both who can own property and what can be owned; it sets legal requirements for forming corporations and may limit the liability of their investors; and it enforces contracts.[1] In what one might call its *fostering* form (perhaps more familiar as "industrial policy"), government promotion encourages and supports particular sectors, industries, firms, or activities. This may entail direct investment in, or interest guarantees for, private enterprise; protection from foreign competition (e.g. tariffs); the offering of bounties, prizes, or research grants; and so on.[2]

In its fostering form, American promotion of enterprise has a long, unbroken history that extends back to 1789, when the second and third acts of the first U.S. Congress placed import duties on specific manufactured goods and levied tonnage taxes favoring American-owned ships.[3] It has continued without interruption through two centuries in an ever-changing mosaic of federal, state, and local government policies to foster American enterprise – a panoply of policies that would be tedious to enumerate here.[4] In the 1980s, state and local

promotion again became more salient, as they had been in the nineteenth century, while federal policies receded from view, decentralized and "hidden."[5] But the Biden administration, with its federal subsidies for chip manufacturing and green technologies, has once again brought federal policies to foster enterprise back to the fore.[6] Like Hoover's pursuit of simplified practice, the overarching goal of fostering policies is to enhance Americans' standard of living. Notwithstanding persistent mythmaking about laissez-faire in American history, and regardless what role one thinks government *should* play in economic change, the reality is that all levels of the American government – federal, state, and local – have promoted business enterprise throughout the nation's history.

As a premier example of federal efforts to foster business enterprise, the story of standard sizes fits comfortably within – and enlarges – this rich and fulsome history. In all, at least a full century of government promotion elevated mass production to its dominant position in the American economy – a half-century of Army Ordnance Department support for nascent mass production before the Civil War,[7] plus a second half-century in which the World War I War Industries Board, Hoover's "fostering hand" in the Commerce Department, and the World War II War Production Board pushed energetically to diffuse mass-production techniques across the economy. To this, one can also add an intervening half-century of federal policies between the Civil War and the Great War that created the mass markets on which mass production was premised (think of Indian removal, land grants, transcontinental railroads, nationally chartered banks, protective tariffs). Without sustained government promotion over one and a half centuries, it seems fair to conclude, mass production would not have become so quintessentially "American" by the mid twentieth century.

The history of standard sizes in the U.S. raises, in my mind, a host of intriguing questions that I encourage others to explore.

How did individual firms negotiate, in Hartmut Berghoff's words, that "fundamental dilemma of industrial capitalism"[8] – the tension between the factory, prioritizing volume production, and the sales department's or consumer's demands for product diversity? How did simplified practice agreements affect the structure of industry – did they work to the advantage of already dominant firms, or did they, as Herbert Hoover hoped, provide a framework to support small and middling manufacturers in an age of big business? Did standard sizes actually limit consumer choice in the vaunted age of consumerism? To what extent was mass advertising used not merely to ramp up consumer demand but more specifically to quash demand for non-standard products? If collective agreements on standard sizes drove the diffusion of mass-production techniques in the 1920s, does this help to explain the puzzling surge in productivity in that decade? Did the diffusion of mass-production techniques enhance a growing mismatch between production and consumption, deepening the Great Depression? To what extent do early twentieth-century worries about "waste" resonate with present-day environmental concerns? And, finally, absent simplified practice, would the American "variety of capitalism" have more closely resembled the German or British at mid-century?

Notes

A Note on Citations

Citations to simplified practice recommendations, commercial standards, and voluntary product standards appear in shortened form in the notes. The full citation of the first simplified practice recommendation, for example, would be: U.S. Department of Commerce, *Simplified Practice Recommendation No. 1: Paving Bricks, Issued by the Bureau of Standards, Fourth Revision, May 1, 1925* (Washington, DC: Government Printing Office, 1925). In the notes, it appears as *SPR No. 1: Paving Bricks* (1925). The numbers given to commercial standards were preceded by CS and followed by the two-digit year in which they took effect. The full citation to the first commercial standard is: U.S. Department of Commerce, Bureau of Standards, *Clinical Thermometers: Commercial Standard CS1-28, Effective Date, October 1, 1928* (Washington, DC: Government Printing Office, 1928). It is cited in the notes as *CS1-28: Clinical Thermometers* (1928). Beginning in 1928, a similar numbering convention was used for simplified practice recommendations – e.g., *SPR No. 1* became *SPR R1-29* when it was revised in 1929. Voluntary product standards, a unified series introduced in 1965 with numbers beginning PS, are shortened in a similar manner. The year in parentheses in the short citations is the year of publication. As official

government publications, the printed standards were sent to federal depository libraries, but they have not necessarily been retained. Fortunately, many are available online. The most complete collection, to my knowledge, is on HathiTrust (www.hathitrust.org).

To conserve space in the endnotes, periodical databases are cited by name only. The relevant URLs are:

America's Historical Newspapers, www.readex.com/products/americas-historical-newspapers

Chronicling America: Historic American Newspapers, Library of Congress, https://chroniclingamerica.loc.gov

ProQuest *Harper's Bazaar* Archive, https://about.proquest.com/en/products-services/Harpers-Bazaar-Archive

ProQuest Historical Newspapers: *The New York Times*, www.proquest.com/scholarly-journals/proquest-historical-newspapers-new-york-times/docview/217892515/se-2

ProQuest *Vogue* Archive, https://about.proquest.com/en/products-services/vogue_archive

ProQuest Women's Magazine Archive, https://about.proquest.com/en/products-services/Womens-Magazine-Archive

ProQuest *Women's Wear Daily* Archive, https://about.proquest.com/en/products-services/www</UL>

Preface and Acknowledgments

1 Ray M. Hudson, "Organized Effort in Simplification," *Annals of the American Academy of Political and Social Science* 137, Standards in Industry (May 1928): 1.

2 Eric Boyles, "Changes in the American Surgical Industry during the Great War" (independent study paper, Department of History, University of Wisconsin–Madison, 1989); Glen Asner, "The Politics of Mass Production: Government Promotion of Standardization during the First World War" (B.A. thesis, University of Wisconsin, 1993), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3276703.

1 The Puzzle of Standard Sizes

1 "Mattress Sizes," SleepFoundation.org.

2 See, for example, *SPR No. 22: Paper* (1924), 3, which lists "stock sizes" of paper for general printing and publishing, for book publishers, and for forms and letterheads.

3 James Couzens, "What I Learned about Business from Ford," *System* 40, no. 3 (September 1921): 263–4.

4 In 2019, according to the U.S. Census Bureau, 401 establishments manufactured mattresses (NAICS 337910). See County Business Patterns (*CB1900CBP*), 2019, https://data.census.gov/cedsci/table?q=naics%20337910&tid=CBP2019.CB1900CBP.

5 On collective action, the classics are Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups* (Cambridge, MA: Harvard University Press, 1965), and Claus Offe and Helmut Wiesenthal, "Two Logics of Collective Action: Theoretical Notes on Social Class and Organization Form," *Political Power and Social Theory* 1 (1980): 67–115. On capitalists, see John R. Bowman, *Capitalist Collective Action: Competition, Cooperation, and Conflict in the Coal Industry* (Cambridge, UK and New York: Cambridge University Press; Paris: Éditions de la Maison des sciences de l'homme, 1989); Luca Lanzalaco, "Business Interest Associations," in Geoffrey Jones and Jonathan Zeitlin, eds., *Oxford Handbook of Business History* (Oxford University Press, 2008), 293–315; and Kathleen Thelen, "Employer Organization and the Law: American Exceptionalism in Comparative Perspective," *Law and Contemporary Problems* 83, no. 2 (2020): 23–48. On the relationship between national political structures and the propensity and ability of firms to engage in collective action nationwide, see Colleen A. Dunlavy, *Politics and Industrialization: Early Railroads in the United States and Prussia* (Princeton University Press, 1994), 145–201. In the 1920s, the term "concerted action" (or "concert of action") was used more often than "collective action," which (according to Google's Ngram Viewer) became the dominant term only from the late 1980s.

6 Merritt Roe Smith, *Harpers Ferry Armory and the New Technology: The Challenge of Change* (Ithaca: Cornell University Press, 1977), 107.
7 National Industrial Conference Board, *Trade Associations: Their Economic Significance and Legal Status* (New York: National Industrial Conference Board, 1925), 180.
8 George G. Powers, "We Cut Factory Overhead despite Smaller Volume," *Factory* 28, no. 3 (March 1922): 276. Powers was Vice President and Treasurer of the Union Bed and Spring Company.
9 David Hemenway, *Industrywide Voluntary Product Standards* (Cambridge, MA: Ballinger Publishing Co., [1975]), 24. See also David F. Noble, *America by Design: Science, Technology, and the Rise of Corporate Capitalism* (Oxford University Press, 1977), 78–9.
10 U.S. Department of Commerce, *Simplified Practice: What It Is and What It Offers: Summary of Activities of the Division of Simplified Practice and Description of Services Offered to American Industries, Issued by the Bureau of Standards, November 26, 1924* (Washington, DC: Government Printing Office, 1924), 6.
11 *SPR No. 2: Bedsteads, Springs and Mattresses* (1922), 3–4; U.S. Department of Commerce, *Simplified Practice: What It Is* (1924), 6. The four standard sizes were reaffirmed in subsequent years with the addition of two larger sizes in the late 1950s and early 1960s because of "the increased height and weight of the population in the United States": *SPR R2-62: Bedding Products and Components* (1962), 17.
12 U.S. Department of Commerce, Bureau of Standards, *Standards Yearbook 1931*, Misc. Pub. No. 119 (Washington: U.S. Government Printing Office, 1931), 246.
13 *SPR No. 24: Hospital Beds* (1925); *SPR No. 11: Bed Blankets: Cotton, Wool, and Cotton and Wool Mixed* (1924); U.S. Department of Commerce, *Simplified Practice: What It Is* (1924), 6.
14 U.S. Bureau of Standards, The Purpose and Application of Simplified Practice, July 1, 1931, mimeograph, Washington,

DC, Appendix C, which listed 121 Simplified Practice Recommendations in effect as of June 1931, and another 17 in the process of acceptance.

15 David A. Hounshell, *From the American System to Mass Production, 1800–1932: The Development of Manufacturing Technology in the United States* (Baltimore: Johns Hopkins University Press, 1984), 217–61; Richard S. Tedlow, *New and Improved: The Story of Mass Marketing in America* (New York: Basic Books, 1990), 112–46.

16 Joshua Benjamin Freeman, *Behemoth: A History of the Factory and the Making of the Modern World* (New York: W. W. Norton, 2018), xiii.

17 Naomi Lamoreaux, *The Great Merger Movement in American Business, 1895–1904* (Cambridge University Press, 1985), 15. See also Thelen, "Employer Organization and the Law," 33. In the 1920s, the head of a New York accounting firm laid out the dichotomy in prescriptive terms – i.e., as one that firms *should* conform to, implying that too many did indeed try to straddle the two types: William R. Basset, *Taking the Guesswork out of Business* (New York: B. C. Forbes Publishing Company, 1924), 39–40; W. R. Basset, "How Far Does It Pay to Carry Simplification?" *System* 40, no. 4 (October 1921): 492, 494.

18 Alfred D. Chandler, Jr., "The Beginnings of 'Big Business' in American Industry," *Business History Review* 33, no. 1 (Spring 1959): 1–31; Alfred D. Chandler, Jr., *Strategy and Structure: Chapters in the History of the American Industrial Enterprise* (Cambridge, MA: Harvard University Press, 1962); Alfred D. Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, MA, and London: Belknap Press of Harvard University Press, 1977); Alfred D. Chandler, Jr., *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, MA: Harvard University Press, 1990). On the impact of Chandler's work, see Thomas McCraw, "Introduction: The Intellectual Odyssey of Alfred D. Chandler, Jr.," in *The Essential Alfred Chandler: Essays Toward a Historical Theory*

of Big Business (Boston, MA: Harvard Business School Press, 1988); Richard R. John, "Elaborations, Revisions, Dissents: Alfred D. Chandler, Jr.'s 'The Visible Hand' after Twenty Years," *Business History Review* 71, no. 2 (Summer 1997): 151–200; Steven W. Usselman, "Still Visible: Alfred D. Chandler's 'The Visible Hand,'" *Technology and Culture* 47, no. 3 (July 2006): 584–96; and "Alfred Chandler Tribute," *Enterprise and Society* 9, no. 3 (September 2009): 405–32. For an overview of the history of "big business" in the U.S., Western Europe, and Japan, see Youssef Cassis, "Big Business," in Jones and Zeitlin, eds., *Oxford Handbook of Business History*, 171–93.

19 Philip Scranton, *Endless Novelty: Specialty Production and American Industrialization, 1865–1925* (Princeton University Press, 1997), 3. The landmark studies were Philip Scranton, *Proprietary Capitalism: The Textile Manufacture at Philadelphia, 1800–1885* (Cambridge and New York: Cambridge University Press, 1983); Michael J. Piore and Charles F. Sabel, *The Second Industrial Divide: Possibilities for Prosperity* (New York: Basic Books, 1984); and Charles Sabel and Jonathan Zeitlin, "Historical Alternatives to Mass Production: Politics, Markets and Technology in Nineteenth-Century Industrialization," *Past and Present*, no. 108 (August 1985). On the subsequent development of this literature, see Charles F. Sabel and Jonathan Zeitlin, eds., *World of Possibilities: Flexibility and Mass Production in Western Industrialization* (Paris: Maison des sciences de l'homme; Cambridge, UK, and New York: Cambridge University Press, 1997); Jonathan Zeitlin, "The Historical Alternatives Approach," in Jone and Zeitlin, eds., *Oxford Handbook of Business History*, 120–40; Gerald Berk, *Louis Brandeis and the Making of Regulated Competition, 1900–1932*, Kindle ed. (Cambridge University Press, 2009); and Laura Phillips Sawyer, *American Fair Trade: Proprietary Capitalism, Corporatism, and the "New Competition," 1890–1940*, Kindle ed. (New York: Cambridge University Press, 2019). For a synthesis of studies of small business, see Mansel G. Blackford, *A History of Small Business in*

America, 2nd ed. (Chapel Hill and London: University of North Carolina Press, 2003).

20 Philip Scranton, *Figured Tapestry: Production, Markets, and Power in Philadelphia Textiles, 1885–1941* (Cambridge University Press, 1989); Scranton, *Endless Novelty*.

21 Scranton, *Endless Novelty*, 21.

22 Scranton, *Endless Novelty*, 340, 348–9.

23 Though their volume focuses on the European experience (its single essay on the U.S. is by Scranton on textiles), Charles F. Sabel and Jonathan Zeitlin, "Stories, Strategies, Structures: Rethinking Historical Alternatives to Mass Production," in Sabel and Zeitlin, eds., *World of Possibilities*, offers a useful conceptual framework for moving beyond the large/small, mass/specialty dichotomy. On American associations of specialty producers as a "third way" between large integrated firms and smaller firms acting independently, see Berk, *Louis Brandeis*; and Sawyer, *American Fair Trade*. On collective bargaining as a strategic response by specialty producers to intense competition in the United States and Germany, see Thelen, "Employer Organization and the Law," 23–48.

24 To gauge the impressive topical range of the recent literature, see Philip Scranton and Patrick Fridenson, *Reimagining Business History* (Baltimore: Johns Hopkins University Press, 2013); Jürgen Kocka and Marcel van der Linden, eds., *Capitalism: The Reemergence of a Historical Concept* (London and New York: Bloomsbury Academic, 2016); Kenneth Lipartito, "Reassembling the Economic: New Departures in Historical Materialism," *American Historical Review* 121, no. 1 (February 2016): 101–39; Walter A. Friedman, "Recent Trends in Business History Research: Capitalism, Democracy, and Innovation," *Enterprise and Society* 18, no. 4 (December 2017): 748–71; Daniel Wadhwani and Christina Lubinski, "Reinventing Entrepreneurial History," *Business History Review* 91 (Winter 2017): 768–99; Sven Beckert and Christine Desan, "Introduction," in *American Capitalism: New Histories* (New York: Columbia University Press, 2018), 1–32.

25 For a comprehensive description of types of standards, see Robert A. Brady, *Industrial Standardization* (New York: National Industrial Conference Board, Inc., 1929), 23.

26 Andrew Russell, "Industrial Legislatures: The American System of Standardization," *Standards Engineering* 58, no. 5 (September 10, 2006); Andrew L. Russell, *Open Standards and the Digital Age: History, Ideology, and Networks*, Kindle ed. (New York: Cambridge University Press, 2014); JoAnne Yates and Craig N. Murphy, *Engineering Rules: Global Standard Setting since 1880* (Baltimore: Johns Hopkins University Press, 2019). They also underestimate the importance of the National Bureau of Standards, both in helping to set standards, as this book shows, and in prompting engineers to organize national standardizing bodies defensively. On the latter, see, for example, Rexmond C. Cochrane, *Measures for Progress: A History of the National Bureau of Standards*, Misc. Pub. No. 275 ([Washington, DC]: U.S. Department of Commerce, National Bureau of Standards, 1966), 255, 304.

27 Yates and Murphy, *Engineering Rules*, 34, 35.

28 Ellis W. Hawley, "Herbert Hoover, the Commerce Secretariat, and the Vision of an 'Associative State,' 1921–1928," *Journal of American History* 61, no. 1 (June 1974): 125; Peri E. Arnold, "The 'Great Engineer' as Administrator: Herbert Hoover and Modern Bureaucracy," *Review of Politics* 42, no. 3 (July 1980): 342–3; Ellis Hawley, "Three Facets of Hooverian Associationalism: Lumber, Aviation, and Movies, 1921–1930," in Thomas K. McCraw, ed., *Regulation in Perspective: Historical Essays* (Boston, MA: Division of Research, Graduate School of Business Administration, Harvard University; Cambridge, MA: Distributed by Harvard University Press, 1981), 101–4; Kendrick A. Clements, "Herbert Hoover and Conservation, 1921–1933," *American Historical Review* 89, no. 1 (February 1984): 70–3; William J. Barber, *From New Era to New Deal: Herbert Hoover, the Economists, and American Economic Policy, 1921–1933* (Cambridge and New York: Cambridge University Press, 1985), 13–14; David M. Hart,

"Herbert Hoover's Last Laugh: The Enduring Significance of the 'Associative State' in the United States," *Journal of Policy History* 10, no. 4 (1998): 423; Marc Allen Eisner, *From Warfare State to Welfare State: World War I, Compensatory State-Building, and the Limits of the Modern Order* (University Park: Pennsylvania State University Press, 2000), 119–21; Regina Lee Blaszczyk, "No Place Like Home: Herbert Hoover and the American Standard of Living," in Timothy Walch, ed., *Uncommon Americans: The Lives and Legacies of Herbert and Lou Henry Hoover* (Westport, CT, and London: Praeger, 2003), 125–6; Kendrick A. Clements, *The Life of Herbert Hoover: Imperfect Visionary, 1918–1928* (New York: Palgrave Macmillan, 2010), 110–11 (cited hereafter as *Imperfect Visionary*); Glen Jeansonne, with David Luhrssen, *Herbert Hoover: A Life* (New York: New American Library, 2016), 161. On historians' changing views of Hoover, see Brian E. Birdnow, "Hoover Biographies and Hoover Revisionism," in Katherine A. S. Sibley, ed., *A Companion to Warren G. Harding, Calvin Coolidge, and Herbert Hoover* (Chichester: John Wiley & Sons, 2014), 379–96.

29 William R. Tanner, "Secretary Hoover's War on Waste, 1921–1928," in Carl I. Krog and William R. Tanner, eds., *Herbert Hoover and the Republican Era* (Lanham, MD: University Press of America, 1984), 22.

30 Chandler, *The Visible Hand*, 209, 238; Freeman, *Behemoth*, xii.

31 Hounshell, *From the American System to Mass Production*, 260–1.

32 See Robert J. Gordon, *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War* (Princeton University Press, 2017), 557, who cites Moses Abramovitz and Paul A. David, "American Macroeconomic Growth in the Era of Knowledge-Based Progress: The Long-Run Perspective," in Stanley L. Engerman and Robert E. Gallman, eds., *Cambridge Economic History of the United States*, vol. III: *The Twentieth Century* (Cambridge, UK, and New York: Cambridge University

Press, 2000), 48, who in turn cite Hounshell. See also: Freeman, *Behemoth*, 144 (citing Hounshell). In an earlier, influential study, economic historian Nathan Rosenberg also portrayed the diffusion of Ford's techniques in the 1920s implicitly as a learning process: Nathan Rosenberg, *Technology and American Economic Growth* (Armonk, NY: Sharpe, 1972), 112–13. See, more recently, David Mowery and Nathan Rosenberg, "Twentieth-Century Technological Change," in Engerman and Gallman, eds., *Cambridge Economic History of the United States*, vol. III, 834–35. See also Jonathan Levy, *Ages of American Capitalism: A History of the United States*, Kindle ed. (New York: Random House, 2021), 326.

33 David E. Nye, *America's Assembly Line* (Cambridge, MA: MIT Press, 2013), 53.

34 M. D. Cooper, "Simplification in the Lamp Industry," *Electrical World* 82, no. 12 (1923): 630. Cooper was in the Engineering Department of General Electric's National Lamp Works.

35 Arthur A. Bright, Jr., *The Electric-Lamp Industry: Technological Change and Economic Development from 1800 to 1947* (New York: Macmillan Company, 1949), 202–3.

36 U.S. Department of Commerce and Labor, Bureau of Standards, *Standard Specifications for the Purchase of Carbon-Filament Incandescent Lamps, Bureau Circular No. 13* (Washington, DC: Bureau of Standards, May 1, 1907), 3, available at https://hdl.handle.net/2027/uiug.30112106920736; U.S. Department of Commerce, Bureau of Standards, *Standards Yearbook 1927*, Misc. Pub. No. 77 (Washington, DC: Government Printing Office, 1927), 3; Cochrane, *Measures for Progress*, 112. The specifications were periodically revised in formal or informal conferences and then were adopted by the new Federal Specifications Board in 1922: Cochrane, *Measures for Progress*, 112n118; U.S. Department of Commerce, *United States Government Specifications for Large Tungsten Filament Incandescent Electric Lamps, Circular of the Bureau of Standards, No. 13 [10th Edition Issued February 7, 1923]: Federal Specifications Board, Standard Specification*

No. 23 ([Washington, DC]: [Government Printing Office], 1923), 1, available at https://hdl.handle.net/2027/uiug.30112106920728.

37 U.S. Department of Commerce, *Standards Yearbook 1927*, 3.

38 Ray M. Hudson, "The New Conservation – II," *Scientific American* 128, no. 1 (January 1923): 28 (editor's note in text box).

39 On economic actors and strategic reflection, see Sabel and Zeitlin, "Stories, Strategies, Structures," 1–33.

40 Cecil Chisholm, "Simplification in British Industry: I. – Progress at Home and Abroad," *The Times Imperial and Foreign Trade and Engineering Supplement* (London), August 8, 1925, 513; U.S. Department of Commerce, Division of Simplified Practice, "Supplement: British Interest in Simplified Practice," *Monthly News Bulletin*, no. 8 (November 15, 1925): 3.

41 On varieties of capitalism, the foundational study is Peter A. Hall and David W. Soskice, eds., *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage* (New York: Oxford University Press, 2001), which has spawned an enormous literature. Among many possible points of entry, see Colleen A. Dunlavy and Thomas Welskopp, "Myths and Peculiarities: Comparing U.S. and German Capitalism," *German Historical Institute Bulletin*, no. 41 (Fall 2007): 33–64; Bob Hancké, ed., *Debating Varieties of Capitalism: A Reader* (Oxford University Press, 2009); "'Varieties of Capitalism' Roundtable," *Business History Review* 84, no. 4 (Winter 2010). On Fordism, see Stefan Link, *Forging Global Fordism: Nazi Germany, Soviet Russia, and the Contest over the Industrial Order*, Kindle ed. (Princeton and Oxford: Princeton University Press, 2020), esp. the section "What Was Fordism?" in the Introduction.

2 "A Profusion of Styles" on the Eve of the Great War

1 The "product diversity" described here is different from product "diversification." Following Chandler, the strategy of diversification, increasingly popular in the 1920s, entailed adding new product lines that were technologically related to existing product lines or could be handled by the existing sales organization.

"Notices, Department of Commerce, National Bureau of Standards, Voluntary Product Standards: Action on Proposed Withdrawal," *Federal Register* 39, no. 109 (June 5, 1974): 19972 (citing a trade association's standards as equivalent and up to date); "Notices, Department of Commerce, National Bureau of Standards, Simplified Practice Recommendation, Notice of Intent to Withdraw," *Federal Register* 43, no. 248 (December 26, 1978): 60182 (citing an up-to-date federal specification).

149 Congressional Research Service, *Voluntary Industrial Standards*, 1, 4. On the National Bureau of Standards' new responsibilities in the 1970s and early 1980s, see Schooley, *Responding to National Needs*, 469–71. On the new social regulation, see David Vogel, "The 'New' Social Regulation in Historical and Comparative Perspective," in McCraw, ed., *Regulation in Perspective*, 155–85.

150 Hemenway, *Industrywide Voluntary Product Standards*, 89–90; Passaglia, *A Unique Institution*, 687.

151 "Voluntary Product Standards Program," NIST Standards.gov. See also American Lumber Standard Committee, Inc., *History* (http://alsc.org/geninfo_history_mod.htm).

152 Economic Cooperation Administration, *Increasing Productivity*, 11.

Afterword

1 See Geoffrey M. Hodgson, *Conceptualizing Capitalism: Institutions, Evolution, Future* (Chicago and London: University of Chicago Press, 2015); Simon Deakin et al., "Legal Institutionalism: Capitalism and the Constitutive Role of Law," *Journal of Comparative Economics* 45 (2017): 188–200.

2 Historical research suggests that regulation and promotion are interdependent – the government that promotes business is better positioned to regulate it; the government that regulates without the quid pro quo of promotion encounters resistance: Colleen A. Dunlavy, "Mirror Images: Political Structure and Early Railroad Policy in the United States and Prussia," *Studies in American*

Political Development 5 (Spring 1991): 1–35. On the distinctive division of policymaking powers between the federal and state governments in the U.S., which weakened the ability of both to regulate business, see David Brian Robertson, *Capital, Labor, and State: The Battle for American Labor Markets from the Civil War to the New Deal* (Lanham, MD: Rowman & Littlefield Publishers, 2000). For a useful conceptual framework for capturing the scope of "industrial policy," see Réka Juhász and Claudia Steinwender, "Industrial Policy and the Great Divergence," National Bureau of Economic Research, Working Paper 31736, Cambridge, MA, September 2023, www.nber.org/papers/w31736.

3 *The Public Statutes at Large of the United States of America, From the Organization of the Government in 1789, to March 3, 1845 . . .* (Boston: Charles C. Little and James Brown, 1845), 24–8 (chs. II and III).

4 For an introduction, see Harry N. Scheiber, "Federalism and the American Economic Order, 1789–1910," *Law and Society Review* 10, no. 1 (Fall 1975); William R. Brock, *Investigation and Responsibility: Public Responsibility in the United States, 1865–1900* (Cambridge University Press, 1984); Merritt Roe Smith, ed., *Military Enterprise and Technological Change: Perspectives on the American Experience* (Cambridge, MA: MIT Press, 1985); William J. Novak, *The People's Welfare: Law and Regulation in Nineteenth-Century America* (Chapel Hill and London: University of North Carolina Press, 1996); Heather Cox Richardson, *The Greatest Nation of the Earth: Republican Economic Policies during the Civil War* (Cambridge, MA: Harvard University Press, 1997); Robertson, *Capital, Labor, and State*; David A. Moss, *When All Else Fails: Government as the Ultimate Risk Manager* (Cambridge, MA: Harvard University Press, 2002); Jason Scott Smith, *Building New Deal Liberalism: The Political Economy of Public Works, 1933–1956* (New York: Cambridge University Press, 2006); Brian Balogh, *A Government out of Sight: The Mystery of National Authority in Nineteenth-Century America* (Cambridge University Press, 2009); Jacob S. Hacker and Paul Pierson, *American*

Amnesia: How the War on Government Led Us to Forget What Made America Prosper (New York: Simon and Schuster, 2016); and Lindsay Schakenbach Regele, *Manufacturing Advantage: War, the State, and the Origins of American Industry, 1776–1848* (Baltimore: Johns Hopkins University Press, 2019). The political history of the idea of free enterprise is explored in Lawrence B. Glickman, *Free Enterprise: An American History* (New Haven: Yale University Press, 2019).

5 On industrial policy from the 1980s through the turn of the twenty-first century, see Fred Block, "Swimming against the Current: The Rise of a Hidden Developmental State in the United States," *Politics and Society* 36, no. 2 (2008); Andrew Schrank and Josh Whitford, "Industrial Policy in the United States: A Neo-Polanyian Interpretation," *Politics and Society* 37, no. 4 (2009). Thanks to Pierre-Christian Fink for pointing me toward this literature.

6 E. J. Dionne, Jr., "Biden, Macron and the End of the Reagan–Thatcher Era," Opinion, *Washington Post*, December 4, 2022, www.washingtonpost.com/opinions/2022/12/04/biden-macron-end-reagan-thatcher-era.

7 Smith, *Harpers Ferry Armory*; Merritt Roe Smith, "Army Ordnance and the 'American system' of Manufacturing, 1815–1861," in Smith, ed., *Military Enterprise and Technological Change*, 39–86; Schakenbach Regele, *Manufacturing Advantage*.

8 Hartmut Berghoff, *Moderne Unternehmensgeschichte: Eine Themen- und Theorieorientierte Einführung*, 2nd ed. (Berlin, Munich, Boston: Walter de Gruyter GmbH, 2016), 313.