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Industrial Policy in the United States: A Neo-Polanyian Interpretation

Andrew Schrank[1] and Josh Whitford[2]

Abstract

The conventional wisdom holds that U.S. political institutions are inhospitable to industrial policy. The authors call the conventional wisdom into question by making four claims: (1) the activities targeted by industrial policy are increasingly governed by decentralized production networks rather than markets or hierarchies, (2) "network failures" are therefore no less threatening to industrial dynamism than market or organizational failures, (3) the spatial and organizational decentralization of production have simultaneously increased the demand and broadened the support for American industrial policy, and (4) political decentralization is therefore likely to improve the functioning of industrial policies designed to combat network failures.

Keywords

industrial policy, networks, federalism, Polanyi, governance

A substantial body of literature addresses the alleged merits and putative preconditions of industrial policies designed to foster adjustment and economic growth. Industrial policies that ostensibly combat market failures in centralized polities are purportedly ill at ease in their decentralized counterparts, and no less "sympathetic" an observer than sociologist Frank Dobbin therefore finds it hard to believe that an American "industrial policy would meet with success, as in Japan, rather than with disaster, as in Britain."[1] Nor is Dobbin alone. "Political sociology's conventional wisdom suggests that American state structure is better suited to inchoate, misguided bailouts characterized by political graft than to coherent, disinterested, planning on the Japanese model."[2]

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This article calls the conventional wisdom into question, however, by making four key points about the relationship between economic needs and political possibilities in the contemporary United States: first, that the activities most likely to be targeted by industrial policy are increasingly governed by decentralized production networks rather than competitive markets or vertically integrated corporations; second, that "network failures" are therefore no less threatening to industrial dynamism than "market failures" or "organizational failures"; third, that the spatial and organizational decentralization of production have simultaneously *increased* the demand and *broadened* the support for industrial policy in the United States; and fourth, that political decentralization is likely to improve, rather than inhibit, the functioning of industrial policies designed to combat network failure in the U.S. context.[3] We therefore conclude that the development of a *theory* of network failure capable of guiding intervention into the network economy is an urgent task not only for economic sociology but for progressive politics as well.

Our argument draws explicitly on a "neo-Polanyian" approach to political economy in that it simultaneously *rejects* the idea "that the economy is autonomous and obeys a single logic" and *recognizes* the ebb and flow of laissez-faire and social protection—that is, the pendular swing at the heart of Polanyi's *Great Transformation*—as the principal source of dynamism in capitalist society.[4] Part I sets the proverbial stage by placing the neo-Polanyian interpretation against the backdrop of three earlier approaches to industrial policymaking—orthodox market fundamentalism, liberal market skepticism, and neo-institutionalism—that gave analytical pride of place to path dependence and market failure.[5] Our goal in so doing is less to fight a three-front war than to trace the evolution of the "industrial policy debate" over time.[6] Part II portrays contemporary American industrial policies not as path-dependent legacies of decentralized political institutions but as open-ended responses to the decentralization of economic activity and in so doing identifies *network failures* as their unacknowledged—and heretofore unnamed—targets. Network failures arise where the social and political requisites of productive decentralization fail to obtain, and actors who would otherwise reap the rewards of reciprocity are tempted—if not necessarily compelled—to abandon "network forms of organization" for suboptimal markets or hierarchies.[7] Part III holds that network failures are best addressed not by abandoning network forms of organization but by pursuing industrial policies that are simultaneously designed to ensure their success and at home in the U.S. political context. While federalism and the separation of powers are admittedly incompatible with the development of an "integrated economic strategy" like the one adopted by postwar Japan, they all but guarantee experimentation, diversity, and the exploitation of local knowledge and in so doing allow decentralized production networks to flourish.[8] And Part IV concludes by calling for the development of a theory of network failure designed not only to advance the intellectual project of the new economic sociology but to contribute to a progressive policy agenda by facilitating policy responses to the malfunctioning of the network economy. Existing theories of market and organizational failure dominate the contemporary policy discussion in part because they serve to diagnose problems and

direct public and private officials toward meaningful solutions. A viable theory of network failure will have similar practical payoffs and will simultaneously place the new economic sociology on a sounder theoretical footing.

I. Intellectual Context

Fred Block provides our analytical point of departure by developing a "neo-Polanyian" perspective on comparative capitalism. Block holds that modern market economies are not only "embedded in legal, cultural, and political frameworks," à la Polanyi, but are simultaneously inoculated against systemic crisis by a variety of buffers and control mechanisms.[9] "A catastrophic failure that spreads from one part of the economy to others is still possible," he writes, "but such events are unlikely and unusual. The more typical pattern is that economic and political actors find ways to keep strains and difficulties in one part of the economic mechanism from having a dramatic impact elsewhere."[10]

The buffers and control mechanisms in question include taxes, regulations, subsidies, and public (or quasi-public) goods. They are simultaneously sources and symptoms of the so-called double movement between laissez-faire and social protection described by Polanyi. And their constant invention and reinvention ensure that market societies and institutions are not only less homogeneous but less path-dependent than existing theories allow.[11] The neo-Polanyian position can therefore be defined in terms of its commitment to three broad analytical principles: the "always embedded" nature of economic activity, the multiplicity of "ways to make a capitalist economy work," and the double movement of privatization and protection that brings the system to life.[12]

The debate over the likelihood and desirability of an American industrial policy provides a particularly useful test of the neo-Polanyian strategy, for industrial policies are classic examples of capitalist control mechanisms, and the leading approaches to their study tend to deviate from at least one of the aforementioned principles.[13] In fact, the best-known argument against industrial policy—and the principal target of Block's 2008 critique—is a market fundamentalist position that rejects all three neo-Polanyian commitments.[14] Market fundamentalists portray the market as a natural and self-regulating institution, the competitive process as an unforgiving source of productive optimization, and the "protective countermovements" anticipated by Polanyi as short-sighted threats to growth and efficiency.[15] While market fundamentalists accept the *reality* of market failure and the *possibility* of corrective action in theory, they hold that government failure is more common and militates against corrective action in practice. The market fundamentalist approach to industrial policy is therefore best encapsulated by Gary Becker's confident assertion that "the best industrial policy is none at all."[16]

The first round of the industrial policy debate pitted market fundamentalists like Becker against market skeptics like Robert Reich, Barry Bluestone, and Bennett Harrison more than a quarter of a century ago.[17] Market skeptics recognize that "government creates the market," and thereby embrace the embeddedness assumption, but simultaneously doubt that "there are multiple strategies for maintaining or improving a

nation's relative position," and thereby position themselves as the mirror image of their fundamentalist rivals.[18] While the market fundamentalists worry that industrial policy is more likely to seduce than to produce, and therefore disdain the "costly" appeals of so-called special interests, their critics fear that government intervention is an economic imperative and a political pipedream, and therefore insist that the U.S. is "losing time" in the face of an uncompromising competitive threat.[19] Thus, Ira Magaziner and Robert Reich conclude their classic call to arms, *Minding America's Business*, by simultaneously *acknowledging* the myriad obstacles to the formation of "a coherent industrial policy in a non-parliamentary system in which power is divided between Congress and the President, and shared with an array of commissions, agencies, boards, and administrations," and *warning* that in the absence of "careful coordination of public and private sectors," U.S. living standards would continue to erode.[20]

By the 1990s, however, the market skeptical critique of market fundamentalism had been superseded by a neo-institutional alternative that questioned not only the *viability* but the *importance* of industrial policy in the U.S. political context. While the neo-institutionalists accept the embeddedness and "multiple logics" of capitalist competition, they simultaneously abandon the double movement for notions of path dependence and positive feedback that posit *neither* (1) the adoption of "coordination-oriented" policies that address "firm needs with relative precision" nor (2) the erosion of American living standards in the face of foreign competition but (3) the reinforcement of "market-incentive policies" like antitrust enforcement, macroeconomic stabilization, and public goods provision that "induce actors to perform more effectively."[21] The neo-institutional perspective on the U.S. economy is therefore epitomized by Michael Mann's assertion that "there is no serious American industrial policy; this is left to the post-war powerhouses of the US economy, the large corporations. Much of this is due to the radical separation of powers enshrined by the US constitution. A coordinated political economy cannot easily be run by a President and his cabinet, two Houses of Congress, a Supreme Court and fifty 'states' (which are also fragmented by the same separation of powers)—especially when they belong to different political parties."[22]

Round 2 of the industrial policy debate therefore promises to pit neo-institutionalists who foresee "continuities in different national trajectories" against neo-Polanyians like Block who hope to revive the study of "discontinuity and institutional reconfiguration."[23] After all, the neo-Polanyians embrace embeddedness, multiple logics of capital, and the double movement and in so doing rebel against path dependence in general, and the neo-institutional analysis of American capitalism in particular, by noting not only that "the typical U.S. firm is highly dependent on state action" but that the broader U.S. "model of capitalism is built around a core of highly protected and state-dependent industries that are very far removed from any hint of economic liberalism."[24] They reap the rewards of implicit and explicit subsidies that tend to grow as job losses (and fear of job losses) in traditional industries mount.[25] And they are therefore the ironic beneficiaries of the protective double movement.

Table 1 summarizes the key features of the four perspectives on U.S. industrial policy. Market fundamentalists reject the neo-Polanyian assumptions outright. Market

Table 1. Perspectives on Industrial Policy in the Contemporary United States

Perspective/assumption	Embeddedness	Multiple logics	Double movement
Market fundamentalist	No	No	No
Market skepticism	Yes	No	No
Neo-institutional	Yes	Yes	No
Neo-Polanyian	Yes	Yes	Yes

Table 2. Implications of Political-Economic Theories of Industrial Policy

Likelihood of industrial policy	Importance of industrial policy	
	Lower	Higher
Lower	Neo-institutionalists: U.S. policy makers will continue to make markets; U.S. economy can continue to prosper	Market skeptics: U.S. policy makers will prove unable to adopt an industrial policy; U.S. economy will decline.
Higher	Market fundamentalists: U.S. policy makers will adopt an industrial policy; U.S. economy will suffer	Neo-Polanyians: U.S. policy makers will adopt an industrial policy; U.S. economy can reap the rewards.

skeptics embrace embeddedness but reject multiple logics of capitalist competition and the double movement of privatization and protection. Neo-institutionalists embrace embeddedness and multiple logics but reject the double movement. And neo-Polanyians embrace the three commitments *en bloc*.

Which interpretation is more accurate? While the competing frameworks do not lend themselves to a simple empirical test, they do offer distinct observable implications. For example, market fundamentalists fear that industrial policy is likely to prove "inevitable and ineffective" in the United States.[26] Market skeptics worry not only that the "fragmented structure" of the U.S. political system will discourage the growth of "an ideological consensus on industrial policy" but that Congress will inhibit the growth "of independent bureaucratic-industry channels like those MITI has been able to construct" in Japan.[27] Neo-institutionalists posit the reproduction of "market-incentive policies that do not put extensive demands on firms to form relational contracts" with each other including regional development plans, support for basic research, and the formal provision of portable skills.[28] And neo-Polanyians believe that the U.S. government has "become ever more immersed in its own business economy through its technology policies" and will in all likelihood grow even more so in the years to come.[29] Table 2 describes the four theories and their observable implications.

Nevertheless, the evidence adduced by Block would appear to put paid to the alternative accounts. On one hand, the United States has adopted an increasingly forward

industrial policy rooted in a number of different agencies and organizations. For example, the National Institutes of Health and the Advanced Research Projects Agency (ARPA) not only fund research and development—and run interference on their behalf—but simultaneously broker relationships between scientists, engineers, and entrepreneurs that foster the growth of new firms and industries. Nor are they alone. Federal laboratories simultaneously pursue basic and applied research, collaborate with private investors, and encourage their own scientists to bring their innovations to market with the help of a variety of subsidies and incentive programs. The National Institute of Standards and Technology (NIST) facilitates the growth of existing firms through a number of different matching grants and Manufacturing Extension Partnerships (MEPs) that are "organized to be responsive to the particular technical needs of an area's manufacturing sector."[30] And the Small Business Administration (SBA) fosters the growth of innovative activity with the support of set-aside programs like Small Business Innovation Research (SBIR) grants.[31] "Below the ideological surface," write Henry Etzkowitz and his colleagues, "a powerful 'jerry-built' substrate has emerged of federal, state, and local government innovation support programs each filling gaps in the other."[32]

On the other hand, U.S. industrial policy is broadly successful. While the aforementioned efforts are designed to foster externalities that are by their very nature intangible, and are therefore difficult to evaluate by means of traditional cost-benefit analysis, they appear to have passed at least two important tests in that they are associated with the development of valuable products and processes and are not readily captured by their beneficiaries.[33] For instance, the SBA and NIST impose performance standards on program participants.[34] The SBIR awards in particular are distributed in a sequential manner in an effort "to manage risk."[35] And ARPA program managers are told to withdraw funding from underperforming projects in favor of more promising alternatives.[36]

Finally, American industrial policy is growing more assertive and visible by the day, for the federal government already owns a controlling stake in the country's largest banks.[37] Washington is pouring billions of dollars worth of stimulus money into energy, medical, and information technologies. And the Obama administration's automotive rescue package promises not only to give the taxpayers a dominant stake in General Motors but to place Washington "squarely in the position of adopting a so-called industrial policy, in which government officials, not business executives or the free market, decided what kinds of products a company would make and how it would chart its future."[38]

While Block underscores the political importance of job creation, and thereby reveals the rationale for industrial policy making, he all but overlooks political institutions and in so doing leaves the "currently dominant" neo-institutional approach bloodied but unbowed.[39] After all, the neo-institutionalists portray the U.S. constitutional structure as uniquely ill suited to industrial policy making, and political scientists Ellis Krauss and Jon Pierre therefore go so far as to assert that parliamentary institutions constitute a "necessary, if not sufficient, condition" of serious industrial policy.[40] How did U.S. policy makers overcome the constraints imposed by their political institutions? Do their efforts gainsay the neo-institutionalist critique? And if so, how? We

address these questions by treating the decentralization of production—itself a partial product of the Polanyian double movement—as a key intervening variable in the next two sections: first, a response to those who doubt the *political viability* of industrial policy in the U.S. context; and second, a rejoinder to those who doubt the *economic rationality* of industrial policy in the U.S. context.

II. Productive Decentralization and Decentralized Production

Over the course of the past three decades, the United States has been transformed from the virtual archetype of a "liberal market economy" into an increasingly enthusiastic practitioner of industrial policy.[41] While the Obama administration's ongoing efforts to revive lending, defend the auto industry, and jump-start innovative activities are by now well known, and have thereby placed the issue of industrial policy at the center of the political debate, they are by no means unprecedented. On the contrary, the federal government has been pursuing industrial policy within decentralized political institutions for well over a generation.[42]

The aforementioned concerns about conflicts between the Frostbelt and the Sunbelt, the states and the federal government, and the White House and the courts—not to mention the broader fear of government bureaucrats "working at cross-purposes" from each other—would therefore appear to be misguided.[43] After all, U.S. political institutions are a constant, and the growth of industrial policy is a variable. The former cannot convincingly explain the latter. And a superior approach would therefore recognize the myriad ways in which the decentralization of production mediates the relationship between the decentralized nature of the U.S. polity and the activities of American industrial policy makers.

Industrial Policy in the Network Economy

By decentralization of production, we mean the decline—if by no means disappearance—of vertically integrated production complexes and the corresponding growth of smaller-scale suppliers, subcontractors, and middlemen linked by interorganizational networks at home and abroad.[44] Production is thereby decentralized in both organizational and geographic terms for a variety of reasons and with variable consequences. While the postwar boom rendered large firms in core regions and sectors vulnerable to holdup by trade unions and regulation by the state, and thereby encouraged their quest for an exit strategy, the decline of traditional agriculture threatened to despoil and depopulate peripheral regions and thereby animated peripheral efforts to woo industrial transplants with tax breaks and regulatory rollbacks.[45] Federal officials played an indispensable part in the process, however, for they not only brokered relationships between foreign policy makers and transplants in an effort to pacify potential trouble spots overseas but simultaneously channeled military spending toward the domestic periphery in an effort to combat underdevelopment at home.[46]

The results have been nothing short of spectacular. Publicly employed or allied scientists and engineers moved to the Sunbelt in large numbers; manufacturing activity followed in due course; and the South and Southwest thereby began to compete for investors and jobs—and in so doing broadened the coalition for U.S. industrial policy.[47]

New Mexico provides a particularly apposite illustration. On the one hand, the Land of Enchantment is a classic extractive economy and one of the poorest states in the union. Oil, gas, and agricultural interests have traditionally dominated the state legislature and inhibited essential investments in physical and human capital. On the other hand, New Mexico plays host to two federal laboratories, numerous military research installations, more PhD-holding scientists and engineers per worker than any other state in the union, and a growing number of innovative start-ups. Consequently, the state's congressional delegation and governor have become ardent and influential defenders of federal science and technology policies.[48]

Nor is New Mexico unique. The decentralization of production has tempered—if by no means eliminated—southern opposition to broader government intervention. Take, for example, the automobile industry. While congressional auto politics have traditionally pit foreign transplants and their supporters in the "right-to-work" South against domestically owned firms and their stakeholders in the Midwest, and have thereby assumed a regional as well as partisan cast, they are by no means monolithic.[49] For instance, Tennessee Senator Bob Corker has abandoned his earlier misgivings and come out in favor of an auto rescue package that his fellow Republicans deride as "industrial policy."[50]

The point is certainly not to portray Corker as a principled *advocate* of industrial policy. On the contrary, he disdains efforts to set standards, decries efforts to pick winners, and worries that by ignoring private prerogatives "we've lost our moral high ground throughout the global community as it relates to chastising other countries that use strong arm tactics to invade on private property rights."[51]

Unlike his partisan allies, however, Corker agreed to work with Senate Democrats and stakeholders in Detroit to rescue the domestic auto industry. What is behind his volte-face? Tennessee not only boasts two Japanese auto transplants and a billion-dollar Volkswagen investment but simultaneously plays host to a vulnerable General Motors facility and parts suppliers who *serve* and *depend upon* the so-called Detroit Three as well as foreign clients, and Corker therefore worries that the "supplier shock" engendered by the collapse of the domestic auto industry would endanger the entire regional supply chain.[52]

In fact, the organizational decentralization of production is neither identical to the spatial decentralization of production nor secondary in importance. Organizations that share key suppliers or customers develop a mutual interest in their survival and thus tend to support public policies that ensure their prosperity regardless of their individual locations.

The SBIR program provides a particularly powerful example. SBIR stipulates that federal agencies with large research budgets (e.g., the Department of Energy, the National Institutes of Health, etc.) allocate 2.5 percent of their research and development (R&D)

funds to small businesses by means of competitive awards. While major research universities feared the diversion of funds when the legislation was introduced in the early 1980s, and therefore lobbied against the program, they found that award recipients rented their facilities and collaborated with their faculty when the program took effect, and therefore reversed course and embraced SBIR a few years later.[53]

What are the long-term consequences? SBIR distributes approximately five thousand awards to fifteen hundred firms per year and plays an indispensable part in the country's "de facto industrial policy."[54] The National Research Council maintains that more than two-thirds of all recipients have a former academic among their founders, that approximately one-third of their projects employ university resources and personnel, and that their efforts to turn knowledge into profit help bridge the traditional gap between the university and the marketplace.[55] The Association of American Universities (AAU) has therefore become a leading defender of the program.[56]

Nor is the AAU alone. SBIR alumni like Qualcomm and AmGen give the program credit for their success.[57] Independent analysts offer broadly similar assessments.[58] And small business therefore plays an active part in the program's defense in Washington.[59]

Other programs in the U.S. industrial policy-making apparatus have their own—sometimes overlapping—constituencies with similar implications. For instance, General Electric and Cray extol the virtues of collaboration with the federal laboratories.[60] The pharmaceutical and biotechnology industries lobby for increased National Institutes of Health (NIH) funding.[61] And not only small businesspeople but their Fortune 500 clients testify in Congress on behalf of NIST efforts like the Advanced Technology Program (ATP) and MEP.[62]

In other words, the decentralization of production fosters not only greater dependence on government programs but *greater interdependence* among their beneficiaries and thereby contributes to the growth of a community of interest in their defense. Deborah Grubbe of Dupont underscored the new reality when she discussed a collaborative effort to ensure the quality and efficiency of production among independent Corian countertop fabricators who "may not have resources to train their employees" in hearings on the MEP in 2004.

> We invited MEP representatives to present business cases for change at several national fabricator conferences. MEP personnel developed a consistent scope of work, methodology, and project tracking capability for hundreds of the Corian fabricators. Currently, MEP has seven active programs with fabricators around the country. Dupont has agreed to contact 300 more to support MEP. In a growing business like Corian, this supports job growth and creation in many communities.[63]

Grubbe went on to join forces with representatives of dozens of other corporations (e.g., Corning, Hewlett Packard), universities (e.g., Purdue), and trade associations (e.g., the Business Software Alliance) in the "Coalition for NIST Funding" and to testify on behalf of the ATP as well—and her testimony therefore underscores the ways in which industrial policies tend to build coalitions in their own defense.[64]

Our point is less to argue that the aforementioned policies and coalitions are invincible—for example, the Bush administration overrode the objections of the Coalition for NIST Funding and abolished the ATP in 2007—than to recognize that they are no longer inconceivable. After all, the spatial and organizational decentralization of production have broadened industrial policy's support base to include not only Fortune 500 firms but their tens of thousands of clients, suppliers, and stakeholders—and in so doing have at least partially overcome the "tyranny of locality" engendered by federalism and the separation of powers without opening the door to the many risks anticipated by industrial policy's critics.[65]

In fact, the ATP's elimination provides an important opportunity not only to reflect upon the exaggerated risk that industrial policies will be captured by their beneficiaries but to simultaneously observe the centrality of program design and organizational learning to program survival.[66] After all, James Turner of the House Committee on Science had already traced the differential vulnerability of the MEP and the ATP to the former program's "strong base in each of the 50 states" and the latter program's inability "to aid companies in a larger number of congressional districts" in the early-twenty-first century, and NIST appears to have learned from the experience.[67] The ATP's "successor program" therefore *encourages* university-industry partnerships and *forbids* the direct funding of large firms in a self-conscious effort to broaden the program's base and dispel accusations of policy capture and "corporate welfare."[68]

A skeptic might reasonably ask whether a vast array of policies administered by a host of different agencies at multiple levels of government are collectively worthy of the title "industrial policy." After all, Magaziner and Reich did not so much deny the existence of U.S. industrial policy in the 1980s as worry that it was "irrational," "uncoordinated," and therefore doomed to fail. "It is an industrial policy by default," they argued, "in which government and business are intertwined but in which the goal of international competitiveness has not figured."[69]

Is the contemporary U.S. approach equally incoherent? Our negative answer rests on two considerations: first, the fact that the industrial policies in vogue today are designed to combat network—rather than market or organizational—failures; and second, a distinction between a loosely coupled system and one that is entirely devoid of coordination.

The Nature of Network Failure

The original industrial policy debate took place in an era of centralized production in which large firms internalized as much of their activity as possible, met the rest of their needs at arm's length in competitive markets, and expected the government to address market failures when they occurred without generating organizational (or government) failure in doing so. Participants in the debate therefore parted company over the relative likelihood and severity of market and government failure: market fundamentalists downplayed the probability and cost of market failure and bemoaned the risk of government failure, and market skeptics took the opposite position.

Over the course of the past two decades, however, network forms of organization have not only been portrayed as alternatives to markets and hierarchies but have proven particularly central to the innovation-based industries the U.S. government is targeting.[70] Examples of network-governed activities would include—but by no means be limited to—collaborative R&D among high-technology enterprises in Boston and the San Francisco Bay Area, joint ventures and strategic alliances in the aerospace industry, and the decentralized production of durable consumer goods in the Upper Midwest.[71]

Our point is most certainly not to imply the universal superiority of network forms of organization. Many transactions are ill suited to network governance and are best left to markets or hierarchies.[72] But networks "place a premium on adaptability" and are therefore particularly well suited to "fast-paced fields where knowledge is developing rapidly, the sources of expertise are widely dispersed, and there is uncertainty about the best approach to a problem."[73]

Network forms of organization are difficult to forge and hard to sustain, however, and the existing literature is therefore replete with evidence of what we label "network failure."[74] For example, Bruce Kogut estimates that more than two-thirds of manufacturing joint ventures are terminated within a decade of their formation.[75] The Boston Consulting Group concludes that well over half of the strategic alliances forged in the airline industry are outright failures.[76] And Sherrie Human and Keith Provan admit that more than 60 percent of the small firm networks they studied in the mid-1990s had evaporated by 1998.[77]

Nor is network failure limited to the dissolution or collapse of already existing relationships. Some networks are stillborn and thereby constitute the relational analog to the "missing markets" that have permeated and bedeviled mainstream economic theory for decades.[78] Other networks "persist yet perform poorly" and thereby come to resemble the "permanently failing organizations" that are by now familiar features of the sociological landscape.[79]

Round 2 of the industrial policy debate is therefore unavoidably concerned with network failure. While neo-institutionalists like Peter Hall and David Soskice believe that "non-market coordination" is *bound* to fail in liberal market economies, and therefore warn U.S. policy makers "to avoid agencies interventionist enough to interfere with the operation of market mechanisms," their neo-Polanyian critics view network failure as a treatable illness, and therefore sing the praises of little-known government efforts to build and reinforce collaborative relationships.[80] After all, the ATP's legislative mandate included the promotion "of collaborative R&D relationships among companies, universities, and other research organizations."[81] ARPA and the federal laboratories build and exploit networks of academic and private sector investigators as a matter of course.[82] And SBIR recipients are all but inundated with networking opportunities as they make their way through the program.[83]

The Logic of Loose Coupling

Our analysis of the prospects for U.S. industrial policy presupposes not only a distinction between centralized production processes and their decentralized successors but

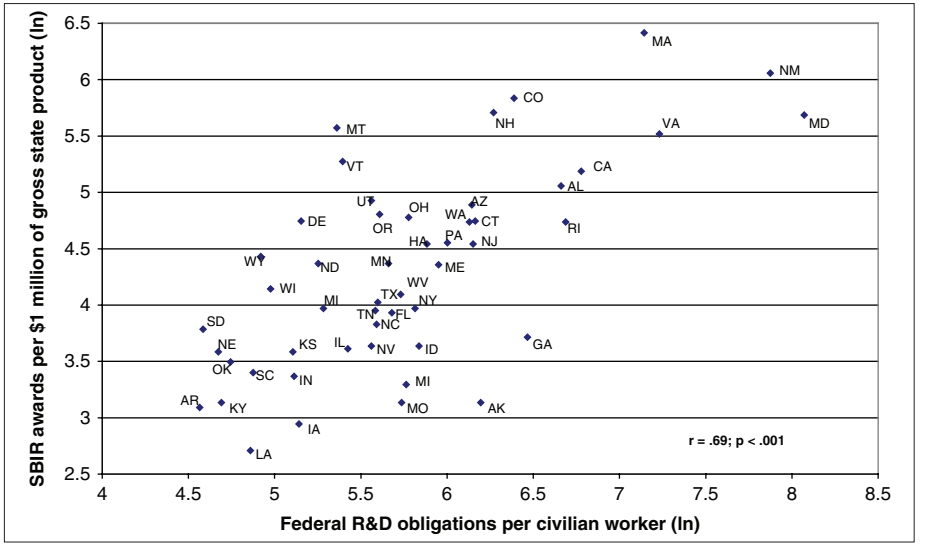

Figure 1. Small Business Innovation Research (SBIR) awards and federal research and development (R&D) funding (c. 2000).
Data: National Science Board (2008) and Science and Engineering Indicators (2008). Arlington, VA: National Science Foundation. Table 8-31 (p. 8-71) and Table 8-44 (p. 8-95).

a no less important distinction between "direct" administrative control over subordinate actors, "indirect" or "ecological" control over the premises of their decisions (i.e., goals, values, information, etc.), and an outright lack of control.[84] The existing literature implies a discrete choice between direct control (i.e., top-down planning) and a complete lack of control (i.e., laissez-faire) that perhaps made sense in an era of "markets *or* hierarchies" but is decidedly anachronistic today. While direct control is inconsistent with the autonomy of the myriad agencies involved in industrial policy making, a lack of control is able to account for neither the consistency nor the complementarity of their outputs.[85] For example, the federal laboratories are a key source of SBIR award winners.[86] SBIR winners frequently take advantage of the MEP during the commercialization phase of their projects.[87] And SBIR and ATP have frequently been portrayed as complementary as well.[88] We hope to underscore the complementary nature of the different programs by plotting an indicator of SBIR award funding against an indicator of overall federal R&D spending—which purportedly captures the presence "of major federally funded research facilities" like laboratories or research institutes—for all fifty states in Figure 1.[89]

The data are consistent not only with the notion of policy synergies but with the National Science Board's assertion that SBIR awards accrue "to locations of federal laboratories or well-recognized academic research institutions from which innovative small businesses have emerged."[90] After all, California, Colorado, and New Mexico boast national laboratories; Alabama's SBIR awards tend to be linked to the Marshall

Space Flight Center; Maryland and Virginia play host to the NIH and NSF; and Massachusetts is home to a dense population of universities including Harvard and MIT.[91]

A more accurate approach would therefore acknowledge the middle ground of a loosely coupled industrial policy administered by means of ecological control. Charles Wessner of the National Research Council put the distinction between a loosely coupled and an uncoupled (or incoherent) system in colloquial terms in his testimony before the Senate Committee on Homeland Security and Governmental Affairs in 2005 by stressing

> that this is not an either/or. We need the basic research. We need the applied research that often comes out of the military. We need other program like SBIR that are designed to encourage this. And we need ATP. Asking which one is more important is like asking which rung in the ladder do you think you need. You need all the rungs on the ladder. That is how you get there. You may be able to skip one, but it becomes very hard to skip two.[92]

Wessner's testimony speaks not only to the design of American industrial policies but to the attitudes of their designers—and suggests that the they are neither irrational nor incoherent but are, by way of contrast, purposive, loosely coupled, oriented toward the correction of network failures, and growing more important by the day.[93]

III. The Networked Economy in the Decentralized Polity

Our neo-Polanyian interpretation holds that the decentralization of production has made American industrial policy both more likely and more desirable than proponents of rival approaches allow. We addressed the issue of likelihood by attributing the unexpected growth of government intervention to a double movement in which (1) businesses responded to competitive threats and challenges by decentralizing production to their suppliers and subcontractors at home and abroad (2) policy makers responded to the job losses thereby engendered by looking for alternative sources of employment in innovative activities and, in so doing, found that (3) business opposition to their efforts had been mitigated—if by no means eliminated—by the very decentralization of production that had animated the job losses in the first place.[94] In other words, the previous section addressed the doubts of the neo-institutionalists in particular by attributing the origins of American industrial policy to a Polanyian double movement that pits business efforts to compete on the low road against admittedly embattled government efforts to pave a high road.

Are these efforts working? A substantial body of literature counsels a positive answer. After all, SBIR recipients grow faster and create more employment than comparable nonrecipients.[95] "A March 1999 study found that future returns from just three of the 50 completed ATP projects—improving automobile manufacturing processes, reducing the cost of blood and immune cell production, and using a new material for prosthesis devices—would pay for all the projects funded to date by the ATP."[96] MEP

receives similarly high marks.[97] And the return on NIH investment is staggering. For example, Kevin Murphy and Robert Topel recently found that between 1970 and 2000 public spending on medical research—the "vast majority" of which is run through the NIH—returned a *net* gain of $61 trillion in social value.[98]

Neo-institutionalist worries that industrial policies are likely to be captured or prove counterproductive in the American context would therefore appear to be misplaced. After all, U.S. industrial policies have catalyzed rather than coddled their beneficiaries and have thereby put paid to the expectations of their critics.[99] What explains the unanticipated success of the U.S. effort? We trace the answer to three broadly related features of industrial policymaking in the decentralized polity: experimentation, diversity, and access to local knowledge.

Experimentation

Industrial policy proponents have frequently bemoaned the apparent lack of coordinating capacity in the U.S. political system. The absence of an economic "pilot agency," they argue, deprives elite policy makers of the authority they would need to successfully control the commanding heights of the economy, and Chalmers Johnson therefore goes so far as to wonder whether Americans should be thinking about establishing their own pilot agency akin the to Ministry of Trade and Industry in Japan.[100]

The lack of a pilot agency has certain advantages, however, including the innate tendency toward experimentation that tends to occur in a decentralized policy environment and the corresponding likelihood that programs will be thoroughly tested in one agency or level of government before they are widely adopted. Take, for example, the ATP at NIST. According to Marian Negoita, the policy makers responsible for the program's design not only modeled the ATP on ARPA but appointed a former ARPA staffer, Arati Prabhakar, to direct the NIST as well.[101] "As the first woman to earn a Caltech PhD in applied physics and a veteran of the Pentagon's Advanced Research Projects Agency," adds Michael Schrage, "Prabhakar was impeccably qualified to transform what was once the National Bureau of Standards into an aggressive promoter of innovation investment."[102] While she would leave the NIST before realizing her goal, and the ATP would ultimately fall victim to the Republican budget axe, her experience underscores the potential not only for experimentation but for learning and knowledge transfer across the decentralized polity as well.

Nor is ATP unique. On the contrary, Paul Hallacher traces the origins of the MEP to a series of state-level manufacturing extension programs that are more than fifty years old and are themselves descendants of the agricultural extension services engendered by the Morrill Land Grant Act in the mid-nineteenth century.[103] Roland Tibbets traces the SBIR's origins to a successful pilot program he ran at the National Science Foundation in the 1970s.[104] And Matt Keller traces the rise of venture capital initiatives at the CIA, NASA, the Department of Defense, and national laboratories in the late 1990s to public venture capital initiatives that had already proven their mettle at the state level in an earlier period.[105]

Diversity

Experimentation not only raises the likelihood that programs are battle tested by the time they go national but also ensures that the overall program ecosystem thereby produced is a diverse and robust one. Programs are likely to grow from the bottom up, to compete for resources, and to withstand—and perhaps even take advantage of—threats to neighboring programs in potentially fruitful ways. The SBIR program provides a telling example. By compelling every federal agency with an annual research budget in excess of $100 million to participate, SBIR ensures that every agency "becomes an innovation agency" and thereby avoids the pitfalls of excess dependence on a single program or plan.[106]

The national laboratories operate in a similar manner. On the one hand, they are located in different parts of the country; managed by different contractors (e.g., the University of California, Lockheed Martin, the Battelle Institute, etc.); and in competition with each other for resources, contracts, and prestige, and they therefore mimic the best elements of the competitive marketplace. On the other hand, they offer their scientists job security and autonomy, and lab personnel therefore have the stability and the time horizons they need to work together in a farsighted and fruitful manner.[107]

In other words, the federal laboratories temper their interorganizational competition with intraorganizational buffers and thereby constitute a series of "public spaces" that add to the robustness and diversity of the national innovation ecosystem.[108] We can illuminate not only their role in the innovative effort but the broader implications of loose coupling by building on the ecosystem analogy and adding a deliberately mixed metaphor. The American innovation ecosystem plays host to relatively large populations of several different species (e.g., almost a dozen different agencies with R&D budgets large enough to qualify for SBIR, more than a dozen different institutes within the NIH, more than a dozen national laboratories at the Department of Energy, four hundred MEP service centers, dozens of research universities, etc.). The different organisms that make up the relevant populations pursue relatively narrow goals (e.g., intellectual property creation; technology transfer, licensing, and commercialization; export promotion; job creation) through a variety of different means. And the ecosystem as a whole is therefore diverse and robust. By letting a thousand flowers bloom, in short, U.S. industrial policy makers make sure that they will not back the wrong horse—or that if they do, the consequences are unlikely to be tragic.

Local Knowledge

We are by no means blind to the costs of subnational (or interstate) competition for employment, investment, and resources. After all, the economic war between the states escalated rapidly with the dawn of decentralized production: Bob Corker's constituents in Tennessee paid a mere $11,000 per job when their Nissan plant opened in 1981; by 1993, however, Alabama had to fork over $168,000 per job to lure Mercedes Benz.[109]

Beyond a certain point, however, the decentralization of production renders smokestack chasing not only globally irrational but locally irrational a well, for many of the jobs "created" by individual transplants are found at considerable distance from their new homes. Public officials therefore target their efforts less to participation in "location tournaments" than to the deliberate cultivation or construction of clusters of interdependent enterprises.[110] For instance, Barbara Stoller of Albuquerque's Sandia Laboratories notes that New Mexico "has clusters of government-savvy businesses and entrepreneurs, experienced in dealing with the Federal Government and knowing about the SBIR program" but that entrepreneurs who lack government experience are ignorant of the available opportunities and need to be encouraged to take advantage of SBIR.[111] "In addition to engineers and scientists," she concludes, "we are now interacting with farmers, ranchers, miners, and environmentalists, all of which have interesting technological ideas and all of which can benefit from SBIR funding."[112]

Stoller's comment underscores the local knowledge available to industrial policymakers and technologists in a decentralized political environment. While Sandia Labs are found in New Mexico, and therefore exploit ties to extractive industries and agriculture, Pacific Northwest National Laboratories are found in the state of Washington, and therefore hope to build a biotechnology cluster with help of the University of Washington, the Institute for Systems Biology, and the Fred Hutchison Cancer Research Center.[113]

Local knowledge is no less critical to the support of low-technology industries like the installation of countertops, however, and Deborah Grubbe of Dupont thus underscores the *particular* advantages of the MEP in continued congressional testimony.

> When one looks at our Corian finishers, at some level, because they are so dispersed, it is difficult for them to—for us to communicate to them, because they are not only selling Corian, they are selling other kinds of materials. And so without a unifying body that is local to them, like MEP that is located wherever we sell it, which is countrywide, without that we are unable to touch the local manufacturer as much a possible in the supply chain. So the more times that we can touch them, we not only improve the skill set for them to install Corian, we are also improving their overall employee skill sets for them to make their businesses better.[114]

Our goal is less to exaggerate the success than to emphasize the possibilities of the MEP. While Robert Turner admittedly found that many local extension centers had difficulty promoting cooperation among public and private sector actors, he simultaneously recognized that the program's decentralized nature offered novel opportunities: states and localities are given "the responsibility for designing centers to address regional issues" resulting in what is—at best—an extremely flexible program that provides ample space for variable strategies and local experimentation and thus reflects the "trappings of a new division of labor between the national government and states regarding economic development."[115]

Whitford underscores the new division in a case study of a consortium designed to deliver training services to the suppliers of many of Wisconsin's largest durable goods manufacturers.[116] The original equipment manufacturers (OEMs) who joined forces with the Wisconsin MEP to build the consortium not only improved the quality of the regional supply base upon which they had come to depend but did so by creating a public-private partnership that drew upon the mutual interests of customers and suppliers who hoped to improve competencies and foment more collaborative relationships down the road. In so doing, they not only fostered the nonmarket coordination of economic activity that is allegedly absent from the liberal market economy but simultaneously demonstrated that a lack of business coordinating capacity at the national level can potentially be overcome at the local level. While the consortium itself unraveled a few years later, and thereby validated neo-institutionalist fears about the limits to nonmarket coordination in the United States, some of the consortium's underlying concepts live on in the form of a broader program in which multiple MEPs coordinate supply chain modernization across state boundaries. Local-level experimentation, in short, serves as proof of concept. The existence of multiple centers—loose coupling and local knowledge—facilitates the extension of MEP efforts across multiple jurisdictions.

Neo-institutionalists might legitimately wonder whether manufacturing extension really responds to "firm needs with relative precision" or simply encourages "actors to perform more effectively."[117] Does the MEP reflect or transcend the limits of the liberal market economy? By way of response, we would like to invoke the testimony of an electrical equipment manufacturer in Missouri who turned to the MEP's service providers for help with "such techniques as Kanban, 5-S and others, known as lean manufacturing, all of which contributed to improved efficiency"; a Maryland precision equipment maker who appreciates "their help in our somewhat specialized manufacturing niche for which finding sources of expertise can be difficult"; and a component supplier in Michigan who compared the extension agents found at the Michigan Manufacturing Technology Center to

> their private sector counterparts. Most large private sector consultants do not actively solicit my business, and when they do, very junior level people have been assigned to perform the work. In addition, the services often were not tailored to fit my particular needs. The MMTC, on the other hand, aggressively marketed to me and continues to provide guidance about new services and programs that can help me remain competitive. I feel that they are very business savvy and very business conscious, and truly in my corner.[118]

Nor is the MEP exceptional. American industrial policies go beyond the preservation of market competition, maintenance of macroeconomic stability, and provision of public goods to address *firm-specific* needs in a host of different ways and through a variety of different agencies and, in so doing, raise the competitive prospects of the country as a whole.[119]

In fact, Block holds that the private sector's growing dependence on government support not only reveals the importance of U.S. industrial policy but simultaneously offers American progressives an "unprecedented opportunity" to transform national politics.[120] By supporting private firms that exhibit public spirited behavior—including firms that support educational investments that would ultimately be in their own interest as well—and withdrawing support from firms that "insist on their right to behave badly," he argues, industrial policymakers and their supporters can discourage "low-road" competitive strategies and build a high-road alternative. While Block's arguments are as plausible as they are appealing, they are nonetheless vulnerable to a subtle market fundamentalist counterattack and we therefore conclude our analysis of U.S. industrial policy by beginning to put the case for government intervention—and concomitant progressive politics—on a sounder theoretical footing.

IV. Conclusion

A substantial body of literature documents the origins and consequences of *sub rosa* industrial policies in the late-twentieth-century United States.[121] Our goal has been less to document than to account for the *birth* and *success* of U.S. industrial policies against the backdrop of earlier scholarship that questioned their very likelihood in a federal democracy with three coequal branches of government and a market fundamentalist ideology. Why have industrial policies proven more common or successful than the previous literature—and the neo-institutionalists in particular—would have allowed? We maintain that the spatial and organizational decentralization of production have simultaneously (1) broadened the coalition of industrial policy beneficiaries and (2) placed new demands on industrial policy makers—and have thereby transformed the industrial policy debate in new and unforeseen ways.[122]

The original industrial policy debate took place within the market failure paradigm of "government by exception: as long as the market mechanism functions successfully, it is preferred to government policy."[123] Public action is justified when (1) free markets fail to optimize social outcomes and (2) there is reason to believe that the government can do better, and market fundamentalists tend to believe that the two conditions are rarely met.[124]

Over the course of the past two decades, however, two important features of capitalist societies have become more clear to reasoned observers: First, the omnipresence of market failure means that "the exceptions become the rule" and government intervention becomes pervasive.[125] And second, "network forms of organization" have not only assumed their rightful positions as distinct mechanisms of governance—alongside markets and hierarchies—but have proven particularly central to precisely the sorts of innovation-based industries the U.S. government is targeting.[126]

Our research illuminates and underscores the importance of both features of capitalist society. While public officials target resources, transfer technology, set standards, disseminate knowledge, and thereby manipulate the country's trajectory in a manner unforeseen by proponents of path dependence, their private sector interlocutors are

linked "neither by discrete exchanges nor by administrative fiat, but through networks of individuals engaged in reciprocal, preferential, mutually supporting actions."[127] Examples would include the purchasing agents at the Detroit Three and their myriad parts suppliers, program managers in the federal laboratories and their private sector partners, and the thousands of countertop fabricators who work with Dupont as well as their local manufacturing extension agents.

The omnipresence of both government intervention and network forms of economic organization betray the limits of models that assume "that markets are the starting point, the elemental form of exchange out of which other methods evolve" and thereby challenges the utility of the market failure paradigm.[128] In that sense, our findings simultaneously underscore the importance of Polanyian efforts "to shift the discussion from a conventional focus on market failure to a broader notion of *governance failure*" and expose their chief limitation.[129] We have theories of market failure and organizational failure that we can use to guide policy interventions, but we have no corresponding theory of network failure—that is, situations in which network production would prove desirable were it to obtain but for some reason fails to emerge, survive, or meet expectations. Public officials who encounter network failures are therefore encouraged or tempted to fall back into the market failure paradigm and to thereby adopt policies that either improve market functioning or subordinate markets to hierarchies rather than policies that build and support decentralized production networks.

The debate over the ATP provides a particularly apposite example. While market fundamentalists asserted that the "market failures that make the NSF necessary do not apply to the ATP, as companies have every incentive to fund this profitable research on their own," they ignored the fact that ATP program officers built networks as well as markets and that the latter were no less important than the former.[130] For example, Maryann Feldman and Maryellen Kelley compared ATP award winners and nonwinners and found that the former were not only more likely to collaborate with new partners but to sustain their collaborations into the future than the latter. "Paradoxically," they argue, "the profit incentive that motivates innovative activity by an individual firm also discourages information sharing and collaborative R&D activities between companies."[131]

Our article therefore highlights not only the utility of a neo-Polanyian approach to the study of comparative capitalism but the need for a theory capable of transforming network governance from a serendipitous but exceptional outcome to a politically defensible and manageable process. The building blocks of such a theory are readily available. Others have taken governance theorists to task for their failure to address network failure in a systematic manner. And insofar as we are correct, and the market failure paradigm justifies a retreat from network governance, that failure is likely to prove economically as well as theoretically consequential. Social scientists would therefore do well to develop and test a theory of network failure in the years to come.[132]

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Notes

1. Frank Dobbin, Review of Otis Graham Jr., "Losing Time: The Industrial Policy Debate," *Contemporary Sociology* 22, no. 2 (1993): 251.
2. Ibid. See also Dobbin, *Forging Industrial Policy: The United States, Britain, and France in the Railway Age* (Princeton, NJ: Princeton University Press, 1994); John Campbell, "The State and the Nuclear Waste Crisis: An Institutional Analysis of Policy Constraints," *Social Problems* 34, no. 1 (1987): 18–33; Alex Hicks, "National Collective Action and Economic Performance: A Review Article," *International Studies Quarterly* 32, no. 2 (1988): 131–53; William Dietrich, *In the Shadow of the Rising Sun: The Political Roots of American Economic Decline* (University Park: Pennsylvania State University Press, 1991); Kenneth Finegold and Theda Skocpol, *State and Party in America's New Deal* (Madison: University of Wisconsin Press, 1995); and Harold Wilensky, *Rich Democracies: Political Economy, Public Policy, and Performance* (Berkeley: University of California Press, 2002).
3. See Andrew Schrank and Josh Whitford, "The Anatomy of Network Failure," unpublished paper (Albuquerque and NY: University of New Mexico and Columbia University, 2009) on network failure; as well as Francis Bator, "The Anatomy of Market Failure," *Quarterly Journal of Economics* 72, no. 3 (1958): 351–79; Kenneth Arrow, "The Organization of Economic Activity: Issues Pertinent to the Choice of Market versus Nonmarket Allocation," in *US Joint Economic Committee, the Analysis and Evaluation of Public Expenditure* (Washington, DC: Government Printing Office, 1969); Marshall Meyer and Lynne Zucker, *Permanently Failing Organizations* (Newbury Park, CA: Sage, 1989); Mrinal Datta-Chaudhuri, "Market Failure and Government Failure," *Journal of Economic Perspectives* 4, no. 3 (1990): 25–39; and Lee Clarke and Charles Perrow, "Prosaic Organizational Failure," *American Behavioral Scientist* 39, no. 8 (1996): 1040–56 on market and organizational failures.
4. See Fred Block, "Political Choice and the Multiple 'Logics' of Capital," *Theory and Society* 15, no. 1/2 (1986): 178; as well as Fred Block, "Understanding the Diverging Trajectories of the United States and Europe: A Neo-Polanyian Analysis," *Politics and Society* 35, no. 1 (2007): 3–33; and Karl Polanyi, *Great Transformation: The Political and Economic Origins of Our Time* (Boston: Beacon, 1944/2001).

5. Dobbin, *Forging Industrial Policy*; and Finegold and Skocpol, *State and Party in America's New Deal* provide path-dependent accounts of U.S. economic policy making. The Office of Technology Assessment (OTA), *U.S. Industrial Competitiveness: A Comparison of Steel, Electronics, and Automobiles* (Washington, DC: OTA, 1981), 175; and Lane Kenworthy, *In Search of National Economic Success: Balancing Competition and Cooperation* (Newbury Park, CA: Sage, 1995), 99, discuss the market failure rationale for industrial policy in particular.
6. Chalmers Johnson, ed., *The Industrial Policy Debate* (San Francisco: ICS Press, 1984).
7. Walter Powell, "Neither Market nor Hierarchy: Network Forms of Organization," in *Research in Organizational Behavior*, ed. Barry Staw and L. L. Cummings (Greenwich, CT: JAI, 1990).
8. Chalmers Johnson, *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975* (Palo Alto, CA: Stanford University Press, 1982), 323.
9. Block, "Understanding the Diverging Trajectories of the United States and Europe," 5.
10. Ibid., 7.
11. Ibid. See also Marc Schneiberg, "What's on the Path? Path Dependence, Organizational Diversity and the Problem of Institutional Change in the US Economy, 1900-1950," *Socio-Economic Review* 5, no. 1 (2007): 47–80.
12. See Fred Block, "One World or Three? Globalization and the Future of Welfare Capitalism," unpublished paper (Davis: University of California, Davis, 2003); Block, "Political Choice and the Multiple 'Logics' of Capital," 190; and Block, "Understanding the Diverging Trajectories of the United States and Europe," 5–10. In the latter paper, Block isolates four broad neo-Polanyian theses: embeddedness, the double movement, the heterogeneity of capitalist interests, and variable national responses to international competition. In personal correspondence, however, Block acknowledges that his third and fourth theses are really different dimensions of a more general commitment to the "multiple logics of capital" that he had already explored in his 1986 paper. We therefore pursue parsimony by collapsing his third and fourth theses. See also Peter Evans, "Is an Alternative Globalization Possible?" *Politics & Society* 36, no. 2 (2008): 271–305.
13. Fred Block, "Swimming against the Current: The Rise of a Hidden Developmental State in the United States," *Politics & Society* 36, no. 2 (2008): 169–206. See also Johnson, *MITI and the Japanese Miracle*; John Zysman, *Government, Markets, and Growth: Financial Systems and Politics of Industrial Change* (Ithaca, NY: Cornell University Press, 1983); Peter Katzenstein, *Small States in World Markets: Industrial Policy in Europe* (Ithaca, NY: Cornell University Press, 1985); Sharon Zukin, *Industrial Policy: Business and Politics in the United States and France* (New York: Praeger, 1985); and Ronald Dore, *Flexible Rigidities: Industrial Policy and the Structural Adjustment in the Japanese Economy* (Stanford, CA: Stanford University Press, 1986).
14. Block, "Swimming against the Current."
15. Block, "Understanding the Diverging Trajectories of the United States and Europe," 7.
16. Gary Becker, "The Best Industrial Policy Is None at All," *Business Week* (August 25, 1985). See also Bruce Bartlett, "Trade Policy and the Dangers of Protectionism," in *The*

Industrial Policy Debate, ed. Chalmers Johnson (San Francisco: ICS Press, 1984); Don Lavoie, "Two Varieties of Industrial Policy: A Critique," *Cato Journal* 4, no. 2 (1984): 457–83; and Paul Craig Roberts, "The Asian Crisis Proves That Industrial Policy Doesn't Pay," *Business Week* (December 22, 1997).

17. Barry Bluestone and Bennett Harrison, *Deindustrialization of America: Plant Closings, Community Abandonment and the Dismantling of Basic Industry* (New York: Basic Books, 1982); and Robert Reich, *The Next American Frontier* (New York: Times Books, 1983).
18. Cf. Reich, *The Next American Frontier*, 5; and Block, "Understanding the Diverging Trajectories of the United States and Europe," 9. Market skeptics neither offer nor adhere to a general theory of political and economic change. While Reich discusses the "pendulum-like vacillation" of "civic culture" and "business culture" in the United States, his pendulum bears little relation to Polanyi's double movement—in that he portrays the "next American frontier" as the transcendence of the pendular swing—and his own understanding of Polanyi's work is neither sympathetic nor subtle. See Reich, *The Next American Frontier*, 8, 21, 275; as well as Robert Reich, "The Second Great Transformation," Lecture at the Occasion of the Dagmar and Václav Havel Foundation Vize 97 Prize (2003).
19. Cf. Kenneth Noble, "Regan Belittles Idea of U.S. Industrial Policy," *New York Times* (October 15, 1983); and Otis Graham Jr., *Losing Time: The Industrial Policy Debate* (Cambridge, MA: Harvard University Press, 1992).
20. Ira C. Magaziner and Robert B. Reich, *Minding America's Business: The Decline and Rise of the American Economy* (New York: Vintage Books, 1982), 378–79. See also Bluestone and Harrison, *Deindustrialization of America*; Alan Kantrow, "The Political Realities of Industrial Policy," *Harvard Business Review* 61, no. 5 (1983): 81–82; Mel Dubnick, "American States and the Industrial Policy Debate," *Policy Studies Review* 4, no. 1 (1984): 25; and Ellis Krauss and Jon Pierre, "Targeting Resources for Industrial Change," in *Do Institutions Matter? Government Capabilities in the United State and Abroad*, ed. R. Kent Weaver and Bert Rockman (Washington, DC: Brookings Institution, 1993), 181–83.
21. Peter Hall and David Soskice, "Introduction," in *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, ed. Peter Hall and David Soskice (Oxford: Oxford University Press, 2001), 47. See also R. Kent Weaver, *The Politics of Industrial Change: Railway Policy in North America* (Washington, DC: Brookings Institution, 1985); Zysman, *Government, Markets, and Growth*; Dobbin, *Forging Industrial Policy*; and Finegold and Skocpol, *State and Party in America's New Deal.*
22. Michael Mann, "Has Globalization Ended the Rise and Rise of the Nation State?" *Review of International Political Economy* 4, no. 3 (1997): 472–96, at 484. See also Zysman, *Government, Markets, and Growth*, 281; R. Kent Weaver and Bert Rockman, "When and How Do Institutions Matter?" in Weaver and Rockman, *Do Institutions Matter?* 456; and Wilensky, *Rich Democracies*, 93.
23. Fred Block and Matthew Keller, "Where Do Innovations Come From? Transformations in the US Economy, 1970–2006," *Socio-Economic Review* 7, no. 3 (2009): 460.
24. Block, "Understanding the Diverging Trajectories of the United States and Europe," 12.
25. Block, "Swimming against the Current," 179.

26. Kevin Phillips, "U.S. Industrial Policy: Inevitable and Ineffective," *Harvard Business Review* 70, no. 4 (1992): 104.
27. Krauss and Pierre, "Targeting Resources for Industrial Change," 186.
28. Hall and Soskice, "Introduction," 49.
29. See Block, "Swimming against the Current," 198. Finegold and Skocpol draw an important distinction between advocates of "hard" sectoral policies like Robert Reich and Lester Thurow; proponents of "softer" competitiveness policies—including the provision of public goods—like Amitai Etzioni; and opponents of industrial policy writ large. See Finegold and Skocpol, *State and Party in America's New Deal*, 224–33. Our classification maps onto—if by no means reduces to—their distinction in that advocates of sectoral policies tend to be liberal market skeptics, proponents of softer (or market-incentive) policies tend to be neo-institutionalists, and opponents of softer as well as harder policies tend to be market fundamentalists. A key point worth underscoring, however, is that institutionalists acknowledge the social construction of markets; they simply believe that in the Anglo-American institutional context they are better constructed in a broadly liberal manner.
30. Statement of Raymond G. Kammer, Director, National Institute for Standards and Technology, Technology Administration, Department of Commerce, House Committee on Science, Subcommittee on Technology (September 23, 1999), 17.
31. Block, "Swimming against the Current," 179–80.
32. Henry Etzkowitz et al., "Pathways to the Entrepreneurial University; Towards a Global Convergence," *Science and Public Policy* 35, no. 9 (2008): 681–95, at 685.
33. Block and Keller, "Where Do Innovations Come From?" See also Statement of Allen Li of the General Accounting Office Hearing on "Measuring Performance: Challenges in Evaluating Research and Development," House Committee on Science, Subcommittee on Technology (April 10, 1997).
34. OTA, *Competing Economies: America, Europe, and the Pacific Rim* (Washington, DC: OTA, 1991), 110; Rosalie Ruegg, "Delivering Public Benefits with Private Sector Efficiency through the ATP," in *The Advanced Technology Program: Assessing Outcomes*, ed. Charles Wessner (Washington, DC: National Academy Press, 2001), 121; and Roland Tibbetts, "SBIR, Renewal, and US Economic Security," unpublished paper (2006), 5.
35. David Connell, *"Secrets" of the World's Largest Seed Capital Fund: How the United States Government Uses Its Small Business Innovation Research (SBIR) Programme and Procurement Budgets to Support Small Technology Firms* (Cambridge, UK: Centre for Business Research, 2006), 3.
36. Block, "Swimming against the Current," 176.
37. Steven Mufson, "U.S. in Control: Its Goal to Fix, Not Run, Firms," *Washington Post* (April 29, 2009).
38. Peter Wallsten and Jim Tankersley, "Remaking Detroit: Politics and Possibilities," *Los Angeles Times* (March 31, 2009). See also Paul Starobin, "The Economic Crisis: Washington's Sad Triumph," *National Journal* (January 23, 2009); David Sanger and Bill Vlasic, "Chrysler's Fall May Help Obama to Reshape GM," *New York Times* (May

2, 2009); and Peter Gosselin, "Obama Assigns Centrists to Make Radical Economic Moves," *Los Angeles Times* (November 25, 2008).

39. Colin Crouch, *Capitalist Diversity and Change: Recombinant Governance and Institutional Entrepreneurs* (Oxford: Oxford University Press, 2005), 24. See also Block, "Swimming against the Current," 179.
40. Krauss and Pierre, "Targeting Resources for Industrial Change," 186.
41. Hall and Soskice, "Introduction."
42. Block, "Swimming against the Current," 179. See also Crouch, *Capitalist Diversity and Change*, 135; Etzkowitz et al., "Pathways to the Entrepreneurial University," 685.
43. Glenn Fong, "State Strength, Industry Structure, and Industrial Policy: American and Japanese Experiences in Microelectronics," *Comparative Politics* 22, no. 3 (1990): 276. See also Magaziner and Reich, *Minding America's Business*, 378; and Eugene Bardach, "Implementing Industrial Policy," in *The Industrial Policy Debate*, ed. Chalmers Johnson (San Francisco: ICS Press, 1984), 103 on interregional conflicts; Dubnick, "American States and the Industrial Policy Debate"; and Wilensky, *Rich Democracies* on conflicts between Washington and state governments; and Joseph Badaracco and David Yoffie, "Industrial Policy: It Can't Happen Here," *Harvard Business Review* (November-December 1983): 99 on conflicts between the executive and the courts.
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46. See, e.g., Nick Cullather, "Fuel for the Good Dragon: The United States and Industrial Policy in Taiwan, 1950-1965," *Diplomatic History* 20, no. 1 (1996): 1–25; and Andrew Schrank, "Foreign Investors, 'Flying Geese,' and the Limits to Export-Led Industrialization in the Dominican Republic," *Theory and Society* 32, no. 4 (2003): 415–43 on overseas trouble spots; and Bill Luker, "The Public Sector and Sunbelt Development," *Challenge* 40 (1997); pp. 58-62. Ann Markusen, *The Rise of the Gunbelt: The Military Remapping of Industrial America* (Oxford: Oxford University Press, 1991); and Gavin

Wright, "The Economic Revolution in the American South," *Journal of Economic Perspectives* 1 (Summer 1987), pp. 161-178, on the domestic periphery.

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48. Andrew Schrank, "Green Capitalists in a Purple State: Sandia National Laboratories and the Renewable Energy Industry in New Mexico," Project on Innovation Policy Working Paper no. 5 (Davis: Institute of Governmental Affairs, University of California, Davis, 2008).
49. Tom Baldwin, "North and South Split as 'Car Wars' Rev Up in Battle over $14bn Bailout," *Times of London* (December 15, 2008); and Daniel Gross, "Southern Comfort," *Newsweek* (December 22, 2008).
50. Peter Boyer, "The Road Ahead: Smyrna, Tennessee V. Detroit," *New Yorker* (April 29, 2009). Cf. James Inhofe, "Sen. Inhofe Outlines Concerns on Auto Bailout Bill," *US Fed News* (December 10, 2008); and Judd Gregg, "Sen. Gregg Comments on Auto Bailout, Concerns about Using Tarp Funds for the Big Three," *US Fed News* (December 12, 2008).
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52. David Cole et al., *Car Research Memorandum: The Impact on the U.S. Economy of a Major Contraction of the Detroit Three Automakers* (Ann Arbor, MI: Center for Automotive Research, 2008), 3. Cole et al. provide rigorous estimates of the supplier shocks engendered by the potential collapse of the U.S. automakers and their impacts on foreign transplants. See also Peter Whoriskey, "Senator Corker Faces Backlash at Home," *Washington Post* (December 12, 2008), D-1; as well as Boyer, "The Road Ahead"; and Todd Spangler, "GOP Senator Fighting Like a Mich. Dem to Keep GM Plant Open," *Detroit Free Press* (April 10, 2009).
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55. Charles Wessner, ed., *An Assessment of the SBIR Program*, National Research Council (Washington, DC: National Academies Press, 2008), 3, 42, 45.
56. Statement of Robert M. Berdahl, President, Association of American Universities, House Committee on Science and Technology, Subcommittee on Technology and Innovation (April 23 2009).
57. Alan Hughes, "Innovation Policy as Cargo Cult: Myth and Reality in Knowledge-Led Productivity Growth," Institute for Technology, Enterprise and Competitiveness (ITEC)

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60. James Rottsolk, Statement of James E. Rottsolk, Chairman, President and CEO, Cray Inc., Hearing on "Advanced Manufacturing and Biotechnology," Senate Committee on Commerce, Science, and Transportation (April 14, 2003); and Oak Ridge National Laboratories (ORNL), *Partnership Success Story: ORNL and General Electric Collaborate on Superefficient Water Heater* (Oak Ridge, TN: ORNL, 2008).
61. See Andrew Lawler, "Neutron Scattering: Green Light for Long-Awaited Facility," *Science* 279, no. 23 (1998): 470–71; as well as the Prepared Statement of the Biotechnology Industry Organization, Hearing on "Departments of Labor, Health and Human Services, Education, and Related Agencies, Appropriations for Fiscal Year 2000," Senate Appropriations Committee (February 23, 1999). Furthermore, the Ad Hoc Group for Medical Research aggregates more than two hundred pharmaceutical firms, universities, and nonprofit organizations into a coalition dedicated exclusively to increasing National Institutes of Health (NIH) funding. "When the organization was founded in 1982," writes one observer, "the NIH's annual budget was almost $4 billion; today it is close to $30 billion." See Coco Ballantyne, "The Lobbying Landscape and Beyond: 15 Groups to Know," *Nature Medicine* 14, no. 10 (2008): 1002–3.
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Hearing on "Fiscal Year 2005 NIST Budget: Views from Industry," House Committee on Science, Subcommittee on Environment, Technology, and Standards (April 28, 2004).

63. Statement of Ms. Deborah L. Grubbe, Corporate Director for Safety and Health, Dupont, 21.
64. Letter to the House of Representatives from the Alliance for Science and Technology Research in America, Hearing on "Fiscal Year 2005 NIST Budget: Views from Industry," House Committee on Science, Subcommittee on Environment, Technology, and Standards (April 28, 2004).
65. Wilensky, *Rich Democracies*, 93. See also the Statement by the Institute of Electrical and Electronics Engineers–United States of America (IEEE-USA), Hearing on "Fiscal Year 2005 NIST Budget: Views from Industry," House Committee on Science, Subcommittee on Environment, Technology, and Standards (April 28, 2004), 62.
66. Bardach, "Implementing Industrial Policy," 98; Melvyn Krauss, "Europeanizing' the US Economy: The Enduring Appeal of the Corporatist State," in *The Industrial Policy Debate*, ed. Chalmers Johnson (San Francisco: ICS Press, 1984), 90.
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69. Magaziner and Reich, *Minding America's Business*, 255.
70. Powell, "Neither Market nor Hierarchy"; Joel Podolny and Karen Page, "Network Forms of Organization," *Annual Review of Sociology* 24 (1998): 57–76; and Laurel Smith-Doerr and Walter Powell, "Networks and Economic Life," in *The Handbook of Economic Sociology*, ed. Neil Smelser and Richard Swedberg, 2nd ed. (Princeton, NJ: Princeton University Press, 2005).
71. See, inter alia, AnnaLee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Cambridge, MA: Harvard University Press, 1994); Walter W. Powell et al., "The Spatial Clustering of Science and Capital," *Regional Studies* 36, no. 3 (2002): 299–313; Judith Jordan and Julian Lowe, "Protecting Strategic Knowledge: Insights from Collaborative Agreements in the Aerospace Industry," *Technology Analysis and Strategic Management* 16, no. 2 (2004): 241–59; and Josh Whitford, *The New Old Economy: Networks, Institutions, and the Organizational Transformation of American Manufacturing* (Oxford: Oxford University Press, 2005).
72. Powell, "Neither Market nor Hierarchy," 328, 385.
73. Smith-Doerr and Powell, "Networks and Economic Life," 380.
74. Schrank and Whitford, "The Anatomy of Network Failure."
75. Bruce Kogut, "The Stability of Joint Ventures: Reciprocity and Competitive Rivalry," *Journal of Industrial Economics* 38, no. 2 (1989): 183–98, at 187. See also Seung Ho Park and Michael Russo, "When Competition Eclipses Cooperation: An Event History Analysis of Joint Venture Failure," *Management Science* 42, no. 6 (1996): 875–90.
76. *The Economist*, "Flying in Formation" (July 22, 1995), 59–60.

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78. Andreas Papandreou, *Externality and Institutions* (Oxford, UK: Clarendon, 1994), 5–6. See, e.g., Stuart Leslie and Robert Kargon, "Selling Silicon Valley: Frederick Terman's Model of Regional Advantage," *Business History Review* 70 (1996): 435–72; and Stuart Leslie, "Regional Disadvantage: Replicating Silicon Valley in New York's Capital Region," *Technology and Culture* 42, no. 2 (2001): 236–64.
79. Meyer and Zucker, *Permanently Failing Organizations*, 19. See, e.g., Howard Aldrich and Martin Reuf, *Organizations Evolving* (Thousand Oaks, CA: Sage, 2006).
80. Hall and Soskice, "Introduction," 53. Cf. Block and Keller, "Where Do Innovations Come From?"
81. Jeanne W Powell, "Advanced Technology Program—Development, Commercialization, and Diffusion of Enabling Technologies: Progress Report for Projects Funded 1993-1995," NISTIR 6098 (Gaithersburg, MD: National Institute of Standards and Technology 1997), 41.
82. See Erica Fuchs, "The Role of DARPA in Seeding and Encouraging New Technology Trajectories: Pre- and Post- Tony Tether in the New Innovation Ecosystem," Project on Innovation Policy Working Paper no. 2, Institute of Governmental Affairs (Davis, University of California, Davis, 2008); as well as Schrank, "Green Capitalists in a Purple State."
83. For instance, the Small Business Innovation Research (SBIR) program hosts an annual conference for Phase II award recipients that includes "reviews of technical and commercial progress, networking among grantees and potential investors, and training sessions on intellectual property protection, licensing strategy and investment strategies." See Testimony of Kesh Narayanan, Division Director, Industrial Innovation and Partnerships (IIP), Directorate for Engineering National Science Foundation, House Committee on Science and Technology, Subcommittee on Technology and Innovation (June 26, 2007). Individual agencies and states host conferences of their own and in some cases provide mentoring programs that link commercially viable SBIR alumni to recent award recipients. See Innovation Associates, *Commercialization Needs of SBIR Firms* (Washington, DC: Department of Agriculture, 2001), 25.
84. John Padgett, "Hierarchy and Ecological Control in Federal Budgetary Decision Making," *American Journal of Sociology* 87, no. 1 (1981): 75–129, at 82.
85. Etzkowitz et al., "Pathways to the Entrepreneurial University," 685.
86. National Science Board, *Science and Engineering Indicators*, vol. 1, 8–94; and the Statement of Barbara Stoller, Director, SBIR Outreach Program, Technology Ventures Inc., Hearing on "Present and Future of the SBIR, FAST, and MEP Programs," House Committee on Small Business, Subcommittee on Workforce, Empowerment, and Government Programs (May 6, 2003), 50–51.
87. Statement of Jo Anne Goodnight, SBIR/STTR Program Coordinator, Hearing on "SBIR: Advancing Medical Breakthroughs," House Committee on Small Business, Subcommittee on Investigations and Oversight (February 13, 2008). Sandia National Laboratories

not only pursues SBIR grants with abandon but boast a unique partnership with the New Mexico Manufacturing Extension Partnership (MEP). MEP staffers are "embedded" in the labs. They not only work on technology transfer to private businesses but also help ensure the quality and efficiency of the lab's supplier base. See Innovation Associates, *Commercialization Needs of SBIR Firms*.

88. Charles Wessner, "The Advanced Technology Program: It Works," *Issues in Science and Technology* 18, no. 1 (2001): 59–64, at 63.
89. National Science Board, *Science and Engineering Indicators*, vol. 1, 8–70.
90. Ibid., 8–94.
91. Charles Wessner, ed., *An Assessment of the SBIR Program*, National Research Council (Washington, DC: National Academies Press, 2009), 45. New Hampshire's story is a variation on the theme. A single engineering services firm, Creare, is not only responsible for a vastly disproportionate share of the state's SBIR awards—and the third most successful applicant in the history of the program—but the source of more than a dozen spin-off firms with hundreds of employees and a quarter of a billion dollars in annual revenue. Bob Dean, who founded Creare in 1961, was a former Dartmouth engineering professor; and Jim Block, who served as president of the company in the 1980s, had links to New Hampshire Senator Warren Rudman, a key sponsor of the original SBIR legislation. "As a consequence, the company knew that SBIR was on its way. Creare was among the first firms to apply for, and to receive, an SBIR award." See Philip Auerswald, "Creare, Inc," in *An Assessment of the SBIR Program*, ed. Charles Wessner and National Research Council (Washington, DC: National Academies Press, 2008).
92. Charles Wessner, Comments, Hearing on "An Assessment of Federal Funding for Private Research and Development," Senate Committee on Homeland Security and Governmental Affairs, Subcommittee on Federal Financial Management, Government Information, and International Security (May 26, 2005), 15.
93. No less telling is Henry Etzkowitz's interview with an SBIR program founder who admits that "we definitely see the programs as a de facto industrial policy, but we cannot use that term, so we usually call it R&D policy and things like that instead." See Etzkowitz et al., "Pathways to the Entrepreneurial University," 314.
94. Whitford and Zeitlin, "Governing Decentralized Production"; and Robert Atkinson, "Deep Competitiveness," *Issues in Science and Technology* 23, no. 2 (2007): 69–75, at 70.
95. Connell, *"Secrets" of the World's Largest Seed Capital Fund*; and Ronald Cooper, "Purpose and Performance of the Small Business Innovation Research (SBIR) Program," *Small Business Economics* 20 (2003): 137–51. Furthermore, David Audretsch and his colleagues conclude that 20 percent of SBIR recipients would never have started their firms, and almost half would have abandoned their firms, without the awards. See Audretsch, Weigand, and Weigand, "The Impact of the SBIR on Creating Entrepreneurial Behavior."
96. Prepared Opening Statement of Senator Carl Levin, Hearing on "An Assessment of Federal Funding for Private Research and Development," Senate Committee on Homeland Security and Governmental Affairs, Subcommittee on Federal Financial Management,

Government Information, and International Security (May 26, 2005), 9. See also Maryann Feldman and Maryellen Kelley, "Leveraging Research and Development: Assessing the Impact of the U.S. Advanced Technology Program," in *The Advanced Technology Program: Assessing Outcomes*, ed. Charles Wessner (Washington, DC: National Academy Press, 2001); and Wessner, "The Advanced Technology Program: It Works."

97. Statement of Raymond G. Kammer, Director, National Institute for Standards and Technology, Technology Administration, Department of Commerce, before the House Committee on Science, Subcommittee on Technology (September 23, 1999).
98. Kevin Murphy, and Robert Topel, "The Value of Health and Longevity," unpublished paper (Chicago: University of Chicago, 2005), 34. See also Elias Zerhouni, "NIH in the Post-doubling Era: Realities and Strategies," *Science* 314 (2006): 1088–90.
99. Bardach, "Implementing Industrial Policy," 106; John Zysman and Laura Tyson, "American Industry in International Competition," in *American Industry in International Competition*, ed. John Zysman and Laura Tyson (Ithaca, NY: Cornell University Press, 1984), 22.
100. Johnson, *MITI and the Japanese Miracle*. See also Chalmers Johnson, "Who's Afraid of Industrial Policy?" *New York Times* (September 16, 1990).
101. Marian Negoita, "To Hide or Not to Hide? The ATP in the Future of US Civilian Technology Policy," Project on Innovation Policy Working Paper no. 4 (Davis: Institute of Governmental Affairs, University of California, Davis, 2008).
102. Michael Schrage, "A Technocrat Faces the GOP Assault on Government's Role in Innovation," *Washington Post* (November 18, 1994).
103. Paul Hallacher, *Why Policy Issue Networks Matter: The Advanced Technology Program and the Manufacturing Extension Partnership* (Lanham, MD: Rowman & Littlefield, 2005), 54.
104. Tibbetts, "SBIR, Renewal, and US Economic Security," 1. See also Connell, *"Secrets" of the World's Largest Seed Capital Fund*, 6.
105. Matthew Keller, "The Rise of Public Sector Venture Capital Initiatives in the United States," Project on Innovation Policy Working Paper no. 6 (Davis: Institute of Governmental Affairs, University of California, Davis, 2008). See also Kevin Leicht and J. Craig Jenkins, "Political Resources and Direct Intervention: The Adoption of Public Venture Capital Programs in the American States," *Social Forces* 76 (1998): 1323–46 on the state-level origins of public venture capital; and Phaedra Hise, "New Recruitment Strategy: Ask Your Best Employees to Leave," *Inc* 19 (July 1997): 28; and Schrank, "Green Capitalists in a Purple State" on the origins and diffusion of "entrepreneurial separation" programs that have spawned technology transfers at the national laboratories by giving lab scientists and engineers the right to take leaves of absence to commercialize their technologies without risking their jobs and benefits at the labs themselves.
106. Göran Marklund, "Swedish Small Business Innovation Policy: Design and International Outlook," paper presented at conference on "The Innovation Imperative: Globalization and National Competitiveness" (George Washington University, Washington, DC, April 27, 2006).
107. See Schrank, "Green Capitalists in a Purple State." Employment security in the DOE weapons laboratories would appear to be at a low point today but appears to be relatively high in comparative terms. See Jeff Johnson, "DOE Weapons Labs at a Crossroad," *Chemical and Engineering News* 87, no. 2 (2009): 32–34.

108. Richard Lester and Michel Piore, *Innovation: The Missing Dimension* (Cambridge, MA: Harvard University Press, 2004).
109. Bartik estimates that some $20-30 billion is spent annually in the United States for economic development, most of which simply goes to tax incentives to attract branch plants. He notes that "many location and expansion decisions are unchanged by incentives. The cost of incentives to businesses whose location decisions are unchanged exceeds the taxes from businesses whose location decisions are changed. The average net governmental cost per job created by incentives is around $4000 annually for the life of the plant." See Tim Bartik, "Economic Development Incentive Wars," *Employment Research* (spring 1995): 1–4; as well as Bartik, "Thoughts on American Manufacturing Decline and Revitalization" (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2003).
110. Paul David, "Comment on 'The Role of Geography in Development,' by Paul Krugman," in *Annual World Bank Conference on Development Economics 1998*, ed. B. Pleskovic and Joseph Stiglitz (Washington, DC: World Bank, 1999).
111. Statement of Barbara Stoller, Director, SBIR Outreach Program, Technology Ventures Inc., 50.
112. Ibid., 52. Ron Martin and Peter Sunley label the idea of the "cluster" as the focus of economic development policy an overly simplistic "policy panacea." See Martin and Sunley, "Deconstructing Clusters: Chaotic Concept or Policy Panacea?" *Journal of Economic Geography* 3, no. 1 (2003): 5–35. Our goal is less to resolve the debate than to note the shift—from a focus on luring transplants to a focus on cluster formation—and recognize the many states that have formed cluster initiatives. See Mary Jo Waits, "The Added Value of the Industry Cluster Approach to Economic Analysis, Strategy Development, and Service Delivery," *Economic Development Quarterly* 14, no. 1 (2000): 35–50.
113. Statement of James E. Rottsolk, Chairman, President, and CEO, Cray Inc., 23. Oak Ridge National Laboratories are taking advantage of their rural Tennessee base to pursue a sophisticated biofuels initiative in conjunction with Dupont, the University of Tennessee–Knoxville, and dozens of nearby farmers. See Lamar Alexander, "Producing Clean Energy in Tennessee," Weekly Column (October, 19 2008), http://alexander.senate.gov/public/index.cfm?FuseAction=Columns.Detail&Column_id=4543cab7-71bc-4dab-9aa0-321f8e2470ef&Month=10&Year=2008; as well as Pete Engardio, "State Capitalism," *Business Week* (February 9, 2009).
114. Statement of Ms. Deborah L. Grubbe, 46.
115. Robert Turner, "Public Policies for Manufacturing Revitalization: Competing Models in Three American States" (PhD Thesis, University of Wisconsin–Madison, 1999), 218–19, 222.
116. Whitford, *The New Old Economy*.
117. Hall and Soskice, "Introduction," 47.
118. Statement of Rolf Albers, Chairman and CEO, Albers Manufacturing, Hearing on "Present and Future of the SBIR, FAST, and MEP Programs," House Committee on Small Business, Subcommittee on Workforce, Empowerment, and Government Programs (May 6, 2003), 9; John Churchill, Testimony of John Churchill, Quality Assurance Director, Wilcoxon Research, Gaithersburg, Maryland, Hearing on "Small Manufacturing

and the Challenges of the New Millennium," House Committee on Science, Subcommittee on Technology (September 23, 1999), 40; and Norman Braddock, Testimony of Norman Braddock, President of Saginaw Remanufacturing, Saginaw, Michigan, Hearing on "Small Manufacturing and the Challenges of the New Millennium," House Committee on Science, Subcommittee on Technology (September 23, 1999), 47.

119. Industrial policies like SBIR and the Advanced Technology Program (ATP) are so successful, in fact, that they are being mimicked by a number of U.S. competitors, including the very "coordinated market economies" they were originally designed to combat—thus giving the lie to the more "rigid" approaches to the study of comparative capitalism and bolstering the case for cross-national learning, imitation, and hybridization. See, for example, Göran Marklund, "Swedish Small Business Innovation Policy: Design and International Outlook"; Matthew Shapiro, "The Triple Helix Paradigm in Korea: A Test for New Forms of Capital," *International Journal of Technology Management and Sustainable Development* 6, no. 3 (2007): 175; and David Edgington, "The Japanese Innovation System: University-Industry Linkages, Small Firms, and Regional Technology Clusters," *Prometheus* 26, no. 1 (2008): 12. The MEP provides a particularly revealing case of cross-national learning, for the National Institute of Standards and Technology (NIST) program is in part modeled on Japan's *kohsetsushi* industrial extension service, which was itself modeled on American agricultural extension earlier in the twentieth century. See Daniel Burton, "High Tech Competitiveness," *Foreign Policy* 92 (autumn 2008): 117–32.
120. Block, "Swimming against the Current," 199.
121. Ibid. See also Etzkowitz, "The New Visible Hand"; and Fong, "State Strength, Industry Structure, and Industrial Policy."
122. Johnson, *The Industrial Policy Debate*; and Zukin, *Industrial Policy*.
123. Zysman and Tyson, "American Industry in International Competition," 42.
124. Michael Crow and Barry Bozeman, *Limited by Design: R and D Laboratories in the US National Innovation System* (New York: Columbia University Press, 1998); and Graham, *Losing Time*.
125. Zysman and Tyson, "American Industry in International Competition," 42.
126. Powell, "Neither Market nor Hierarchy," 295.
127. Ibid., 303.
128. Ibid., 298.
129. Greta Krippner, "The Elusive Market: Embeddedness and the Paradigm of Economic Sociology," *Theory and Society* 30 (2001): 786.
130. Brian Riedl, "The Advanced Technology Program: Time to End This Corporate Welfare Handout," Heritage Foundation Backgrounder #1665 (Washington, DC: Heritage Foundation, 2003).
131. Feldman and Kelley, "Leveraging Research and Development." See also Todd Watkins, "Comments," *Assessing the ATP Assessment Program: Challenges and Opportunities*, ed. Charles Wessner (Washington, DC: National Academy Press, 2001). Take, for example, the ATP's HDTV partnership. "We would never have been able to work with the broadcast television networks and the other members of the partnership without the ATP," wrote one IBM official. "This kind of precompetitive enabling technology

development will not get done by private industry operating alone. The result is greater than the sum of its parts." See Kathleen Kingscott, "Lowering Hurdle Rates for New Technologies," in *The Advanced Technology Program: Assessing Outcomes*, ed. Charles Wessner (Washington, DC: National Academy Press, 2001), 115.

132. See, for example, Powell, "Neither Market nor Hierarchy"; and Malcolm Sawyer, "Reflections on the Nature and Role of Industrial Policy," *Metroecnomica* 43, no. 1/2 (1992): 51–73. Podolny and Page recognize that failure is understudied in analyses of network forms of organization in "Network Forms of Organization." And we have therefore developed a preliminary theory of network failure in Schrank and Whitford, "The Anatomy of Network Failure." Our point is less to defend our theory per se, however, than to make the more general case for the development and eventual testing of a theory of network failure capable of advancing the development of economic sociology and fueling a progressive political agenda.

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