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**LEARNING BY MONITORING:
THE INSTITUTIONS OF ECONOMIC DEVELOPMENT**

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Learning by Monitoring: The Institutions of Economic Development

1. The Conflict Between Learning and Monitoring

The central dilemma of growth is reconciling the demands of learning with the demands of monitoring. By economic learning I mean acquiring the knowledge to make and do the things valued in markets. This of course supposes unlearning knowledge that is not so valued. Thus developing economies must forsake subsistence survival strategies and master current know-how while adapting it to local conditions and changing world markets. Advanced economies must escape the routine mastery of the technical and organizational know-how of earlier epochs to master the principles of the current one. Put another way, learning at all levels of economic development is about waking up and catching up. By monitoring I mean simply the determination by the transacting parties that the gains from learning are distributed according to the standards agreed between them, as interpreted by each. The ability to monitor is thus the capacity of each party to assess whether it is getting enough of a fair deal to continue dealing.

The dilemma of economic development is that learning undermines the stability of relations normally required for monitoring. Take first the relations among firms. The more settled the definition of products and production processes, the easier it is for firms to write contracts covering the contingencies associated with their transactions. Similarly, when economies of scale and other considerations lead to the concentration of production in vertically integrated firms, stability allows operations to be steered through the formulation of bureaucratic rules that are intelligible to subordinates and enforceable by superiors. But learning is not learning unless it disrupts this regularity and thus gives rise to a potentially paralyzing fear of the breakdown of monitorability. For

two firms contemplating a project they can only realize together the fear is of possible hold ups. Each worries that if it dedicates resources to the common project first, the other will delay performing on its promise until the agreement between them is renegotiated in its favor; so neither acts for fear of being held up by its partner. The problem is not generally solved if one firm purchases the other and replaces contractual coordination with hierarchical order. For within a bureaucratic corporation, innovations threaten the principals' control of their subordinate agents. Instructions for the execution of novel projects are by definition so complex and ambiguous--tell me if we are trying to solve the right problem--that agents can interpret them as authority to pursue their own ends, not their supervisors'; and the redirection of effort may be undetectable to the higher ups.¹

A second, analogous conflict between the possibility of learning and the possibility of monitoring arises with regard to the relation between the economy as a whole and the state as the entity that sets the rules of economic transactions. The preponderance of historical evidence is that, regardless of their level of development, economies seldom pull themselves out of long-term, low-equilibrium traps by the bootstraps that market prices theoretically provide individual firms. Rather, unless the state reduces the risk of breaking with subsistence strategies or outdated practices by, say, sheltering domestic markets from foreign competition, facilitating the acquisition of new technology or subsidizing exports, the routines are the routine. But if the state seeks to advance the common good by sheltering markets in any of these ways, it may put the public interest at the mercy of private ones. Firms may use state protection of their markets as an occasion to acquire competitive know-how, and share the fruits of their knowledge fairly with workers, suppliers and others with whom they collaborate in production. But they may also enrich themselves without regard to their collaborators, or, worse still, use state protection to secure increased

revenues without learning at all. Addressing these problems through the application of broad, even-handed rules--equal treatment for all--increases the risk of wasting scarce resources to no effect; addressing them through programs tailored to particular situations opens the way to the pursuit of self-interest through the multiplication of exceptions and analogies. Nor does successful learning mean that firms will want to continue to succeed by learning. Success produces an inertia of its own; and as we in the advanced countries know as well as anyone, inert firms, regardless of their putative level of advancement, may find it more expedient to seek state protection than to (re)learn to compete.

Current debate offers two contrary but equally unsatisfactory solutions to these twin problems of economic coordination. Thus one solution to the problem of paralyzing fear of deceit among and within firms is often said to be simply a tradition or culture of trust. In such cultures, it is claimed, the fate of each is seen as so entwined with the others that no one would think of exploiting the opportunities created by innovation to hold up a partner or hoodwink a principal. This view reconciles learning and monitoring by asserting that learning is possible whenever monitoring is unnecessary. Because cultures are taken to be historical creations, and groups do not deliberately make their history, it is hard to see how persons who do not spontaneously trust one another can come to do so (Dore 1983).

The alternative, game-theoretic solution is more promising about the possibility of instigating cooperation, but only marginally so. The core claim of the game-theoretic view is that if the parties expect to gain from continuing exchange, put a high value on those future gains as against current takings, and know that their partners do the same, then trade will continue. Game theorists are ingenious in demonstrating the precise conditions which can lead to this outcome (Kreps 1990). But the same ingenuity reveals the fragility of such

contingent cooperation: The shadow of a doubt about a partner's intentions is often enough to move the parties in these accounts to forego the gains of trade rather than make themselves vulnerable to deceit. The game-theoretic view differs importantly from the cultural explanation in taking seriously the possibility that partners with no previous knowledge of each other can discover a propensity for long-term mutual reliance through initially limited trades. But in explaining cooperative behavior as the result of the coincidence of dispositions to cooperate, by a different route game theory too arrives at the conclusion that learning is possible only in the rare instances when the parties have clear motives for believing that monitoring takes care of itself.

Explanations of the state's successes and failures in encouraging learning without thwarting monitoring bring the subjacent fatalism of these views to light. Thus the public institution corresponding to the culture of trust is the "strong" state dominated by a bureaucratic elite so dedicated to the public good and autonomous that it can shelter the economy without becoming the captive of the interests it helps create (Johnson 1982). But nations are bequeathed strong states just as they are bequeathed cultures of trust; and there is, presumably, no more chance of creating such institutions than choosing one's ancestors. I take it as a sign of our times' skepticism about the possibilities of purposeful public action that there is, to my knowledge, no analog in the discussion of public intervention in the economy to the game-theoretic idea of the (fragile) stabilization of trade relations through trade (although it would, in principle, be possible to fashion one from the intellectual building blocks provided by pluralist theories of the state).

In this chapter, in contrast, I argue that the economic actors can often resolve the problem of reconciling learning and monitoring by making the two indistinguishable: by creating institutions that make discussion of what to do inextricable from discussion of what is being

done and the discussion of standards for apportioning gains and losses inextricable from apportionment. Through these institutions, discrete transactions among independent actors become continual, joint, formulations of common ends in which the participants' identities are reciprocally defining. Put yet another way, these institutions transform transactions into discussions, for discussion is precisely the process by which parties come to reinterpret themselves and their relation to each other by elaborating a common understanding of the world.

I claim further that discursive institutions of this kind can connect the state to the economy as well as actors to one another within the economy, and that by allowing the parties to know what they are getting into from the first, they can be built experimentally and incrementally. As the same principles undergird limited and extensive collaboration, wary partners can gauge their respective reliability and capacity without making themselves imprudently vulnerable or jeopardizing fuller cooperation through initial caution. But even as the partners define common goals and wariness gives way to a recognition of mutual dependence, their institutional obligations require them to continue scrutinizing one another's behavior. Thus by narrowing the gap between an agreement and its execution so much that game-theoretic concerns of defection and deceit can not enter debate, these restrictions also blur the distinction between mistrust and trust on which the cultural argument rests.

The empirical epicenter of the chapter is a discussion of the Japanese production system as defined by just-in-time inventory management, extensive use of subcontracting, statistical process controls and value-added engineering. Japan has grown so fast in the last century while maintaining the continuity of certain of its key economic institutions that it counts as the leading example of both a developing and an advanced economy. It is certainly the point of

reference in current discussion of trust or goodwill as a precondition of cooperation. Japanese success has also inspired a game-theoretic discussion, to which I will return below, of the coordination of decentralized industrial organizations in which all those collaborating in production are in effect joint owners of the assets under their control. Thus the Japanese system not only exemplifies the logic and developmental principles of the institutional reconciliation of learning and monitoring (Part 3), but also provides a convenient vantage point from which to make a first appraisal of the theoretical implications of that accomplishment (Part 4).

But Japanese experience is also a *locus classicus* for the discussion of the strong state as a necessary framework for growth at all levels of development and hence provides an equally convenient starting point for a reinterpretation of the conditions for successful state guidance of the economy. The argument is that success here has much more to do with joint formulation of goals as between suppliers and customers in collaborative subcontracting systems than the common picture of prescient bureaucratic direction of economic actors suggests. I will argue (Part 5) that such concertation of goals occurs in the relations between associations of many kinds and various state entities. We typically understand the purpose of such relations to be the harmonization of interests rooted in the division of labor. But in "developmental" states they serve rather to redefine the participants' interests in ways that reshape the division of labor within the economy and between it and the public authorities--and thus moots the kind of distinctions between state and civil society that the strong-state, weak-state debate takes as fundamental.

By way of conclusion I make explicit the assumptions about the relation between individual and society on which the notion of the discursive formation of interests rests, and show them to be a variant of what is often called social experimentalism or pragmatism. This view supposes that individuals are sociable in the sense that

they must cooperate to some extent to produce anything from meaning to goods. The claim is that the more deliberately the parties apply the general principles of cooperation to their particular activities, the more effective those activities will be. Learning by monitoring lends credence to this view with regard to just the sphere of activities commonly supposed to exclude sociability by its very nature: the economy (Part 6). To orient discussion at the beginning, however, I want to set these considerations in relation to the current reappraisal of the post-war debate about balanced versus unbalanced growth and economic development more generally.

2. Development Economics, Externalities and Social Learning

If you believe that good ideas may be eclipsed but never truly pass away, then the conditions for the current revival of interest in development economics could have been intuited from Hirschman's elegant but untimely obituary of development economics, written at the discipline's darkest hour a decade ago (Hirschman 1981). The success of development economics, Hirschman argued, had depended on the coincidence of two foundational convictions. The first was that the mechanisms of growth in (and hence the policy measures appropriate to) a growing, essentially self-equilibrating economy are different from those governing an economy trapped in a low-level equilibrium. The second was that international trade could help an economy free itself from such a low-equilibrium trap. Belief in the first conviction was buttressed by the experience of the Great Depression, especially as understood by Keynes, by Gerschenkron's analysis of the state's increasing role in pooling savings in successive cohorts of developing countries as economies of scale led to apparently inexorable increases in the efficient size of plant and hence the lumpiness of capital-goods investments, and Sir Arthur Lewis' analysis of the dilemmas of dual economies with unlimited reserves of costless agricultural labor (Gerschenkron 1962; Keynes [1936] 1980; Lewis 1954; 1955). The second conviction grew out of

the same understanding of free trade as a precondition of peaceful growth that made the Marshall Plan the U.S. strategy for reconstructing post-war Europe.

Development economics went into decline, Hirschman continued, as mainstream economists began to doubt the utility of distinguishing low-equilibrium traps as a fundamental type of economy, and Marxist economists, particularly in the developing countries, attacked the idea that international trade benefited the weaker trading partner. The mainstream doubts sprang from increasing skepticism about the effectiveness of Keynesian demand management in the advanced countries and their analogs (particularly market protection through import substitution strategies) in the developing world (Balassa 1971; Little and others 1970). This doubt was reinforced by the striking success of such apparently free-market economies as Taiwan, Hong-Kong, and South Korea. When the Marxists looked at their home economies they saw the multinationals and their domestic allies prospering amidst and from the general misery (Cardoso and Faletto 1979; Frank 1967; Frobel and others 1980).

Now the shoes are on different feet, or so down at the heel that no one wears them. The Marxists have lost confidence in autarkic strategies of development. Many now embrace free-market alternatives with the zeal of renegades; others are silenced by the prospect of a world of unappealing choices. But many of the most main stream economists now doubt that markets work to equalize growth rates in all economies. More to the point, they suspect that strength can breed strength and the strong can continue to grow faster than the weak.² Other mainstream economists and policy makers are now beginning to think that certain kinds of state sheltering of markets are a precondition, not an obstacle to successful international competition. This is the lesson they learn from Japanese economic strength in relation to U.S. weakness and the unexpected discovery of the role of the state--and the "strong" state

at that--in some of the export booms of the East Asian tigers.³ Suddenly almost every economy is in or could fall into a low-growth trap, no long-term logic of world-market equilibrium necessarily leads it out--but state intervention of the right kind just might.

This directs attention back to the classic problems of development economics as these were debated in the 1950s by proponents of balanced as against unbalanced growth. The common ground in the debate was the idea that firms pursuing growth strategies together faced different incentives and were more likely to succeed than firms in isolation. Imagine a closed economy composed of firms producing all the final and intermediate goods that under the most favorable conditions would be demanded in that economy. Then if all invest simultaneously, the investments of each, translated into wages, help create the purchasing power that backs demand for the products of all. These are pecuniary externalities. Similarly, if all the users of an intermediate product invest simultaneously, the producer of that good can invest in a larger-scale, and presumably more efficient plant than otherwise, to the benefit of all customers. These are non-pecuniary externalities.

The debate concerned the forms of coordination needed to produce these externalities. Proponents of balanced growth argued that externalities could only be achieved if the actors actually moved simultaneously, as the imaginary example of the closed economy just invoked suggests; and as a result they saw the principle problem of development policy as assuring that simultaneity (Fleming 1955; Nurkse 1984; Rosenstein-Rodan 1943). Proponents of unbalanced growth, notably Hirschman, countered that no developing economy could ever muster all the resources required for simultaneous action, and that the problem for policy makers was, therefore, how to stagger investments so that the disequilibria created between the supply and demand for various intermediate and final goods touched

off self-reinforcing sequences of up-stream and down-stream investments (Hirschman 1958; Streeten 1959).

The differing perspectives underlying the current concern with low-level traps have led to a revival of this debate that seems likely to extend it in new directions. For macroeconomists and specialists in international trade who acknowledge the danger of low-level traps and see the achievement of externalities as a precondition for escaping them, the central problem is how to model such externalities so that they are comprehensible in the light of mainstream ideas of market structure, and then to use these models as the authorization for policy makers to actually intervene to realize them. As the details of these eventual interventions appear of secondary importance, the model makers' sympathies are with the parsimonious arguments of the proponents of balanced growth, whose development strategy, after all, was simply to realize in real life the as-if assumptions of stories demonstrating the relevance of externalities.

On the other side are specialists in industrial organization and organizational sociology. They see in externalities as much the outcome as the motivating cause of many firm-level decisions, and they want to understand this relation from the vantage point of individual firms. They focus on the idea, central to the thesis of unbalanced growth, that the prospect of externalities is as important as the reality. Put another way, the actors can come to act in anticipation of complementary responses to separate decisions, so that in retrospect each in turn acted as though all had been deciding simultaneously. Their point of departure for this line of argument is Hirschman's claim that economic actors can be induced to learn to solve problems by the systematic creation of bottlenecks, and that this learning can become a self-sustaining source of growth as they discover how to recognize opportunities and how to profit from them. But in this form the unbalanced growth view is provocative, not

definitive. The claim that disequilibrium can induce "social learning" is hardly self-evident (Schon 1993). Shocks, after all, can also induce self-protective strategies of risk reduction through autarky. We need to know what kind of disruptions produce learning, and how.

It is in this connection that the experience of Japan and the broader debate on the reconciliation of learning and monitoring become relevant. As I want to show next, the Japanese production system has honed one variant of learning through the induction of disequilibria in manufacturing, and in a way that illuminates aspects of the general concept left underexposed in the older debate.

3. Unbalanced Growth in Production

Japanese production methods are often presented as either a collection of loosely related efficiency-enhancing techniques, or as emanations--uninteresting in themselves--of a national spirit of cooperation, horror of waste or improving zeal. In this section I want to show that the separate methods and the broad features of the industrial organizations they help define follow from application of a simple idea of decentralized learning that has been institutionalized so that the interests of the parts are consistent with the interests of the whole. For ease of exposition, I pass very lightly over the historical complexities of the system's origins and do no more than indicate its competitive shortcomings.

The constant reduction of in-process and finished goods inventory and the strain it puts on the whole manufacturing organization is the obvious point of contact between the Japanese production system and the idea of unbalanced growth. In the volatile markets of the early post-war years, many Japanese firms, and especially Toyota, came close to bankrupting themselves by accumulating inventory as they continued to produce at normal rates during downturns. When their bankers refused to bear this risk, the firms experimented with

inventoryless models of production. In part they were inspired by the restocking practices of U.S. supermarkets, which reordered goods only after the last item of a particular kind had been removed from the shelf. Toyota imagined itself as the shopper in a supermarket of automobile components, picking parts off the shelves in just the sequence needed to assemble a car for which it already had a customer. Removal of the parts would signal to those who made them and *their* components to produce a replacement, barring an order to produce nothing or a variant of the previous piece. The closer the assembler came to realizing this ideal, the closer it would be to eliminating the risk of holding inventory (Cusumano 1985).

Inventory is a reserve against contingencies. Production without inventory, therefore, places enormous demands on each manufacturing operation and the logistics system connecting them. Production must be synchronized so that the order for each piece is filled in time to be incorporated into more comprehensive assemblies. Quality must be impeccable because, by definition, defects can not be replaced with spares from inventory. Rather, the whole system must wait while an acceptable substitute is produced. Because breakdowns, like defects, delay production, operations must be extraordinarily reliable. They must also be extremely flexible, in the sense of quickly convertible from production of one make or model to another, if the system is to respond to variations in the composition of demand. This successive removal of inventories creates bottlenecks in production that allow the identification of each work station's weaknesses; and in this way it is analogous to the potentially informative disruptions of production caused by, say, the construction of a new steel plant in stories of unbalanced growth.

The Japanese system ensures that the information thus revealed is put to productive use first, by assigning responsibility for doing so to those--typically production workers--in the best position to learn what is required. Then assurances are provided that no one will be

harmed from what is learned, and that those adept at applying it will benefit from their efforts. Since the unbuffered operation of the machines at each work station creates a continuous flood of information about the station's performance, the machine operator was best situated to discover what did not work and what might: If stressing the system in its moment-to-moment operations produced the richest information about the causes of its limitations, those responsible for moment-to-moment operations had to bear responsibility for removing those causes.

Three other, closely related institutions moved the shop-floor workers to concert their interests in the use of this knowledge with those of the firm (Aoki 1988). The first is a guarantee of long-term employment security with pay tied to seniority for full-time workers. Although not established for this purpose, the guarantee of employment security meant that even workers who did not expect to make innovative use of what they observed had no motive for hoarding their knowledge from others. Whatever happened, they had a place in the company, and the better its fortunes, the better, thanks to the effects of seniority on wages, their own prospects. The second was a system of merit-based promotions administered through a central office--what Aoki calls the ranking hierarchy. This system assured that workers who did make innovative use of the information, or successfully encouraged whole groups to do so, were rewarded for their efforts and given the opportunity to extend and test their capacities. The third institution, the company union, assures that the others are working as agreed, although it, like lifetime employment, was certainly not created expressly for that purpose. Although I have introduced them matter-of-factly, and this introduction will do for now, their role in the organization of production raises fundamental questions about the de facto ownership of the firm which I will take up below.

Through the mid-1960s Japanese industry applied the general manufacturing disciplines immediately supposed by inventoryless operation.⁴ Single-minute-exchange-of-dies (SMED) and other tooling was widely introduced to reduce the set-up time required to switch from one part to another. Preventive maintenance was built more and more systematically into everyday operations to assure reliability. Insofar as it was easier to observe whether a particular manufacturing process was running within certain parameters, and there was a very high probability that parts produced under those conditions conformed to specifications, statistical process controls (SPCs) replaced direct monitoring of component quality. Cross-training of workers meant that production lines could be configured so that the operator at any one station could use different machines as required by different parts, or that operators could be moved from line to line to accommodate larger variations in demand. Just-in-time inventory systems that caused parts to be produced only as needed allowed firms to reap the benefits of each round of improvements and uncover the next set of bottlenecks to address by running the whole production system just faster than its least robust stations could manage.

The more groups of workers maintained, restocked, cut the set-up times and jointly operated clusters of machines, the more autonomous they became and the more they resembled a small factory-within-a-factory. Japanese firms began to formalize and extend this workshop autonomy through the introduction of quality circles. These circles, or the work teams that often grow out of them, group operators exercising joint control of a production area and encourage them to improve its performance as a unit in relation to the others. Quality circles and work teams thus invite production areas to do their own industrial engineering and organize their own logistics. At least, they must determine how much autonomy to assume in these regards, and how to cooperate with outsiders--technical staffs from the home company, or outside suppliers of parts

of equipment--in securing whatever services the group does not provide itself. Today it is not uncommon for such groups to negotiate with management about the fees they are charged, through the allocation of corporate overheads, for the use of plant facilities. They also frequently have a say in decisions regarding allocation of capital for their use, and in hiring and disciplining members. Taken together their prerogatives come to resemble those of independent business units.

The same set of concerns that culminated in the formation of quality circles and work teams also shaped and encouraged the extension of subcontracting by Japanese firms. In the late 1940s and early 1950s, Japanese companies turned to subcontracting to economize on direct investment outlays, undercut the influence of national unions, and create a production buffer that expanded and contracted in rhythm with the business cycle, thus sheltering the guaranteed jobs of the core work force from the effects of demand fluctuations. Beyond these immediate considerations, the Japanese producers, recall, saw themselves as customers in component supermarkets whose provisions they organized; and this self-conception may have worked in the background to encourage them to delegate responsibility for making even crucial parts to outside firms. More important, the same techniques of decentralizing responsibility for incremental, coordinated improvement through learning could easily be applied across firms. Indeed, as the evolution of the quality circles and work teams shows, the techniques actually foster the articulation of the whole production system into closely linked but increasingly autonomous units.

The evolution of pricing practices between subcontractors and their customers shows this connection between learning inside and learning outside the firm. Initially, subcontracting was by process: Turning, milling or boring jobs, for example, were simply transferred to outsiders who executed them on equipment similar to that

originally used and at a price controlled by the market rate for a process of that type. Prices for more complex jobs were calculated by summing the rates for their component steps.

Because the large Japanese manufacturers were reducing buffer inventories, adopting the corresponding manufacturing disciplines, and thus had to expect that parts suppliers could meet the new system's moving performance standards, the cost of switching subcontractors once a workable relation was established were high. Instead of putting each job out to bid at the end of each contract period, as a U.S. firm might have done, the Japanese companies therefore used the detailed cost information from the current agreement as the reference point for negotiations over target prices in the next one. Subcontractors were typically required to cut prices at the average rate expected of firms in their line of work after adjustments for fluctuations in the costs of raw materials, the subcontracting on which *they* relied, and tooling. Savings in excess of the targets were divided between the customer and the supplier according to fixed and generally accepted rules that rewarded superior performance.

This system of historically based price-determination could then be extended to accommodate the subcontractors' growing responsibilities in the inter-firm division of labor. For reasons connected to the logic of reorganization traced above but not of interest here, the large firms began to abandon the principles of grouping production machinery according to type--all the lathes in one workshop, all the milling machines in another--and started to line them up in the sequence required to produce particular families of parts--first a lathe, then a milling machine, then a lathe, and so on. Accordingly, the firms began to subcontract whole production sequences rather than jobs defined by particular processes, and the subcontractors had to assume both the administrative burden of managing the line as a whole and the responsibility for designing or

collaborating in the design of the components to be produced. Expenses for the new tasks were charged to the gross margins category (overhead, including labor, plus a profit margin); and firms thus had incentives to broaden their competence as well as increase their efficiency of current operations.

The effect of the elaboration and extension of the price rules and related practices was to create a relation between subcontractor and large-firm customer strictly analogous to the one between the large firm and the machine operator or work group of operators. The presumption that agreements with subcontractors will be extended through renegotiation, assuming acceptable performance, is equivalent to the operators' employment security. The pricing rules, in combination with the presumption that the most capable firms will increase their responsibilities and autonomy most rapidly, create an equivalent to the ranking hierarchy that encourages superior performance by rewarding it.

To illuminate the Japanese system from a final perspective I want to call attention to a characteristic vulnerability. The system works because the participants are induced to better their performance by constantly redefining themselves how that is to be done. The price of this autonomy, however, is agreement at the start that improvements will only count as improvements if they better some historical standard: Subcontractors must, for example, cut their production costs by an agreed amount semiannually, where the initial price is simply the prevailing one at the time the rules are first applied. If the target rate of improvement is better than the average rate of improvement in the industry, and the actual rate is close to the target, then the actors better the market while maintaining the freedom to do things by their own lights. Japanese company accounting systems, therefore, characteristically focus on measuring improvement in the output per unit of labor or capital input, rather than on assessing global performance retrospectively

by return on capital or other financial measures, as is common in Western firms.

The danger is that changed market conditions, and especially some innovation in process or product, so alter prevailing performance criteria that the original reference point becomes irrelevant. Improving at better than the industry rate is plainly no help when a breakthrough design doubles the competitive performance level or rate of improvement. The precondition of piecemeal improvement, we saw, is to define the performance of each part by reference to its effect on the performance of the whole, and then to forget about the whole and worry about the parts. The chances of overlooking opportunities or evidence of global breakthroughs are therefore particularly high for organizations that are especially proficient at piecemeal advance.⁵ Even changes intermediate in scope between the local and the global are likely to be suspect because they unsettle so many pieces at once that they potentially jeopardize the system of piecemeal learning by doing.

Just how much the Japanese economy actually suffers from these potential hazards is hard to say. But there is significant evidence from the computer and other industries that at the end of the 1980s Japanese firms were so absorbed by beating their own performance standards that they got better and better at a losing game.⁶ Improving faster than IBM on what IBM was doing when it dominated its industry is plainly no longer a world-beating strategy when IBM is no longer dominant. Similarly, Japanese machine-tool makers got better and better at linking their own products into more and more flexible ensembles with proprietary communications protocols. But their customers increasingly doubt that any one firm can produce the key building blocks of a flexible manufacturing system; hence they increasingly prefer open or non-proprietary protocols that allow combination of equipment from different makers. One result of such missteps is the Japanese firms' growing

interest in "Western" measurement standards that force production groups to justify their current projects as the most reasonable use of the resources they immobilize, given plausible alternative investments, rather than by reference to their own historical performance. Alternatively, Japanese firms might extend the system of inter-firm cooperation--described below--that is currently used to assess competing technical solutions to the same problem to permit assessment of the performance of whole products or business units using habitual accounting practices. Neither way is adjustment effortless or assured; and success in recasting the rules discussed so far will depend on the (re)constitutional powers of Japanese society as a whole: Whatever else it is, the particular system of firm-based learning by monitoring under discussion here is not an all-purpose machine for adjusting to all possible environments.

This much will suffice, I hope, to demonstrate that the large Japanese firm and its subcontractors are part of a single system of decentralized learning through induced shocks--unbalanced growth--and that the success of that system depends crucially on the way institutions shape the interests of the parties in production. Before extending the argument to the relation between the state and the economy as a whole, I want to stand aside and examine theoretically just what kind of shaping the institutions are doing.

4. What the Rules Rule Out: Some Implications of the Japanese Example

Schematic as it is, this account of the Japanese system is hard to reconcile with cultural or game-theoretic explanations of Japan's industrial success. On the one hand the thicket of rules prescribing the kind of activities to be monitored and the use to be made of the resulting information does not square with the idea that an historical propensity to cooperate assures cooperation. On the other hand, on

closer inspection, the rules seem designed more to rule out the kind of considerations of deceit and defection that preoccupies game theory than to regulate them to the end of cooperation.

Take first the anomalous character of the Japanese system as sketched here, from the culturalist perspective. If culturalist explanations of cooperation have any bite, then shared norms, and, above all, the shared expectation that all parties to an exchange share common interests must prevent any from exploiting the vulnerabilities of another. Explicit agreements of the bare-bones, we-agree-to-do-this variety are required even in such a world to assure that the partners are fully informed of their joint goal, and of their respective parts in achieving it. More extensive agreements enjoining the parties to treat each other fairly or share and share alike might also be consistent expressions of the notion of a culture of cooperation insofar as they--like civic festivals--affirm and thereby reinforce standards of behavior already recognized as binding.

Although it has often been noted that contracts between Japanese subcontractors and their customers do contain such declarations of mutual goodwill, the ensemble of Japanese production rules do not look at all like the I-will-be-good-to-you-if-you-are-good-to-me type (Kester 1991). They stipulate the kinds of information to be reviewed, set minimum performance standards with reference to that information, and say precisely how gains in excess of the minimum are to be divided (Nishiguchi 1993; Smitka 1991). If you didn't know better, in fact, you might easily mistake the Japanese rules for garden-variety contracts and hence as expressions of Western or U.S. cultures of mistrust.

Nor does it help the culturalist case to argue that, appearances aside, the Japanese interpret their rules with a trusting forbearance that transforms their significance and renders them more robust than

their Western counterparts. It is a staple of U.S. contract-law doctrine that all contracts are incomplete in the sense of leaving important contingencies uncovered; hence they must be interpreted with forbearance and deference to prevailing custom and practice if cooperation is to proceed. What distinguishes U.S. from Japanese agreements in the relevant cases is much more the substance of the rules they provide than the spirit in which those rules are interpreted. Until the culturalists can explain the extensive presence of rules in Japanese agreements and their content, the claim that the interpretive spirit of the agreement is decisive and its letter irrelevant strikes me as, well, spiritualist.

But in arguing that the Japanese rules are enough like contracts to discomfit the culturalist view I do not mean to be saying that the rules really amount to contracts in the game-theoretic sense of promises to perform contingent on the other parties' performance. On the contrary, the rules create a regime in which "agreements," "performance," and "monitoring" in the contractarian sense do not exist. In a contractual regime the parties are presumed to be independent entities exchanging promises to perform as agreed if the others keep their promises, too. Monitoring is the periodic review of performance to ascertain its conformity with the agreement. But if, as in the Japanese case, the agreed rules do not fix the parties' actions but rather define how they will act to revise their joint goals (and their standards for evaluating goals), then there can be no conventional monitoring. Because the behavior of one party can influence the goals of the others, it is meaningless for either to define, let alone measure, a partner's performance in reference to an anterior agreement.

Another way to put the point is to say that the unbalanced-growth rules transform what seems from a contractarian point of view like a chain of exchanges or an infinitely repeated game into a continuous discussion of joint possibilities and goals, where the parties' historical

relation defines their mutual expectations. Just as in a discussion, the parties suppose their understanding of their situation is limited. Therefore they jointly specify what they believe they understand so as to expose and begin exploring the limits of that understanding. Just as in a discussion they must accept the possibility that their views of themselves, of the world, and the interests arising from both--their identities, in short--will be changed unexpectedly by those explorations.

In a contractarian world, by contrast, there is no joint exploration of novelty and still less any redefinition of identities through persuasion. The world is presumed to be well understood. If an agent does not know what is the case in any particular situation, another likely will. Each party, moreover, has settled interests in the form of ranked preferences for particular outcomes and pursues them strategically. Speech in this world is just the strategy by which the speaker plays on the limits of the listener's knowledge to advance his or her own interests. In speaking, I try to characterize the world so that you will believe it is in your best interest to act in a way that serves my purposes. Since it is common knowledge that everyone uses talk strategically, listeners only credit what they hear if they believe speakers' preferences resemble their own, or unless claims are easily verified or lying effectively punished. The central problem in this world is therefore to determine when speech informatively discloses some known fact about the world, not how discussion might be used to extend the range of knowledge. No wonder, then, that the convention here is indeed to talk of talk rather than discussion or persuasion, as if to rule out the possibility that communication can influence fundamental beliefs and interests.⁷

Or consider, finally, the contrasting views of failure. In a discussion, the participants must accept the possibility that one party may simply be unable to keep up its end of the conversation, and that those who can will seek new interlocutors. One of the many possible

reasons for such failure is insufficient understanding of the problem at hand, or even how to pose it in the first place. The core idea of contingent-claims contracting and game theory, in contrast, is that agreements fail because of earthly, self-regarding motives, not haplessness in the face of higher powers. In these views, the very firmness of the parties' identities and interests and the clarity of their understanding of the world allow them to reliably advance their interests by undertaking certain actions in return for like undertakings by their partners. On this view, failure to perform is not the sign of inability, but rather of unwillingness rooted in an interest adverse to the original agreement.

Recasting our understanding of Japanese production against this backdrop makes it possible to address two problems that vex culturalist and game-theoretic interpretations. The first concerns evidence--surprising, given foreigners' expectations of steadfast dealings--of the wariness of Japanese business relations in general. Japanese subcontractors often take pains to avoid dependence on any single customer by diversifying sales across industries and among different *keiretsu* industrial groups (Friedman 1988; Nishiguchi 1993). Japanese firms also diversify their sources of credit to avoid dependence on any single bank insofar as possible. There is evidence, furthermore, that banks do let client firms fail at rates approximating those in the United States for comparable size-classes of business (Ramseyer 1991).

These findings do not fit the standard explanations. If the Japanese trust each other for cultural reasons, there should be no fear that dependence will be abused and hence no motive for reducing dependence through diversification. Indeed, in a trusting world, diversification would be a sign of disloyalty born of doubt in the partners' sense of responsibility. Every such self-protective gesture would create confusion where there had been none. In such a world,

bankers with a tutelary relation to firms would be failing to do their duty if they allowed those firms to fail.

Game theory points to a similarly refractory result. Firms in this view aim to make themselves vulnerable to one another in order to acquire, by cooperative forbearance, a reputation for trustworthiness. Such a reputation is competitively valuable, the argument goes, because potential partners will prefer dealing with a company or bank that cannot afford to lose its good name by deceit than with a firm that has no name to lose (De Long 1991).

Alternatively, think of the banks and large firms as insuring their borrowers and suppliers against the risk of failure. They collect premiums in the form of, respectively, above-market interest rates on loans and below-market prices for components. Firms would not want to diversify their customers for fear of diluting their insuring partners' sense of responsibility for their fate. Banks that let customers fail would be seen as insurers who collected premiums but refused to pay damages, with the result that payment of all premiums would stop (Ramseyer 1991). Hence banks would not let firms fail. Thus in game theory as in the cultural view small misdeeds can undo the whole world. Whereas in the cultural understanding these misdeeds are unthinkable, thinking about them in game theory makes them undoable.

The notion of rule-governed learning by monitoring can, in contrast, accommodate evidence of diversification and disruption of relations by shifting attention from the extent to the character of collaboration. As relations become discursive in the sense just described, firms can assess continuously through direct experience whether particular partners are able to advance a joint program or not, and whether, if they are, the result could be a fusion of identities that creates enduring mutual interests. Given the availability of this kind of knowledge about current and potential partners, strategies such as diversification and individual decisions such as the

willingness to allow a particular firm to fail need not have the generic and catastrophically disruptive significance attributed to them by the standard views. Diversification, for instance, might in the light of direct experience signify the intention to learn new things rather than fear of dependence mingled with a penchant for deceit. A bank might allow a customer to fail because that customer is indeed a failure. Other clients in different, more promising situations could correctly assume that the bank could tell the difference.

The second recalcitrant theme for the standard view concerns the question of property. The parties to production in the Japanese system take such obvious and extensive account of one another's concerns that it is awkward and misleading to consider them fully independent entities. If ownership means precisely the power to determine how assets will be used when those with a *de facto* say in their use disagree, who, given this reciprocal influence, owns a Japanese firm? Does the question have a meaning at all in a system of the Japanese kind?

The culturalist view tacitly evades the question by its assumption of general goodwill and forbearance. Where this assumption holds, ownership amounts to stewardship of particular goods that are ultimately regarded as common property. The identity of particular owners is irrelevant because ownership is automatically exercised in accordance with the public good. The property question *is* a question for game theory. If the actors' motives are insufficiently distinct it is pointless to theorize about the response of each to the autonomous strategic choices of the others. The precise distribution of rights and the evaluation of self-regarding intent is therefore of central interest; and the ambiguities of the Japanese system are perplexing.

An exemplary treatment of the problem from this perspective is Aoki's view of the Japanese firm as jointly owned by its employees

and an equity-owning bank, with management responsible for reconciling conflicts between them. Because ownership is joint and the owners share a common fate, each has reason to accommodate the interests of the other. Hence the reciprocal influence. Yet the owners' interests are distinct enough to provoke strategic maneuvering of the kind familiar in game theory. Hence the need for managerial mediation (Aoki 1990).

But this analysis does more to cast the explanatory difficulties of game theory into sharper relief than to resolve them. To begin with, it is clear from the preceding analysis that if direct employees are to be counted as owners, then subcontractors must be as well. Including them does more than lengthen the list of proprietors from two to three. Its significance, rather, is to call into question the very idea of treating the firm and its constituents as distinct entities, as opposed to mutually determining parts of a larger and indistinctly bounded pool of co-producers whose scope exceeds the mediating jurisdiction of any single group of managers.⁸ A closely related consideration applies to the equation of managers with arbitrators. In learning by monitoring employees perform such "managerial" tasks as reorganizing their own work in accordance with the generally recognized interests of the firm. Certainly their interests as a group can, at times, be distinguished from those of creditors or stockholders. But the notion of managers as arbiters confusingly reasserts a distinctness of purpose that the notion of joint ownership rightly, if imprecisely, blurs while correspondingly and implausibly narrowing the responsibilities of management. It seems no more reasonable to think of Japanese managers as mediators than to imagine the director of a Broadway show as simply arbitrating the demands of the cast, orchestra, stage crew, angles, composer and librettist.

These equivocations I take to be the result of the view's underlying assumptions, not the deficiencies of a particular formulation. The

same discursive rules that make it senseless to speak of conventional exchange also make it misleading, I take it, to speak of property in the conventional sense of residual control of assets as well. But what else would one expect of a production system in which the use of assets is determined incrementally by all those who use them?

In the following sections I want to extend the discussion to the state's relation to the economy, and show that the same principles that guide operation of systems of discursive production within and among firms also apply to building them deliberately within whole economies.

5. The State and Disequilibrium Learning

Debate about the state's role in promoting economic growth is, we saw, deadlocked. On the one hand it is clear that economies at all levels of development can fall into low-equilibrium traps from which they can be released only by external help, typically from the state. On the other hand, it is unclear how the state could acquire knowledge of the economy superior to the firms', and more obscure still how the state could avoid becoming the captive protector of the very economic groups whose transformation it aims to encourage. Indeed, these two concerns are connected in a particularly daunting way: In redirecting the economy, the state must rely on information not directly available to the market participants. Otherwise those participants could redirect themselves. But such extra-market information is politically tainted: Its generation and transmission depends on the participation of private groups as likely to use the chance to influence public authority to shelter themselves from competition as to use this occasion to improve their response to it. Under these circumstances nothing less than the *deus ex machina* of the strong state--a prescient bureaucracy independently moving the levers of government--is required to make public action a motor rather than an obstacle to growth.

I said before but let me say again that these fears are not groundless. Yet the notion of disequilibrium learning as central to economic development suggests that they overstate the obstacles to effective state intervention in the economy by mischaracterizing the kind of knowledge required to be effective and, relatedly, restricting unduly the kinds of relations that can exist between the state and private groups. In this section, therefore, I show how extensions of the disequilibrium-learning idea furnish alternatives to the standard understanding on these points; how these alternatives capture the workings of even "strong" developmental states better than the strong-state view itself; and how, finally, this counter-interpretation reveals similarities in a wide range of apparently disparate but successful efforts at economic promotion. Japan, as the archetype of the strong state, will serve as a central example, but, given the generality of the claims, I will draw on other cases as well.

Consider first the character of the knowledge relevant to state intervention. If the state can intervene successfully at all in the standard view, then only because its perch above or bestride the economy affords it a breadth of knowledge unavailable to market actors. The claim that this is possible today draws whatever plausibility it has from the related view, familiar from debates about finance capitalism, late development, and corporate governance, that banks with long-term equity holdings in firms to which they also extend credit are better corporate monitors than other stakeholders in part because of their broader experience of business activity in particular sectors and the economy as a whole.⁹

But if the central problem of economic growth is inducing disequilibrium learning, why shouldn't the state do or learn to do *that*, rather than worrying about how to increase the breath of its knowledge of the economy in general? There are two broad ways public authorities might attempt this; and despite their differences,

and their differential efficacy, neither requires the state to pretend to knowledge of markets superior to that of market participants.

The first potential way to induce disequilibrium learning is simply to perturb the existing equilibrium. This was, we saw, the idea behind the program of staggered investments as advanced by the proponents of unbalanced growth. Knowledge of upstream and downstream connections of various economic activities could guide authorities to the projects most likely to induce complementary investments (as in Hirschman's theory of linkages). But the state's aim was to trigger a self-reinforcing process that could proceed without further public intervention. As any of many possible projects could have this triggering effect, the evident limits to the state's knowledge of these connections were not considered an objection to the practicality of the strategy.

The difficulties with staggering large investments were anticipated a moment ago and are clear enough in the rear-view mirror of neo-classical criticism of development economics (Krueger 1974; Lal 1983; Little 1982). Projects big enough to create self-reinforcing disequilibria also afford sufficient opportunities for patronage quickly to breed lobbies of state employees as well as suppliers and customers of the public sector. These lobbies subordinate the development program to their own self interest. The result of economic disequilibrium is therefore not continuing, ever-more-productive disequilibrium, but rather a new balance of political forces that lives well by perpetuating the new status quo.

The second way to foster disequilibrium learning is to induce firms to agree to learn by monitoring. Instead of perturbing the marketplace in the expectation that firms will react by adopting rules encouraging disequilibrium learning, the state encourages firms to subject themselves to rules that create informative disequilibria in their operations. Thus the state aims at a relation with the firms that

is like the firms' relation to their employees or subcontractors, but with this difference: The goal of learning by monitoring within and among firms is primarily substantive--cheaper, more reliable, more innovative products; between the state and the firms, however, the goal is primarily formal--better rules for encouraging learning by monitoring.

The state need no more pretend to superior market knowledge in this variant of the strategy than were it acting directly in the marketplace. Rather, the state instigates the firms to set goals with reference to some prevailing standard so that shortfalls in performance are apparent to those with the incentives and capacity to remedy them--the firms themselves--and new targets are set accordingly. For its part, the state might undertake to stabilize certain markets by imposing import duties, offering export subsidies or authorizing firms in those markets to set prices and production quotas. In return those firms undertake to produce goods of export quality as defined in international commerce. Deviations from these standards orient the firms' broad efforts at improvement just as detection of defects in any one firm's production directs more localized improvements there. Analogously, the state might subsidize collaborative research efforts that grouped producers and users of a process or product with the pertinent research institutions. But the consortium would only get the subsidy provided it demonstrate the ability to evaluate and disseminate the results effectively. In these and other cases, discussion of which rules to apply can establish rules of participation--who is part of the group of potential cooperators and on what conditions--and create precedents that shape the procedures for rule revision.

Sometimes the state's interlocutor in such deliberations will be one or a few large companies, some or all of which may indeed be publicly owned. But much more often the public's interlocutors will be groups or associations of firms. In many developing countries the

firms in the traditional industries such as leather products, ceramics, textiles, and garments from which exports first come tend to be small and numerous. If the many firms in each industry agree to meet common standards, then each can learn from the shortcomings and accomplishments of the others (an incalculably valuable non-pecuniary externality), and the public authorities can economize on administrative resources that are likely in short supply. In the advanced economies the development and production of complex goods increasingly involves the coordination of many specialists from diverse branches of industry and the service sector with the consequence that here too the state is likely to treat groups of firms rather than individual concerns.

I will call such groupings developmental associations to distinguish them from more familiar types of affiliation.¹⁰ In standard accounts, we saw, associations are cast in two roles. In the neo-liberal view they are seen as predatory lobbies using political pressure to extract returns they cannot achieve directly in the market. In the neo-corporatist or private-interest government view they act more benignly to structure negotiations between interest groups and the state to reach mutually advantageous outcomes otherwise unattainable. Centralization of collective bargaining in deals between peak associations of labor and industry, for instance, reduces the inflationary danger of sequential, leapfrogging agreements when labor markets are tight, but also the threat of competitive deregulation resulting from a sequence of whip-sawing give-backs when they are slack. Similarly the state can authorize employers' associations and unions to shape and interpret regulatory rules provided the latter help police the regulations. The outcome can be rules that are enforceable because workable for all parties, and effective because enforceable. Benign or malign, these two types of association take the members' interests as essentially fixed. The bargaining regime changes the expression of those interests, not their fundamental character. Hence the characteristic tasks of officials of

these kinds of associations is reconciling or harmonizing the interests of the group's members with the interests of its external partners.¹¹

A central role of the developmental associations that emerge in strategies of disequilibrium learning, in contrast, is to help create the interests and identity of its members.¹² Discussions about the firms' goals and the procedures for revising them in the light of experience necessarily reach into the very constitution of each company, shaping what it wants by shaping what it supposes it can and will eventually be able to do. At the limit, in fact, the formative characteristics of association can dissuade this type of grouping from acting like a conventional interest group at all: If firms in association realize that they can thrive in market competition, they are unlikely to use their association to lobby for protection against the market. Thus, just as the state can learn how to set goals in collaboration with associated firms, the firms in association can learn how to organize and define themselves in collaboration with the state. This mutual vulnerability is the discursive counterpart in the relation between the state and the economy to the interpenetration of identities that follows from learning by monitoring within and among firms, and between them and their representative associations. I will speak, therefore, of developmental business associations when referring to the central institutional actor in this web of relations and of discursive interest formation when referring to the relations themselves.

I note, finally, that the partners' mutual vulnerability in a discursive relation does not imply enduring harmony in their dealings any more than the familiar harmonization of interests in a bargaining regime suggests that the attendant negotiations must inevitably result in mutually beneficial accord. Political groups that believe themselves to share a common end such as the good of the nation or the people, and that do actually put their own identities at risk in its pursuit, can nonetheless disagree so sharply in their interpretation of the common good that they become implacable enemies. Analogous

conflicts can arise among firms and between them and the state in the attempt to set the rules of disequilibrium learning.

Now down to cases, beginning with the claim that the success of the Japanese economy is due to the strength of the Japanese state. If the state can really discipline the economy as that argument supposes, then we ought to be investigating how bureaucracies come or can be made to be so resourceful, independent and public-minded, not how the authorities can instigate firms to set rules that transform their identity. And if any state is strong in this sense, then surely it is the Japanese one (Johnson 1982).¹³

But in the event the strong-state argument does not bear much weight even in Japan. Two kinds of objections are convincingly raised against it. The first is simply that the state's intentions have been an extremely unreliable guide to the economy's actual performance. In the post-war period, for example, the crucial guiding authority, the Ministry of Trade and Industry, systematically underestimated the expansive capacity of the domestic steel industry, tried to dissuade automobile firms from undertaking their hugely successful export drive, and urged rigorous consolidation on a machine-tool industry that succeeded brilliantly without it (Friedman 1988). Public authorities, understandably, are glad to claim credit for every economic success; but only the particularly credulous would accord it to them on this kind of coarse evidence.

The second objection is that wherever the Japanese state has intervened in the economy it has done so in collaboration with private-sector interlocutors; and it is this collaboration which explains why these interventions have on balance been beneficial, however inadequate they may appear as efforts to foster economic development by plan. As revealed in studies of the aluminum smelting, petroleum-refining, machine-tool and aircraft industries, the relation between the state and the economy is characterized by

what Samuels calls "reciprocal consent": The state acknowledges industry's right to extensive consultation in the formulation of policy, and industry in return acknowledges its obligation to cooperate in the execution of policies so formulated (Samuels 1987). Studies of Japanese economic development from the Meiji Restoration to the post-war period, we will see in a moment, confirm the pervasiveness of this pattern.

The notion of reciprocal consent casts too wide a net, however, for our purposes. On the one hand it includes forms of concertation between the state and business associations typical of neo-corporatist interest harmonization. On the other, it captures the collaboration between the state and developmental associations. To establish that the public authorities in Japan encouraged firms to learn by monitoring therefore, it is necessary to look past the debate about the strength of the Japanese state to accounts of the role of business associations in Japan.

What the historical record shows, in fact, is remarkably consistent and pervasive state support for developmental associations from the beginning of modern Japan in the aftermath of the Meiji Restoration. Between 1884 and 1900 a series of laws and edicts authorized a qualified majority of producers in the same line of business in the same locale to form local trade associations (*dogyo kumiai*) in such traditionally export-oriented industries as silk fabrics and reeling, cotton textiles and flannel, pottery, porcelain, and intricate matting. The trade associations could regulate prices, market shares, and wages for all firms in their respective industries and locales; they also adjudicated commercial disputes between producers in their jurisdiction. In those regards the *dogyo kumiai* were the successors to traditional guilds. Because the government was well aware, however, that such regulatory authority could be used to protect current practices, these powers were granted on condition that the associations police and improve the quality of the members'

products. This was typically accomplished through joint inspection of goods for export. High-quality producers would not want their reputations jeopardized by merchandising their wares with inferior goods; but they could presumably only sustain a coalition within the trade association in favor of above-average standards by showing the average performers in the association how to improve their production (Fujita 1988, pp. 88-98). There is no doubt that such cooperative inspection played an important role in structuring the relation between the state, the association and its members;¹⁴ and it is sometimes claimed that cooperative inspection was their main function (Miyajima 1988).

Similar principles, moreover, informed the operation of producers' organizations operating in the new, factory-based industries not covered by the regulations regarding local-trade association. The powerful All-Japan-Cotton Spinners' Association (*Boren*) for example, regulated competition in its industry during downturns by allocating its members quotas of raw cotton, whose import the association controlled. Members were under substantial public pressure to justify their quotas through superior or at least adequate performance in that a ranking of the firms according to efficiency in extracting output from their machines was published monthly in the *Boren* journal. Laggards consulted more technically advanced firms and members had the right to send their operators for training to associated firms or to request that trainers be sent to them (Otsuka and others 1988, pp. 87-88). The organized exchange of production information was also crucial to rationalization of highly concentrated industries such as steel, where the major firms before World War Two were either state owned (Yawata Seitetsujo) or state-founded (Tanaka Kozan, later Kamaisha Mining Company) and organized by the mid-1920s as a single cartel in which both public and private investments were at risk. Here it was the Iron and Steel Institute of Japan, founded during World War One, which collected and published technical information and discussed its application with engineers

from each firm in annual study meetings. The success of rationalization combined with expansion of the domestic market and depreciation of the yen to assure the industry high profit rates through the 1930s and thus to moot the question of how allocation of market shares would have been linked to performance in a contracting market (Okazaki 1991, pp. 177-187, esp. pp. 177-78 and 184).

Public authorities in this period, however, were determined to reaffirm the principle that regulatory authority would only be ceded to producers' associations if the latter could connect its exercise to the generation and dissemination of information that improved performance. Thus in 1930, the Ministry of Commerce and Industry--MITI's forerunner--formed a Temporary Rationalization Bureau to draft and supervise administration of new legislation covering local trade associations and like institutions. The aim of the Important Export Products Manufacturers' Association Law of 1931 was to help small and medium-sized manufacturers wrest control from brokers and wholesalers in the local trade associations dominated by the latter not least by ensuring that joint inspection resulted in a re-allocation of shares to superior performers (Fujita 1988, pp. 105-108; Miyajima 1988, pp. 113-114). The Rationalization Bureau's model of success was the Striped-Cloth Industry Association, which distributed a fixed quota of the industry's total annual target production among the new or current producers who bettered the current level of productivity (Fletcher 1989, pp. 92-95).

These principles continue to influence Japanese economic policy down to the present, although trade associations and cartels may not be as central to the diffusion of learning by monitoring as before World War Two. In some regional industries, for example, economic development is promoted by the joint efforts of local officials of MITI's Small Business Bureau and established local business people. Together they award subsidized credits to going firms and start-ups

that demonstrate the necessary technical expertise and familiarity with market prospects. The officials know the technology. The business people know the markets either because they sell to the same customers as the selected firms or else purchase the latter's products directly themselves. In the first case inadequate performance damages their reputation, in the second it directly threatens their own capacity to produce. Either way the business people have an immediate stake in the success of the firms they help select for aid; and the process by which credit is awarded and loans monitored becomes part of the larger discussion of how to improve production in the regional industry (Friedman 1988, pp. 187-195).

A final case in point concerns the organization of state support for interfirm research. An increasing share of public subsidies for commercially relevant research goes to groups of firms typically organized as Engineering Research Associations or ERAs: non-profit entities formed to carry out a specific research project, funded in part by member firms and in part by the government, and equivalent in law to private trade associations. The first ERA was founded in 1961 in the automobile industry; like *Boren* and the Iron and Steel Institute it collected, generated, and publicized information in ways that allowed firms to improve performance while assessing it. In that first Association, 47 automotive parts firms, none with research capacity of its own, used equipment and personnel provided by a national engineering laboratory and their trade association to collect data and perform tests connected with projects in the improvement of filters, radiators, suspensions and other components. Because the performance was measured centrally, superior designs were available to all; and once any component maker adopted it, the large-firm customers of the others would ensure, via the subcontracting rules, that all the others did so, too. As more and more firms have built research facilities of their own and ERAs have shifted from mastering and refining foreign best-practice to assessing the strengths and weaknesses of fundamentally different

technical approaches to a single problem, the internal structure of the associations has become more complex. Members must, for example, agree on a common standard for evaluating alternative solutions and ensure that assessment even at different locations is by uniform, agreed procedures (Levy and Samuels 1989, esp. pp. 30-37 and 58-73). Winning results have to be made accessible in industrially applicable forms to those who pursued losing alternatives. Under these conditions, government-supported laboratories--national ones for large projects, regional ones for smaller programs--act as translators and arbiters. They evaluate the research findings of participants and in so doing help articulate a lingua franca for expressing goals, techniques for measuring progress, and protocols for conveying results acceptable, and therefore reassuring, to all (Hane 1992).

In reviewing the role of developmental associations in Japanese economic policy I do not mean to be suggesting that those are the only kinds of business associations there are in Japan and still less that the national economic policy has had building them as its sole goal. There are lobbies and private interest governments aplenty in Japan and economic policy, particularly state support for the exclusion of foreign firms and products, seems to reflect concerns for national prowess that have more to do with geo-political concerns than the desire to increase the learning capacity of the economy, however difficult it may be to distinguish these ends. Nonetheless, by this cursory review I do, on the contrary, mean to advance the claim that learning by monitoring is as central an organizing principle in the relation between Japanese firms and the state as it is in the relations within and among firms, and that no other principle -- the bureaucratic ghost in the machinery of the strong state least of all -- does as well at explaining the economic success of these relations.

Nor, of course, is the focus on Japan meant to suggest that developmental associationalism is a peculiarly Japanese phenomenon. Even a glance at economic history reveals significant, strikingly similar cases in diverse cohorts of industrializing countries. For much of this century, trade associations in Germany, for example, have divided their respective industries into highly specialized subunits with firms in effect obligated to compete with others in their area of specialization. To expand their markets in this system therefore, firms have to increase demand for their type of product by improving its performance. The assurance that potential competitors in adjacent specializations can not enter the market during downturns reduces the risk of competing through increasing refinement of a single type of product. Boundaries between specializations are policed by a technical-norm committee (*Normenausschuss*) under the aegis of the trade association; and in the very process of setting norms, these committees, like the Japanese analogs, allow firms to learn crucial aspects of what the others know while monitoring their behavior (Herrigel 1989). German interfirm research, to continue the comparison, has developed in ways that recall the Japanese pattern. In the early post-World War Two period, firms with scant research facilities relied on the help of public institutions such as polytechnics to help in the solution of common technical problems. Today the role of such institutions is increasingly to evaluate competing solutions developed by the various firms' own labs within the setting of programs that look much like ERAs (Häusler and others 1993; Lütz 1992).

The economic success of South Korea and Taiwan can be interpreted as examples of the importance of developmental associations in the late-late cohort of industrializers. Debates about the preconditions of growth in these countries are following the pattern of changing analyses of Japan, with an important difference. During most of the 1980s these two Asian tigers were juxtaposed as examples of dynamic, deregulated market economies to the stalled model of

import substitution typical of Latin America. Closer analysis, however, revealed the guiding hand of "strong" states that, in Japanese fashion, allocated credit to favored industries and firms while stabilizing their markets through complex import controls and export subsidies (Amsden 1989; Wade 1990). But here, too, further examination of the origins and operations of this state guidance is bringing to light forms of cooperation between the state and organized business in which the latter adopts a learning regime in return for forms of market stabilization that only the former can assure.¹⁵

In both countries this cooperation was the result of bargains struck between the business community and state bureaucrats as both sought an alternative to the rampant clientelism that checked economic development in the 1950s. In Taiwan these bargains reinforced sectoral trade organizations that encouraged, measured, and rewarded learning by member firms as in the Japanese developmental associations--on which the Taiwanese institutions were partly modeled. In the face of a price war in the small domestic market and increasing international competition, for example, the Taiwan Cotton Spinners Association established an Export Encouragement Fund. Members were assessed for contributions to the fund in proportion to their cotton purchases. Producers that exported more than their assigned quota received their contribution back plus a bonus equivalent to five percent of export sales; those who exported less forfeited their contributions. The agreement was policed by an arbitration committee which could, as a last resort, call on the state to sanction violators by cutting off their electricity (Kuo 1990, pp. 99-122). In South Korea the military governments of the 1960s and 70s allowed the *chaebol* business groups that had established themselves in consumer-goods industries to diversify into the producer goods sectors, but on the condition that the conglomerates compel their subsidiaries to test their learning capacity in export markets.¹⁶

The danger of such comparisons is that they invite a counter interpretation of the illustrations of an allegedly general phenomenon as the expressions of a particular, historically defined type of economic development. Here, for example, the association of Germany and Japan as examples of learning by monitoring can be used to buttress an alternative argument about the particular characteristics of late-nineteenth century industrializers with strong traditions of guild production. Taiwan and Korea were once Japanese colonies. Hence it can always be argued that insofar as they are like Japan it is because, having once been part of that country, Japanese institutions continue to influence their development either as a colonial heritage or a model for emulation. The more superficially similar the comparative cases, the more likely it is that they *do* have comparable histories, and the effort to document the general applicability of a general principle becomes an argument for its historical specificity. To put an obstacle in the path of such an interpretation and to bolster the claim to generality in a way that connects it to the core concerns of development economics that inspire the argument as a whole, I present a final example of developmental associationalism that can not be assimilated to the Japanese historical context or, for that matter, export-oriented development models more generally, but does plainly reveal the connection between learning by monitoring within and among firms and developmental associations.

The case is the growth of furniture-making in the Brazilian village of São João do Aruaru from a fragmented, rudimentary handicraft to a technically adaptive, highly organized industry from the mid 1980s to the present (Amorim 1993). Under fiscal pressure from declining tax revenues and decreasing transfer payments from the federal government, the government of the state of Ceará in the Northeast of Brazil has tried to cut expenses and foster local development in this period by buying whatever supplies and equipment it could locally.

The State Industry and Commerce Secretariat (SIC), a small bureau of economic development specialists with a smaller agency of technical experts, has the responsibility for finding suppliers and brokering the transactions. But, crucially, the authority to make and accept purchases rests with the other government agencies that would actually use the products. Thus even given government preference for their products and in the absence of competition from imports, local firms do not have guaranteed markets. Consequently, the bureau has incentives to insure that the producers it finds can indeed meet the requirements of prospective customers.

This it does in the case of the furniture makers of São João do Aruaru by making all producers engaged to fill an order jointly responsible for filling it, making defects traceable to their source, and providing technical assistance to firms that need it. Thus contracts for the manufacture of, say, school desks or tables are signed between a particular government customer and the SIC acting as the agent for a group of producers. Half the total purchase is due upon the signing of the contract, and the remainder upon certification of its satisfactory completion. Metal tags on each product identify the maker. Under these circumstances, the above-average producers have even stronger incentives to share improving information with other firms in their group than their counterparts in Japanese-style developmental associations: If the laggards lag by too much in São João do Aruaru, the leaders, regardless of their reputation, do not get paid. Conversely, the laggards are under extreme pressure to improve their reputation for reliability. Otherwise their quota in the next round of contracting is sharply reduced, if they are allowed to participate at all. The SIC in turn has every reason to encourage and augment the flow of information about difficulties and remedies by putting its technical staffs at the service of the firms.

As the preceding discussion suggests, much of the coordination of relations among firms and between them and their customers on the

one hand and with the bureau on the other is actually the responsibility of trade associations. Indeed, the SIC makes formation of a trade association the precondition for contracting an order to a group of producers: A group that can not find agreeable rules of association presumably can not be expected to pool resources or reallocate responsibilities to meet difficulties as they arise. The association then assigns production quotas and uses the government technicians as consultants in addressing common problems; its composition and leadership change to reflect the growing influence of the more capable firms in successive contracts. Thus, although the system in São João do Aruaru does not expose producers to world-market competition, its upshot is to encourage firms and their developmental trade associations to acquire the skills that can eventually result in exports.

This variant of the developmental association, finally, reveals a connection between learning-by-monitoring within and among firms and learning-by-monitoring between the firms and the state that is less apparent in the Japanese case. From the perspective of the discussion of firm-level learning by monitoring, the SIC and the trade association to which it gave rise look like the purchasing department in a highly decentralized firm. Like a purchasing department, these entities match customers to suppliers in a way that induces learning: In exchange for the prospect of stable relations with their eventual customers, the producers--subcontractors in the one case, furniture makers in the other--have to demonstrate that they can meet the latter's changing demands. Like a purchasing department, the SIC and the trade association have to help organize the flows of information and assign responsibility for performance to serve this end. Seen this way, learning by monitoring in firms and learning by monitoring between the firms and the state are not only informed by the same principles: They can issue in convergent institutions.

6. Making and Understanding

The great appeal of Hirschman's idea of unbalanced growth was to suggest how public authorities might be vital in economic development without presuming to know more than the economic agents about how to do business. Only a theory that allows for the possibility of such benign public intervention can account for the frequency of vast pecuniary and non-pecuniary externalities that otherwise seem to require extraordinary good fortune, superhuman powers of coordination, or blind faith in the benevolent guidance of a hiding hand when viewed in retrospect. The idea of learning by monitoring tries to make good on the promise of such a theory by showing, from the smallest to the largest setting within an economy, how in transforming exchanges into continuous discussions the actors can induce learning by perturbing the status quo, yet not make themselves hostage to fortune.

In advancing these claims I have helped myself to assumptions about the capacities of individuals in relation to society that are at odds with the contrary standard views of both economists and sociologists. If the arguments carry weight, then they count as presumptive evidence in favor of these assumptions and reinforce the suspicion, hinted at repeatedly above, that current debates about the nature of the economy presume such essential features in common that for our purposes they amount to a false dichotomy more than fundamental alternatives.

By way of conclusion, then, I make the background assumptions of learning by monitoring explicit. The argument is that this form of economic cooperation is a particular case of a broader type of social experimentalism or pragmatism. In this view cooperation is as necessary to the production of meaning in science or politics as to the production of goods in the economy. With this mutual dependence goes mutual vulnerability; and hence in all spheres of life the actors must in some measure define their identities and interests in

creating a common framework of understanding that allows them to assess the shortcomings of their joint activities. The power of the theory is to show that the more aware they are of this necessity, the more they can make of their possibilities.

The crucible of modern debates about the character of economic exchange is the dispute between Spencer and Durkheim regarding the limits of contractual arrangements (Durkheim [1893] 1984). Spencer argued that all economic relations could be regulated by contracts. Durkheim objected that contracts can not cover all contingencies, and must therefore be interpreted when applied to unforeseen circumstances. In Durkheim's argument the parties, anticipating this, bind themselves only if they can also anticipate that eventual adjudication by third parties will be consistent with their own understanding of fairness. Hence the contractual regime supposes norms of fairness. Society in its formative stages is understood as the collective actor that articulates these norms and imposes them on individuals in rendering the world intelligible to all and each to the others. As the division of labor progresses, professional groups form with distinct responsibilities for the specialized tasks. A sense of mutual dependence obligates each group to the others and guides their members in the fulfillment of their contractual duties (Durkheim [1950] 1992). Thus even as the economy advances it continues to depend on society as its regulatory foundation.

Spencer's views, of course, eventuate in modern contractarian and game-theoretic understandings of the self-regarding basis of cooperation; Durkheim's shape two leading variants of economic sociology. The first, with which we are already familiar, makes cooperation depend on the presence of community and trust among the actors. Here Durkheimian norms of fairness have direct motivational force, causing the parties to anticipate reciprocity, not

guile from the partners, and so making cooperation natural whenever it is potentially advantageous.

The second variant focuses on social networks taken as connections among actors that result from trust in action. General norms are stripped of their motivational force in these networks. Rather the rhythmic accumulation and discharge of small obligations creates routines that shape in turn expectations of cooperation. Differences in these expectations define social networks of different types; and only certain types of networks encourage innovative exchange. In "undersocialized" networks (Granovetter 1985) the participants share so few expectations that they are paralyzed by their inability to foresee how others will react to unforeseen contingencies, as in markets. In "oversocialized" networks the rules of reciprocity are so precise and pervasive that they freeze exchange by defining the distribution of its proceeds. If wealth above a certain minimum is shared with one's kin, for example, accumulation above that limit is discouraged. Economic cooperation results in innovation and growth, therefore, only when networks are neither under- nor over-socialized.

Hence the false dichotomy between economic and sociological views of cooperation that served as the foil for discussion of learning by monitoring. Despite their differences, the heirs of Spencer and Durkheim both assume that cooperation is the result of anterior conditions: the alignment of the actors' self-interests in the one case and the normative characteristics of a group or habits of reciprocity in the other. Because they view cooperation as an outcome neither is much concerned with the way cooperation actually works; still less do they contemplate the specific possibility that the inner workings of cooperation might transform the actors' understanding of one another in relation to the commonly defined world in which their interests are rooted.

Yet the thicket of rules in the Japanese production system belies the idea that the parties expect to resolve eventual disputes by relying either on self-evident social norms or self-enforcing penalties and incentives that induce cooperation apart from any understanding of the others. What the rules of learning by monitoring do, recall, is oblige the parties to redefine their projects and obligations as their joint experience outpaces their initial understanding. It is this constant re-elaboration of intent that can produce the fundamental alignment of interests that the sociological account assumes as the precondition of cooperation and the economic account excludes even as a consequence. To understand the world in which this outcome makes sense, we have to distinguish the view of the relation between individual and group in learning by monitoring from the conceptual legacy of Spencer and Durkheim.

In learning by monitoring, individuals are, to begin with, sociable. As in the sociological view, what they want and what they regard as a legitimate means to getting it is powerfully shaped by what the groups into which they are born and raised indicate as desirable and legitimate in taking their world for granted. But in contrast to the sociological view, in the world of learning by monitoring this moral guidance is neither precise nor persuasive enough to determine action. Individuals must interpret the general rules and expectations to bring them to bear on their actual situation. These reinterpretations proceed through argumentative encounters in which the individual attempts to establish an equilibrium between his or her views and social standards by recasting both.¹⁷ It is this reflexive capacity to embrace different forms of self expression that define persons as individuals and create new interpretative possibilities for society.¹⁸

Such notions of reflexive sociability are in turn at the core of current debates about meaning and conviction that grow out of or are influenced by pragmatic or other notions of social experimentalism.

Modern analytic philosophy, to take the canonical example, holds language in use to be so irreducibly ambiguous that meaning can only be produced cooperatively, through joint elaboration of a common framework of understanding in discursive conversation. Such are the linguistic ambiguities analytic philosophy reveals that I must interpret what you say to make sense of it at all. To manage that I must assume as a rule that you are truthfully and conscientiously advancing some part of a general understanding of the world, and that I can grasp what you are saying. Put another way, I must assume that you are speaking a language, and one that I can translate sufficiently well into my own so that we can clarify your meaning by further exchanges.

This turns the contractarian view of talk on its head. The contractarians assume that meaning is self-evident, but that the interests of speakers and listeners are so likely to diverge that determining the credibility of utterances is the central problem of understanding. For the analytic philosophers, meaning is so tenuous that discussion partners must provisionally presume convergence of interests to make sense of what they are saying. If I assume guile, incoherence, or intranslatability, I can not hold the conversation steady enough to venture even a preliminary, clarificatory interpretation of what you might be saying. It makes no difference whether your language is with respect to mine that of another planet, another nation, another party, another intellectual school, or whether we merely use different dialects of a common tongue. In all cases our very ability to speak at all depends on a background disposition jointly to assume and explore a common framework of agreement potentially encompassing both languages: And this framework, in making meaning possible, also creates the conditions for addressing eventual differences as well (Davidson 1985; 1986).

The idea that corrigible consensus is crucial to our ability to specify disagreements and recompose them in a new, equally corrigible form

is also central to debates both about persuasion in scientific controversy and the nature of constitutionalism. Consider the account of science by Feyerabend, Lakatos, and Popper as a continuing exchange among dubious orthodoxies and redoubtable heterodoxies (Feyerabend 1970; Lakatos 1970; Popper 1970). They argue that orthodoxy and heterodoxy are much more closely related than Kuhn's depiction of science as alternating between periods of "normal" problem-solving and periods of "revolutionary" philosophizing suggests.¹⁹ If there were not always different schools of thought whose adherents picked and solved puzzles mindful of the differences, the scientific puzzle solver would be a drone. Good scientists, then, must learn to depend on ideas while assessing their dependability: Feyerabend, for example, speaks of a "principle of tenacity" by which scientists determine to maintain a belief *despite* indications of its infirmity (Feyerabend 1970). But such rules of tenacity can only work if they rest on an understanding, shared by all schools, of what in the end counts as good evidence and good argument in a particular area of inquiry. *That* understanding is the discipline in the scientific discipline, and simultaneously the ground for consensus and dissent.

In deliberative constitutionalism, finally, the actors are not individuals but social groups with persistently different interests and ideas of public order. These groups, it is presumed, recognize the need for long-term cooperation in pursuit of large common ends; but they recognize as well that such enduring, intimate relations both presuppose and contribute to changes in their identities without necessarily erasing their differences. Hence they devise an institution, particular to the particular historical circumstances, that encourages the parties to make themselves mutually vulnerable by limiting the dangers of mutual vulnerability. This institution is the constitution. It is the public, official equivalent of the background understanding of the conditions for elaborating agreement in the cooperative view of meaning; and it is corrigible through

amendment, just as the background understanding among particular parties becomes more clearly specified with time (Ackerman 1991; Michelman 1988).²⁰

These views plainly have deep affinities with the account of science as a continuous exchange among dubious orthodoxies and redoubtable heterodoxies. Like this notion of science, the idea of deliberative constitutionalism takes continuing differences of opinion as constitutive of a process of self-(re)definition, not an obstacle to it. Like the former, the latter calls attention to the difficulties of holding the world fixed enough in particular circumstances to assess which parts of it can be fruitfully questioned. Like this view of science, deliberative constitutionalism also assumes that answers regarding the questionable parts will eventually call into question the parts held fixed, but that these "crises" or "revolutions" will (usually) be manageable precisely because they are ultimately recognized as a heightened form of everyday deliberation or debate. Thus deliberative constitutionalism presumes that citizens have and can exercise in public debate the same cognitive faculties as the members of a disputatious scientific community.

But can this general view of the cooperative articulation of understanding be applied to cooperation in economic exchange? Habermas clearly objects to this extension in distinguishing communicative from strategic action. For Habermas, too, truthfulness and conscionability are the tacit preconditions of any conversation. In communicative action the interlocutors in effect make respect for these preconditions the goal of their joint effort: They speak to express their best understanding of how the world actually is or morally ought to be, and are therefore prepared to revise particular views given grounds to do so. Because they anticipate such challenges, what they say is potentially universalizable in its respect for the most general rules of warrantability. Science, morality, and foundations of law are the preserves of communicative action. In

strategic action, on the contrary, the interlocutors try to play on the presumptions required for intelligibility to achieve particular purposes. Talk becomes the cheap talk by which I try to enlist you for my ends. The economy is its precinct (Habermas 1984). The two realms of action are connected only through the law, which respects the individual's right to self expression and development as supposed in communicative action while providing the framework for the contractual pursuit of strategic ends (Habermas 1992a).

But this distinction of types of action is doubly suspect. First the notion of strategic action trivializes the problem of economic cooperation. If strategic action were so easily coordinated by contract as supposed, game theory would have a very easy road to hoe; and it would be impossible to understand the commonplace observation that the legal system increasingly relies on the normative consensus of actors in particular settings -- labor or securities markets, for example -- in place of general rules (Teubner 1992).

Second, the notion of communicative action suggests that the "universalizable" truths of science, morality, and law produced in discourse are so purified through conversation as to be (almost) beyond criticism. But the modern fascination with the cooperative generation of meaning was a response to the repeated failure to find in any of these realms a categorical language so unambiguous and robust as to remain fixed in the face of interpretation through application (Rorty 1979). The discovery of the compulsions to truthfulness and conscionability in everyday discussion helps clarify how persons in all circumstances make the meaningful best of a bad situation. It does not by itself warrant the conclusion that the dilemma of ambiguity can be overcome by those who take it especially to heart.²¹ In fact, it is a commonplace that the creation of a scientific "consensus" can have more to do with "economic sales strategies" than "any model of a unanimously concluded

conversation" (Knorr-Cetina and Amann 1992, p. 216). Habermas treats science as a counterexample to the view that cooperative truthfulness in collective problem-solving refashions previous understandings without purging them of particularity; on such evidence science is better seen as yet another confirmation of it.

Such, in any event, was the view of Dewey, Mead, and other American pragmatists whose work influenced the developments in analytic philosophy, the philosophy of science and constitutional law indicated here (Rorty 1986).²² They saw persons in all spheres of life as shaped in their wants and understandings by their current activities, yet able through reinterpretation of past experience to identify and collectively address in a limited way the limitations arising from those very activities. Science was one example of this capacity, democracy a second and ingenuity in production a third.²³ Dewey illustrated the position as sparsely as possible in defining the state in relation to the citizens. Just as "an alphabet *is* letters," he argued, "'society' is individuals in their connections with each other" (Dewey 1927, p. 69). Such sociable individuals can perceive through public debate the burdensome effects of their separate transactions, and jointly regulate their affairs accordingly. The group formed in identifying the collective-action problem is the public; its agents are the officials; together the officials are the state. The intended and unintended consequences of state action reshape private transactions, leading in time to a new problem of collective action and a new redress.

Learning by monitoring helps explain how pragmatic "publics" of this sort can function in the economy; pragmatism helps explain how the economic actors can learn to learn by monitoring. Take first learning by monitoring as pragmatism in economic action. From this perspective, the rules we have discussed are designed to oblige the actors to take notice of the unintended burdens created by their transactions and to arrive at a common view of how to reshape their

activities so as to avoid them. Learning by monitoring is in this sense an institutional device for turning, amidst the flux of economic life, the pragmatic trick of simultaneously defining a collective-action problem and a collective actor with a natural interest in addressing it. The disequilibria created by learning by monitoring are informatively effective for the same reasons as scientific experiments and democratic rule; and under these conditions the differences between the disciplines of the factory and laboratory dwindle in the face of their similarities.

Consider finally the preconditions of learning by monitoring itself. So far I have emphasized how scanty these need be: Because in this system the same rules apply to small cooperative projects as large and vigilant attention to the partners' activities is required under all circumstances, the costs of experimenting with learning by monitoring are theoretically so low that it is hard to see why it is not adopted wherever it might be useful. Yet we know how difficult it is for American or British firms to learn from the example of their Japanese competitors, although many succeed in the end (Nishiguchi 1993; Sako 1992). Is there anything to say about the conditions that make for success in some cases but not others?

Pragmatism suggests an answer that paradoxically encourages the actors to chance bootstrapping of this sort while casting doubt on the possibility of a predictive analysis of the grounds of success. For this kind of pragmatism the well springs of joint understanding and cooperation are found in the no man's land where action is more sociable than the economists' individual preference orderings and yet more personal, in the sense of related to the very nature of personhood, than the sociologists' norms and networks. In this zone it is impossible to predict what persons or groups will do by looking at their interests, values, or institutions because the limits of these can always become the starting point for their redefinition. Whether they do or not depends on the particulars of the situation, including,

of course, the actors' changing understandings of their possibilities given different interpretations of their past. Cooperation in this view therefore always has a history. But so long as the contingencies of the actors' reinterpretation of their experience in their self-constitution as a "public" are at the heart of this history, it can only be recounted in retrospect, not foretold.

This view helps make sense of the otherwise puzzling finding that no one has yet produced a plausible list of the preconditions for cooperative solutions to even the simplest collective-action problems: those concerning common-pool resources. In such cases resources are depleted unless their use is appropriately limited. Otherwise each user assumes the resource is wasting, gets as much as possible while the getting is good, and turns the assumption into a self-fulfilling prophecy. Thus, absent regulation, deep-sea fisheries will be destroyed by overfishing, alpine pastures by overgrazing.

But the connection between the formative social context of a common-pool resource problem and the institutionalization of a cooperative solution is quite weak (Ostrom 1990; 1991). Settled alpine communities that speak the same language and can not replace their resources if once they are destroyed are more likely to cooperate in managing their affairs than the polyglot fishing fleets from different nations that can move on to new fisheries if their destroy their current one. But the differences are marginal. There are plenty of unregulated meadows and well regulated fisheries. More fundamentally, investigation reveals important common-pool resource cases where users who once saw their interests as adverse redefine them as compatible in the act of institutionalizing cooperation, and equally important ones where cooperative solutions break down because of shortcomings in the institutions through which they operate. In this sense "community," taken as the historical alignment of interests of a group's members, is neither a necessary nor sufficient condition for cooperation: Cooperation can

arise from situations where interests were not aligned, and alignment by itself does not secure continuing cooperation (Ostrom 1992a; 1992b).

This is precisely the result that the preceding discussion suggests. The Pragmatic notion of self-reflective sociability lends explanatory plausibility to the finding that cooperation is possible wherever it is advantageous--where possible means, as it usually does, not impossible and not necessary. Learning by monitoring helps explain just how institutions of certain kinds can play a role in realizing those possibilities.

The upshot is that the most careful efforts to canvass the preconditions of cooperation put the responsibility for events precisely where learning by monitoring suggests it should lie: with those who see and bear the immediate consequences of their decisions. They can never know the outcome of their efforts at cooperation in advance. But the successes of learning by monitoring at all levels of economic development shows that in speaking of their possibilities they are exercising the very faculties needed for realizing them.

¹On contracts and hierarchies as alternative forms of economic governance see Williamson (1975; 1991). In these writings Williamson introduces a third, trust- or norm-based form of governance, the relational contract, as regulating exchanges where the parties rely on one another more directly than is consistent with standard contracting but not so much as, in his view, to justify coordination by hierarchy. For extended discussion and criticism of this category from the point of view developed in this chapter, see Sabel (1993, esp. pp. 70-80). On principal-agent problems see Grossman and Hart (1986) and Holmstrom and Milgrom (1990).

²Neoclassical views of competitive growth assume that factors of production--labor or stocks of physical capital--eventually have diminishing returns: For large stocks of capital, the greater the stock, the smaller the increase in output from an increment of capital. This suggests that the returns to investments would be greater in developing economies with small capital stocks than in advanced economies with large ones. Given perfect mobility of factors, the developing economies should attract investment, in time causing their growth rates to converge with those in the advanced ones. But apart from the well known Asian exceptions, most other poorer economies became even poorer.

As formulated by Romer and others (Helpman 1992; Lucas 1988; Romer 1986; 1989; 1990), the new growth theory accounts for this discrepancy by introducing knowledge in the form of, say, semiconductor designs or chemical processes as a type of capital with increasing returns. More precisely, knowledge is said to be a nonrival form of property. Nonrivalry means that the same knowledge can be used simultaneously at an unlimited number of sites, or, equivalently, that copies of the original are (for the owner) essentially free. This implies increasing returns. The price of the first turbine-blade factory includes design costs; the second uses exactly the same combination of labor, capital, and knowledge but costs less to build because the design can simply be reused. Doubling the inputs produces a disproportionately large increase in output--the reverse of the standard neoclassical case. Given such nonrival inputs, returns on investment need not decrease when the capital stock becomes large, nor will developing economies with small capital stocks automatically profit from the exhaustion of investment opportunities in the advanced economies.

But distinguishing knowledge as a type of input creates as much confusion as it resolves. In the new theory as in the old growth rates are associated with factor stocks; only the direction of the influence has, in an important case, changed. Yet why assume a direct relation between a stock of knowledge in the form of current plans and designs and future growth rates? Not the stock of knowledge but how it is used seems likely to shape how fast an economy grows, and how rapidly it can acquire new knowledge. Otherwise it is hard to explain how the Soviet-type economies could have fallen so far behind the advanced capitalist ones, how the U.S. could have fallen back as compared to Japan, or why certain developing countries have been able to absorb and refine technology so rapidly. The following chapter can be understood as an

effort to state some of the institutions that can make knowledge issue in growth. Naturally it would be possible to take the institutions of learning by monitoring, or some better specification of the mechanisms of growth and treat *them* as the relevant stock of inputs for assessing growth rates. But as will become clear in the body of the text, the notion of economic agency advanced here is so at odds with neo-classical assumptions that the result would be intractably syncretic.

³The new theory of international trade (Krugman 1990; 1991; Rivera-Batiz and Romer 1991), like the new growth theory, reaches novel results within the general neoclassical framework by assuming increasing returns to investments in certain kinds of knowledge. In the new trade theory the first firms to enter broad markets where mass production allows economies of scale or narrow markets where close relations between producers and users are a precondition for further development of the product can enjoy such increasing returns. These first movers enjoy potentially insuperable advantages over late comers. Protection in the new trade theory can therefore be used to allow domestic producers to learn how to cut costs sufficiently to compete on world markets with first movers.

⁴In the following characterization of Japanese production methods in general and subcontracting in its various stages of development I rely on Nishiguchi (1993), Ohno (1988), Smitka (1991), and Shingo (1989) as well as discussions with Bruce Hamilton, Vice President, Operations, United Electric Control, Watertown, MA, and David Nelson, Vice President, Purchasing, Honda of America Manufacturing, Inc., Marysville, OH.

⁵On the general problem of elaborating current designs while remaining attentive to alternatives, see Henderson and Clark (1990).

⁶The following draws on discussions with managers from Yamazaki Mazak and Mori-Seiki, both leading Japanese machine-tool firms, on June 8th and June 11th, 1992, respectively. I would like to thank Professor Hikari Nohara of the Faculty of Law, Hiroshima University, for making these discussions possible.

⁷A good overview of the rational-choice literature on talk is Austin-Smith (1992); for an effort to show that a society of individuals characterized as above may still be capable of something like political deliberation that is more attentive to the public good than mere log-rolling, see Krehbiel (1991).

⁸For an interesting discussion on these lines of the difficulties of applying standard ideas of property to Japanese firms see Fruin and Nishiguchi (1990) and Nishiguchi (1993); for a careful attempt to apply principal-agent categories to Japanese firms that forthrightly calls attention to the difficulties of doing so, see Miyazaki (1993).

⁹For early statements of the distinctive monitoring capacities of German financial capitalism, see Reisser (1906) and Hilferding ([1910] 1981); for a

discussion of the breakdown today of such systems of monitoring by bank owners, see Sabel, Griffin, and Deeg (1993).

¹⁰To avoid confusion at the risk of creating it: The term developmental association is like Johnson's term developmental state (Johnson 1982) in that it attributes potentially benign formative powers to an entity that in standard economic accounts can not have such. But the developmental state uses incentives to get firms to act as they would want to act if they knew what the central authorities know. Developmental associations, we will see, use incentives to get member firms to acquire the information they need to know how to act.

¹¹I am being a little unfair to the private-interest government argument--but only a little. Writers in this school, such as Schmitter and Streeck, have occasionally observed that the interests of associations and their members can be mutually defining (Streeck and Schmitter 1985, p. 9). But the concern with interest (inter)mediation typically overshadows concern for interest generation.

Consider in this connection Streeck's exchange with Offe and Wiesenthal regarding the character of trade-union as against business-association interests (Streeck 1990). Offe and Wiesenthal argue that neo-corporatist systems privilege the interests of firms over the interests of labor because business interests are intrinsically simpler and hence less costly to represent. Firms' interests, they claim, are reducible "to the unequivocal standards of expected costs and returns, i.e. to the measuring rod of money" (Offe and Wiesenthal 1980, p. 75, cited in Streeck, p. 9). So measured they are marching orders to the staffs of business associations. This they call "monological" interest formation. Workers, in contrast, have heterogeneous "life interests" rooted in their vicissitudes as subordinate actors in labor markets. Their interests "*can only be met to the extent they are partially redefined*" through political discourse between the workers and their trade-union representatives (Offe and Wiesenthal 1980). This is the "dialogical" formation of interests, and plainly related to the workings of developmental associations.

Streeck objects that firms and workers have joint interests in the regulation of labor markets, but firms have additional interests in the regulation of product markets. These additional interests, he argues, explain why there are typically more business associations than trade unions in any given sector of the economy, and not fewer, as the notion of self-evident firm interests might suggest. This takes the bite from Offe and Wiesenthal's variant of the claim that neo-corporatism is unfair to labor.

Shifting the focus from the distinction between "monological" and "dialogical" interest formation to the distinction between simple and complex interest representation, however, obscures the possibility that business interests are not just as complex as labor interests, but formed as "dialogically" as well. Yet precisely the discursive relation between firms and associations in the producers' "life world" is of concern here.

¹²For a thoughtful discussion of the formation of new social movements that pursues a similar tack, see Cohen (1985)

¹³A more sophisticated variant of the strong-state view argues that the Japanese state and firms simply learned the lesson of the new trade theory before their competitors, and acted in concert accordingly (Tyson and Zysman 1989). Insofar as concerted action in this view means protectionism subject to the principles of what I am calling learning by monitoring in developmental associations, the argument is plainly consistent with this one, subject to the reservation expressed above about the utility of conceiving of increasing returns as a feature of a stock of capital of a particular sort. Insofar as concerted action is taken to reflect knowledge of the economy available to the state but not firms, the argument fails for the same reasons its less theoretically inclined predecessor fails.

¹⁴See, for example, Fletcher's description of the functions of the Kobe Trade Association, formed in 1900, as illustrative of "how a successful group operated." The Association "inspected brushes for export, investigated opportunities for obtaining financial credit, and distributed information on overseas markets. The association fulfilled a parental role through mediating disputes and cautioning members about actions that could threaten credit ratings abroad for everyone" (Fletcher 1989).

¹⁵See generally on the current reappraisal of the role of associations of the sort discussed here in developing countries Doner (1991; 1992) and Evans (1992).

¹⁶On the *chaebol's* strong-arm insistence that the "strong" state allow them to orchestrate entry into heavy industry, see Choi (1987, esp. p. 133). Choi's focus is on the extensive inter-ministerial conflicts in Korean economic policy-making. But as each of the warring sections, departments and ministries was allied with client groups in the economy, his analysis suggests that despite its dictatorial powers the South Korean state was not autonomous in the sense strong states are alleged to be. On the conglomerates' internal strategies for reducing risk through diversification while capitalizing on their increasing ability to absorb and apply technology, see Amsden (1989). For evidence that trade associations played an important role alongside the *chaebol* in forming government policy, see Choi (1987, p. 215, fn. 22). I have not, however, found an account of what that role was.

¹⁷For orientation: Excellent criticism of classic social theory that arrive at this result are Bourdieu (1977) and Unger (1987). I take a different route because of the centrality of the idea of discussion to my argument; but the paths cross.

¹⁸For contrasting views of how such reflexive choices actually occur see Sen (1979) (the self as choosing among various preference orderings) and Minsky (1986) (the self as the result of exchanges among its constitutive faculties).

¹⁹Contrast this view with Kuhn's distinction between "normal" science dominated by "puzzle solvers" with no inkling of the radically different understandings of the world and "revolutions" dominated by "philosophers" absorbed to obsession by their own alternative to orthodoxy (Kuhn 1970).

²⁰Contrast this view with the idea of the constitution as a device for purifying particular interests into a general will (Rousseau [1772] 1984), and the idea of the constitution as a master contract setting general conditions under which all private agreements become self-interpreting (Hardin 1989).

²¹For a criticism of Habermas on these lines see Paul Ricoeur (1992, pp. 280-290); for an argument that the distinction between communicative and strategic action reflects a German intellectual tradition of seeing the truth as revealed in words not deeds, see Rainer Döbert (1992).

²²The pragmatists' influence on Habermas is ambiguous. He refers to Peirce in elaborating the notion of purified, "universalizable" truth, but to Mead in tracing language as the medium that allows creation of sociable selves. See on Peirce, Habermas (1992a, pp. 30-32), and on Mead, Habermas (1992b).

²³See, for example George Herbert Mead (1909; 1912).

References

- Ackerman, Bruce A. 1991. *We the People, Volume 1: Foundations*. Cambridge: Harvard University Press.
- Amorim, Monica Alves. 1993. "Lesson on Demand: Order and Progress for Small Firms in Ceará, Brazil." Masters Thesis, Massachusetts Institute of Technology, Department of Urban Studies and Planning.
- Amsden, Alice H. 1989. *Asia's Next Giant: South Korea and Late Industrialization*. New York: Oxford University Press.
- Aoki, Masahiko. 1988. *Information, Incentives, and Bargaining in the Japanese Economy*. Cambridge: Cambridge University Press.
- Aoki, Masahiko. 1990. "Toward an Economic Model of the Japanese Firm." *Journal of Economic Literature* 28: 1-27.
- Austin-Smith, David. 1992. "Strategic Models of Talk in Political Decision Making." *International Political Science Review* 13(1): 45-58.
- Balassa, Bela. 1971. "Trade Policies in Developing Countries." *American Economic Review, Papers and Proceedings* 61: 178-187.
- Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Translated by Richard Nice. Cambridge: Cambridge University Press.
- Cardoso, Fernando Henrique and Enzo Faletto. 1979. *Dependency and Development in Latin America*. Translated by Marjory Mattingly Uriguidi. Berkeley: University of California Press.
- Choi, Byung-Sun. 1987. "Institutionalizing a Liberal Economic Order in Korea: The Strategic Management of Economic Change." Ph.D, Harvard University.

Cohen, Jean L. 1985. "Strategy or Identity: New Theoretical Paradigms and Contemporary Social Movements." *Social Research* 52(4): 663-716.

Cusumano, Michael A. 1985. *The Japanese Automobile Industry: Technology and Management at Nissan and Toyota*. Cambridge, MA: Council on East Asian Studies, Harvard University.

Davidson, Donald. 1985. "On the Very Idea of a Conceptual Scheme." Pp. 5-20 in *Post-Analytic Philosophy*, edited by John Rajchman and Cornel West. New York: Columbia University Press.

Davidson, Donald. 1986. "A Coherence Theory of Truth and Knowledge." Pp. 307-319 in *Truth and Interpretation: Perspectives on the Philosophy of Donald Davidson*, edited by Ernest LePore. Oxford: Basil Blackwell.

De Long, J. Bradford. 1991. "Did J. P. Morgan's Men Add Value? An Economist's Perspective on Financial Capitalism." Pp. 205-236 in *Inside the Business Enterprise: Historical Perspectives on the Use of Information*, edited by Peter Temin. Chicago: University of Chicago Press.

Dewey, John. 1927. *The Public and its Problems*. New York: H. Holt.

Döbert, Rainer. 1992. "Konsentheorie als deutsche Ideologie." Pp. 276-309 in *Kommunikation und Konsens in modernen Gesellschaften*, edited by Hans Joachim Giegel. Frankfurt am Main: Suhrkamp.

Doner, Richard F. 1991. *Driving a Bargain: Automobile Industrialization and Japanese Firms in Southeast Asia*. Berkeley: University of California Press.

Doner, Richard F. 1992. "Limits of State Strength: Toward an Institutionalist View of Economic Development." *World Politics* 44(3): 398-431.

Dore, Ronald. 1983. "Goodwill and the Spirit of Market Capitalism." *The British Journal of Sociology* 34(4): 459-482.

- Durkheim, Emile. [1893] 1984. *The Division of Labor in Society*. Translated by W. D. Halls. New York: Free Press.
- Durkheim, Emile. [1950] 1992. *Professional Ethics and Civic Morals*. Translated by Cornelia Brookfield. New York: Routledge.
- Evans, Peter. 1992. "The State as Problem and Solution: Predation, Embedded Autonomy and Adjustment." Pp. 139-181 in *The Politics of Economic Adjustment: International Constraints, Distributive Politics, and the State*, edited by Stephan Haggard and Robert Kaufman. Princeton, NJ: Princeton University Press.
- Feyerabend, Paul. 1970. "Consolations for the Specialist." Pp. 197-230 in *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4*, edited by Imre Lakatos and Alan Musgrave. Cambridge: Cambridge University Press.
- Fleming, Marcus J. 1955. "External Economies and the Doctrine of Balanced Growth." *Economic Journal* 65: 241-256.
- Fletcher, William Miles. 1989. *The Japanese Business Community and National Trade Policy, 1920-1942*. Chapel Hill: University of North Carolina Press.
- Frank, Andre Gunder. 1967. *Capitalism and Underdevelopment in Latin America*. New York: Monthly Review Press.
- Friedman, David. 1988. *The Misunderstood Miracle: Industrial Development and Political Change in Japan*. Ithaca: Cornell University Press.
- Frobel, Folker, Jurgen Heinrichs, and Otto Kreye. 1980. *The New International Division of Labor*. Cambridge: Cambridge University Press.
- Fruin, W. Mark and Toshohiro Nishiguchi. 1990. "The Toyota Production System: Its Organizational Definition and Diffusion in Japan." Unpublished Manuscript

- Fujita, Teiichiro. 1988. "Local Trade Associations." Pp. 87-113 in *Trade Associations in Business History*, edited by Hiroaki Yamazaki and Matao Miyamoto. Tokyo: University of Tokyo Press.
- Gerschenkron, Alexander. 1962. *Economic Backwardness in Historical Perspective*. Cambridge: Harvard University Press.
- Granovetter, Mark. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91(3): 481-510.
- Grossman, Sanford and Oliver Hart. 1986. "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy* 94(4): 691-719.
- Habermas, Jürgen. 1984. "Erläuterungen zum Begriff des kommunikativen Handelns." Pp. 571-605 in *Vorstudien und Ergänzungen zur Theorie des kommunikativen Handelns*, edited by Jürgen Habermas. Frankfurt am Main: Suhrkamp Verlag.
- Habermas, Jürgen. 1992a. *Faktizität und Geltung: Beiträge zur Diskurstheorie des Rechts und des demokratischen Rechtsstaats*. Frankfurt: Suhrkamp.
- Habermas, Jürgen. 1992b. "Individuierung durch Vergesellschaftung. Zu G. H. Meads Theorie der Subjektivität." Pp. 187-242 in *Nachmetaphysisches Denken*, edited by Jürgen Habermas. Frankfurt am Main: Suhrkamp.
- Hane, Gerald Jiro. 1992. "Research and Development Consortia in Innovation in Japan." MIT Japan Program. Working Paper MITJP 92-07.
- Hardin, Russell. 1989. "Why a Constitution?" Pp. 100-120 in *The Federalist Papers and the New Institutionalism*, edited by Bernard Grofman and Donald Wittman. New York: Agathon Press.
- Häusler, Jürgen, Hans-Willy Hohn, and Susanne Lütz. 1993. "The Architecture of an R&D Collaboration." Pp. 211-250 in *Games in*

Hierarchies and Networks, edited by Fritz W. Scharpf. Boulder: Westview Press.

Helpman, Elhanan. 1992. "Endogenous Macroeconomic Growth Theory." *European Economic Review* 36: 237-67.

Henderson, Rebecca M. and Kim B. Clark. 1990. "Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms." *Administrative Science Quarterly* 35(1): 9-30.

Herrigel, Gary. 1989. "The Case of the West German Machine-Tool Industry." Pp. 185-220 in *Industry and Politics in West Germany: Toward the Third Republic*, edited by Peter Katzenstein. Ithaca, NY: Cornell University Press.

Hilferding, Rudolf. [1910] 1981. *Finance Capital: A Study of the Latest Phase of Capitalist Development*. Translated by Morris Watnick and Sam Gordon. Boston: Routledge & Kegan Paul.

Hirschman, Albert O. 1958. *The Strategy of Economic Development*. New Haven: Yale University Press.

Hirschman, Albert O. 1981. "The Rise and Decline of Development Economics." Pp. 1-24 in *Essays in Trespassing*, edited by Albert O. Hirschman. Cambridge: Cambridge University Press.

Holmstrom, Bengt and Paul Milgrom. 1990. "Multi-Task Principal-Agent Analyses." Yale School of Management. Unpublished Manuscript

Johnson, Chalmers A. 1982. *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*. Stanford: Stanford University Press.

Kester, Carl. 1991. "Governance, Contracting and Investment Time Horizon." Harvard Business School. Working Paper 92-003.

- Keynes, John Maynard. [1936] 1980. *The General Theory of Employment, Interest, and Money*. New York: Harcourt, Brace, and Jovanovich.
- Knorr-Cetina, Karin and Klaus Amann. 1992. "Konzensprozesse in der Wissenschaft." Pp. 212-235 in *Kommunikation und Konsens in modernen Gesellschaften*, edited by Hans Joachim Giegel. Frankfurt am Main: Suhrkamp.
- Krehbiel, Keith. 1991. *Information and Legislative Organization*. Ann Arbor: University of Michigan Press.
- Kreps, David M. 1990. "Corporate Culture and Economic Theory." Pp. 90-143 in *Perspectives on Positive Political Economy*, edited by James E. Alt and Kenneth A. Shepsle. Cambridge: Cambridge University Press.
- Krueger, Ann O. 1974. "The Political Economy of the Rent-Seeking Society." *American Economic Review* 64: 291-303.
- Krugman, Paul R. 1990. "Endogenous Innovation, International Trade and Growth." Pp. 165-182 in *Rethinking International Trade*, edited by idem. Cambridge, MA: MIT Press.
- Krugman, Paul R. 1991. *Geography and Trade*. Cambridge, MA: MIT Press.
- Kuhn, Thomas S. 1970. *The Structure of Scientific Revolutions*. 2nd ed., Chicago: University of Chicago Press.
- Kuo, Cheng-Tian. 1990. "Economic Regimes and National Performance in the World Economy: Taiwan and the Philippines, Volume One." Ph.D., The University of Chicago.
- Lakatos, Imre. 1970. "Falsification and the Methodology of Scientific Research Programmes." Pp. 91-196 in *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4*, edited by Imre Lakatos and Alan Musgrave. London: Cambridge University Press.

Lal, Deepak. 1983. *The Poverty of "Development Economics"*. London: Institute of Economic Affairs.

Levy, Jonah D. and Richard J. Samuels. 1989. "Institutions and Innovation: Research Collaboration as Technology Strategy in Japan." Massachusetts Institute of Technology, Department of Political Science. Working Paper MITJSTP 89-02.

Lewis, W. Arthur. 1954. "Economic Development with Unlimited Supplies of Labor." *Manchester School of Economic and Social Studies* 22(2): 139-191.

Lewis, W. Arthur. 1955. *The Theory of Economic Growth*. London: Allen and Unwin.

Little, Ian M. D. 1982. *Economic Development: Theory, Policy, and International Relations*. New York: Basic Books.

Little, Ian M. D., Tibor Scitovsky, and Maurice Scott. 1970. *Industry and Trade in Some Developing Countries: A Comparative Study*. New York: Oxford University Press.

Lucas, Robert E. 1988. "On the Mechanics of Development." *Journal of Monetary Economics* 22: 3-42.

Lütz, Susanne. 1992. "Die staatliche Steuerung von Kooperationen in der Industrieforschung: Funktionsweise und Erfolgsbedingungen des Förderinstrumentes Verbundforschung." Universität Gesamthochschule Duisburg.

Mead, George Herbert. 1909. "Industrial Education, the Working Man, and the School." *The Elementary School Teacher* 9: 369-383.

Mead, George Herbert, Ernest A. Wreidt, and William J. Bogan. 1912. *A Report on Vocational Training in Chicago and in Other Cities*. Chicago: City Club of Chicago.

Michelman, Frank. 1988. "Law's Republic." *Yale Law Journal* 97(8): 1493-1537.

- Minsky, Marvin. 1986. *The Society of Mind*. New York: Simon & Schuster.
- Miyajima, Hideaki. 1988. "Comment." Pp. 114-119 in *Trade Associations in Business History*, edited by Hiroaki Yamazaki and Matao Miyamoto. Tokyo: University of Tokyo Press.
- Miyazaki, Hajime. 1993. "Employeeism, Corporate Governance, and the J-Firm." *Journal of Comparative Economics* 17: 443-469.
- Nishiguchi, Toshihiro. 1993. *Strategic Industrial Sourcing: The Japanese Advantage*. New York: Oxford University Press.
- Nurkse, Ragnar. 1984. "The Conflict Between 'Balanced Growth' and International Specialization." Pp. 373-76 in *Leading Issues in Economic Development*, edited by Gerald M. Meier. 4th ed., Vol. Oxford: Oxford University Press.
- Offe, Claus and Helmut Wiesenthal. 1980. "Two Logics of Collective Action: Theoretical Notes on Social Class and Organizational Form." *Political Power and Social Theory* 1: 67-115.
- Ohno, Taiichi. 1988. *The Toyota Production System: Beyond Large-Scale Production*. Cambridge, MA: Productivity Press.
- Okazaki, Tetsuji. 1991. "Import Substitution and Competitiveness in the Prewar Japanese Iron and Steel Industry." Pp. 166-190 in *Changing Patterns of International Rivalry: Some Lessons from the Steel Industry*, edited by Etsuo Abe and Yoshitaka Suzuki. Tokyo: University of Tokyo Press.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: Cambridge University Press.
- Ostrom, Elinor. 1991. "Rational Choice Theory and Institutional Analysis: Toward Complementarity." *American Political Science Review* 85(1): 237-243.

Ostrom, Elinor. 1992a. "Community and the Endogenous Solution of Commons Problems." *Journal of Theoretical Politics* 4(3): 343-351.

Ostrom, Elinor. 1992b. *Crafting Institutions for Self-Governing Irrigation Systems*. San Francisco: Institute for Contemporary Studies Press.

Otsuka, Keijiro, Gustav Ranis, and Gary Saxonhouse. 1988. *Comparative Technology Choice in Development: The Indian and Japanese Cotton Textile Industries*. London: MacMillan Press.

Popper, Karl. 1970. "Normal Science and Its Dangers." Pp. 51-58 in *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4*, edited by Imre Lakatos and Alan Musgrave. Cambridge: Cambridge University Press.

Ramseyer, J. Mark. 1991. "Legal Rules in Repeated Deals: Banking in the Shadow of Defection in Japan." *Journal of Legal Studies* 20: 91-117.

Reisser, Jakob. 1906. *Zur Entwicklungsgeschichte der deutschen Grossbanken mit besonderer rucksicht auf die konzentrationsbesterbungen*. Jena: Fischer Verlag (English: *The German Great Banks and their Concentration*, Washington, Government Printing Office, 1911).

Ricoeur, Paul. 1992. *Oneself as Another*. Translated by Kathleen Blamey. Chicago: University of Chicago Press.

Rivera-Batiz, Luis A. and Paul M. Romer. 1991. "International Trade with Endogenous Technological Change." National Bureau for Economic Research. NBER Working Paper 3594.

Romer, Paul M. 1986. "Increasing Returns and Long-run Growth." *Journal of Political Economy* 94: 1002-1037.

Romer, Paul M. 1989. "Human Capital and Growth: Theory and Evidence." National Bureau of Economic Research. NBER Working Paper 3173.

- Romer, Paul M. 1990. "Are Nonconvexities Important for Understanding Growth?" *The American Economic Review* 80(2): 97-103.
- Rorty, Richard. 1979. *Philosophy and the Mirror of Nature*. Princeton: Princeton University Press.
- Rorty, Richard. 1986. "Pragmatism, Davidson and Truth." Pp. 333-355 in *Truth and Interpretation: Perspectives on the Philosophy of Donald Davidson*, edited by Ernest LePore. Oxford: Basil Blackwell.
- Rosenstein-Rodan, Paul N. 1943. "Problems of Industrialization of Eastern and South-Eastern Europe." *Economic Journal* 53: 202-211.
- Rousseau, Jean Jacques. [1772] 1984. *The Social Contract*. Translated by Charles M. Sherover. New York: Harper & Row.
- Sabel, Charles F. 1993. "Constitutional Ordering in Historical Context." Pp. 65-124 in *Games in Hierarchies and Networks*, edited by Fritz W. Scharpf. Boulder: Westview Press.
- Sabel, Charles F., John R. Griffin, and Richard E. Deeg. 1993. "Making Money Talk: Towards a New Debtor-Creditor Relation in German Banking." Unpublished Manuscript
- Sako, Mari. 1992. *Prices, Quality and Trust: Inter-firm Relations in Britain and Japan*. Cambridge: Cambridge University Press.
- Samuels, Richard J. 1987. *The Business of the Japanese State: Energy Markets in Comparative and Historical Perspective*. Ithaca, NY: Cornell University Press.
- Schon, Donald A. 1993. "Hirschman's Elusive Theory of Social Learning." Department of Urban Studies and Planning, MIT. Unpublished Manuscript
- Sen, Amartya K. 1979. "Rational Fools: A Critique of the Behavioral Foundations of Economic Theory." Pp. 317-44 in *Scientific Models and Man*, edited by Henry Harris. New York: Oxford University Press.

- Shingo, Shigeo. 1989. *A Study of the Toyota Production System from an Industrial Engineering Viewpoint*. Translated by Andrew P. Dillon. Cambridge, MA: Productivity Press.
- Smitka, Michael J. 1991. *Competitive Ties: Subcontracting in the Japanese Automobile Industry*. New York: Columbia University Press.
- Streeck, Wolfgang. 1990. "Interest Heterogeneity and Organizing Capacity: Two Class Logics of Collective Action." Centro de Estudios Avanzados en Ciencias Sociales. Estudio Working Paper 1990/2.
- Streeck, Wolfgang and Philippe C. Schmitter, ed. 1985. *Private Interest Government: Beyond Market and State*. London: Sage Publications Ltd.
- Streeten, Paul. 1959. "Unbalanced Growth." *Oxford Economic Papers* 2: 167-90.
- Teubner, Gunther. 1992. "Ist das Recht auf Konsens angewiesen? Zur sozialen Akzeptanz des modernen Richterrechts." Pp. 197-211 in *Kommunikation und Konsens in modernen Gesellschaften*, edited by Hans Joachim Giegel. Frankfurt am Main: Suhrkamp.
- Tyson, Laura D'Andrea and John Zysman. 1989. "Developmental Strategy and Production Innovation in Japan." Pp. 59-140 in *Politics and Productivity: The Real Story of Why Japan Works*, edited by Chalmers Johnson, Laura D'Andrea Tyson, and John Zysman. Cambridge, MA: Ballinger.
- Unger, Roberto Mangabeira. 1987. *Politics, a Work in Constructive Social Theory*. New York: Cambridge University Press.
- Wade, Robert. 1990. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. Princeton: Princeton University Press.
- Williamson, Oliver E. 1975. *Markets and Hierarchies: Analysis and Anti-Trust Implications*. New York: Free Press.

Williamson, Oliver E. 1991. "Comparative Economic Organization: The Analysis of Discrete Structural Alternatives." *Administrative Science Quarterly* 36(2): 269-296.

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