

# Understanding China's Economic Transformation

Are there lessons here for the developing world?

*Daniel W. Bromley & Yang Yao*

## I. The problem setting

Over the past quarter-century, the Chinese economy has proven to be one of the more dynamic and rapidly changing regimes in recent history. This profound growth performance is the empirical manifestation of sweeping institutional reforms carried on since the late 1970s. One brief table conveys the essential message.

**Table 1: China's recent economic performance**

	1997	1998	1999	2000	2001	2002	2003	2004
GDP (billions RMB)	7,446	7,834	8,207	8,947	9,732	10,479	11,669	13,652
Real GDP growth	8.8	7.8	7.1	8.0	7.5	8.0	9.1	9.5
Urban per capita income	5,140	5,425	5,854	6,280	6,860	7,702	8,500	9,422
Rural per capita income	2,080	2,162	2,210	2,253	2,366	2,476	2,622	2,936

Source: US-China Business Council (<http://www.uschina.org/statistics/economy.html>).

China's GDP has almost doubled between 1997 and 2004 (real RMB), with the annual change in GDP approaching 8.3 percent per year. Despite this impressive performance, the bottom two rows capture the dilemma in China's recent growth. While urban per capita income has increased by 83 percent over this eight-year span, rural incomes have increased only 41 percent over this same period. Disparities between rural and urban

---

Daniel W. Bromley is Anderson-Bascom Professor of Applied Economics at the University of Wisconsin-Madison. Yang Yao is Deputy Director of the China Center for Economic Research at Peking University in Beijing.

incomes are now among the most severe of any country in the world. That is, the profound transformations have been in the “money belt” from Guangdong province up the east coast to and beyond Shanghai. The lessons to be drawn from this experience hold important implications for the development prospects of the remainder of the world’s struggling economies. We shall use the *process* of institutional reforms in China to motivate a reconsideration of the standard development prescriptions emanating from major international organizations such as the International Monetary Fund and the various United Nations development banks—the World Bank, the Asian Development Bank, The Inter-American Development Bank, the African Development Bank, and the European Bank for Reconstruction and Development.

We start with a general overview of the economic institutions of a society. We then turn to a brief discussion of the role of volitional pragmatism in institutional change. We will then describe and elaborate the core pragmatic commitments of China’s recent institutional transformation both conceptually and by describing a few of the empirical manifestations of that approach. We close with a few implications for the general problem of economic development and the role of the international community in fostering that desired outcome.

## II. On economic institutions

Consider a stylized description of contemporary nation-states. At the highest level there exists a small group of individuals (perhaps called justices or judges) who exercise oversight of a founding charter. This charter embodies the *Constitutional Rules of the Society*. These rules indicate, for example, who may and who may not vote, what issues shall be determined by which members of the polity, which rules are legitimate for others (parliaments, city councils, individual entrepreneurs) to craft, and how the charter itself may be modified (amended) by subsequent citizens.

This foundational charter establishes a second group of citizens whose job it is to consider and to formulate the *Instrumental Rules of the Economy*. This group of individuals belongs to entities that are generally called politburos, cabinets, parliaments or legislatures. Here we encounter ordinary “law-making.” Examples of instrumental rules are strictures concerning the age at which one might drive an automobile, the specific conditions

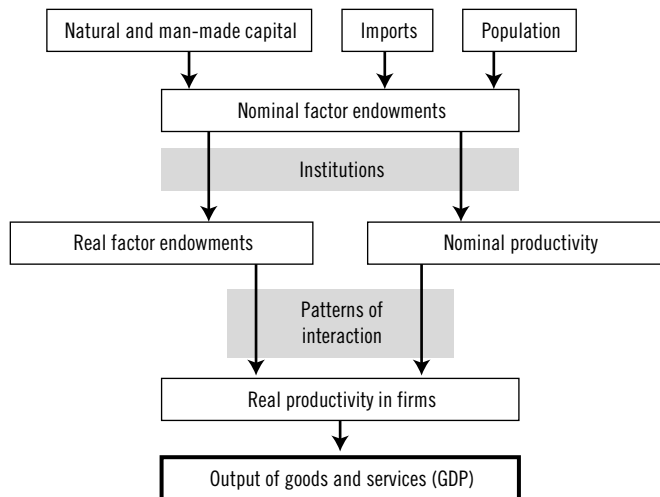
whereby a group of individuals might form a limited liability company, and the precise chemical composition of industrial wastes making their way into the atmosphere. Other instrumental rules might entail the legal number of hours per week that hourly (wage) employees may work, the required rate of pay if necessary work exceeds that number, and the inspection schedule of all meat-processing facilities. The instrumental rules of the economy also reach into households and define socially acceptable rules of individual behavior—the legal duties of parents to have their children in school until a particular age, who and who may not get married, the tax rate for households of different composition, and what must be done if the marriage contract is to be sundered.

Finally, at a third level, we come to the *Working Rules of Going Concerns*. Such working rules might indicate, for instance, the pay scale for people employed at a particular firm, the length of paid vacation per year, and the steps that must be taken if an employee with a particular level of seniority in the firm wishes to request a day off from work to care for a sick child. We must see these institutional arrangements as layered or nested—rather like a Russian *Matryoshka* doll. The Instrumental Rules of the Economy are nested within—are constrained and liberated by—the Constitutional Rules of the Society. The Working Rules of Going Concerns are nested in—are constrained and liberated by—both the Constitutional Rules of the Society *and* the Instrumental Rules of the Economy. We see here the multi-layered institutional architecture of an economy.

Consider Figure 1—an adaptation of a figure from Dani Rodrik [2003]. At any moment we can describe the economy in terms of three physical building blocks. There is a stock of natural capital—soils of various quality, trees, mineral deposits, rivers, coastal ecosystems, and stocks of living resources in territorial waters. In addition, there is a stock of man-made capital—factories, machinery, railroad tracks and rolling stock, other transportation assets, and energy production facilities. These indigenous assets can be augmented in any period by imports. The other building block is the stock of human capital at a given time. In each of these cases it is important to understand that there are both quantity and quality aspects to this bundle of endowments.

Notice in Figure 1 that we refer to this bundle of factor endowments as *nominal* endowments. They are nominal because they are not yet mediated by the institutional architecture of the economy. For example, the

**Figure 1: The stylized Chinese economy**



Modified from: Dani Rodrik, *In Search of Prosperity*, 2003.

nominal endowment of forests might cover 10 percent of the total area of a country, but if 25 percent of that is protected in forest reserves—an institutional arrangement decreed by central or provincial governments—then the *real* forest endowment available for productive purposes is only 7.5 percent of total area. While this particular institution is *endogenous* to the polity and economy, it is *exogenous* to firms, households, and lower-level political entities that might wish to make use of the forest. On the population side, let us assume that the total population of a country is 40,000,000. The share of this population representing potential labor might be 26,000,000 (excluding the dependent population of the young and retired). However, if 15 percent of the potential labor force is continually unavailable because of maternity leave, sick leave, or other reasons, the effective (real) labor force is 22,100,000.

Institutions provide the mediation that transforms nominal endowments into real (deployable) endowments upon which economic activity can be based. A second role of institutions is to define the work environment inside of firms where labor and management are deployed in conjunction with the (real) factors of production. Here we encounter, *inter alia*, terms of employment, work conditions, wage rates and salary levels,

terms of engagement between workers and bosses, ownership or rental arrangements for agricultural land, and taxes on labor or net income. Notice in Figure 1 the concept of “nominal productivity.” While institutions specify the nature and extent of *real* factor endowments, these institutions cannot *fully* parameterize the intricate incentive issues associated with the classic principal–agent problem. That is, the formal working rules of the economy cannot possibly determine the *real* productivity of labor, management, and capital. Workers and bosses and others involved in the production process are themselves engaged in game-theoretic interactions—the sum total of which we can consider as giving rise to actual (*real*) productivity. The evolution of norms and standardized behavioral characteristics associated with endogenous institutional change occur at this level.

We see that the entire constellation of institutions can be understood as providing the *legal foundations of the economy* [Commons, 1995]. In general, institutions indicate what:

Individuals *must* or *must not* do (*duty*), what they *may* do without interference from other individuals (*privilege*), what they *can* do with the aid of the collective power (*right*), and what they *cannot* expect the collective power to do in their behalf (*no right*).

[Commons, 1995, p. 6]

The significance of the distinction between *imposed* institutional arrangements and the subsequent *induced* institutional arrangements emanating (cascading) down through the economy is obvious. That is, the imposed institutional arrangements are the conscious and purposeful instruments of national (and provincial) economic policy. These institutions are under the control of those entities charged with this task—parliaments, courts, executive agencies. These entities issue sets of rules—imposed institutions—whose purpose is to parameterize individual and behavior in particular realms of economic activity. In response to these new instrumental rules of the economy, induced institutional arrangements will then be worked out (and specified) in a manner consistent with the general parameters set by the exogenous institutions. These induced responses are the working rules of going concerns. We see that imposed institutions do not simply constrain individual and group behavior—they also liberate behavior. Under these new institutional structures, individuals within

going concerns will experiment and begin to interact in new ways. In so doing, we see endogenous institutional change at work—and correlated evolved behavioral patterns.

With this brief introduction to the institutions of an economy, let us turn to the process whereby these institutions undergo change. To provide empirical substance, we will develop the account in the context of institutional change in post-Maoist China.

### III. Volitional pragmatism in China

The story starts with Hu Shi (1891–1962), who was born in Shanghai, gained an undergraduate degree at Cornell University, and then moved on to Columbia University where he received his Ph.D. under the direction of the pragmatic philosopher John Dewey. Hu returned to China in 1917 to become professor of Philosophy at Peking University. He served as Ambassador to the US from 1937–1942, finally returning to China in 1946 to become Chancellor of Peking University. Hu fled to the US around the liberation in 1949, and then later moved to Taipei where he served as president of the highly regarded Academia Sinica Research Institute. The story ends with Deng Xiaoping who, in a moment of philosophical insight and political acumen, observed that he did not much care if the cat was black or white, all that mattered was whether or not the cat could catch mice. Dewey would have admired Deng that. Deng's maxim to "build socialism with Chinese characteristics" would serve him well in his subsequent political struggles following the death of Mao Zedong in 1976. Deng managed to meld Mao and Hu (and of course Dewey) in his quest to push China onto the world's economic stage. One would recognize Deng as the ultimate pragmatist. What exactly is pragmatism, and how does it help us understand China's institutional transformation in particular, and the process of economic reform in general?

Charles Sanders Peirce (1839–1914) offered the following pragmatic maxim:

Consider what effects, ..., we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object.

[Charles Sanders Peirce, 1934, p. 1]

Peirce was here urging philosophers (and the rest of us) to move beyond representationalism and to understand that for practical purposes (and pragmatists believe that *practical* purposes dominate human thought), it is the effects (that the objects of our conception hold for us) that matter. The object of Deng's conception was the *effects of cats on mice*, not whether cats are white or black. Peirce offered another useful idea: "...the action of thought is excited by the irritation of doubt, and ceases when belief is attained; so that the production of belief is the sole function of thought [Peirce 1957, p. 36]." This brings us to the method of abduction—the main epistemological program of volitional pragmatism. Aristotle called it diagnosis. Peirce called it the *method of hypothesis*, or *abduction*. It is also known as inference to the best explanation. An abductive argument is of the form:

The surprising fact, **C**, is observed:  
 But if **A** were true, **C** would be a matter of course,  
 Hence, there is reason to suspect **A** is true.

Abduction starts when particular circumstances and events—the surprising fact **C**—are encountered for which we need an explanation. In the above syllogism, the assumptions embodied in [**A**] comprise the plausible explanation of the observed fact [**C**]. Human action is animated by doubt or surprise. As we see above, Peirce talked of the "irritation of doubt." Why is unemployment increasing? Why is the manufacturing sector experiencing sluggish productivity? Why are rice yields stagnating?

In abduction, we deploy specific known relations and particular assumptions—predicated on existing analytical models and known empirical relationships—to formulate propositions (testable hypotheses) with the intent of *explaining* those particular events. If you are trying to explain falling productivity, abduction is your avenue to explanation. The essential purpose of abduction is the *production of belief* about specific events. To quote Peirce again: "The object of reasoning is to find out, from the consideration of what we already know, something else which we do not know [Peirce, 1877, p. 9]."

In the China of 1949–1978, there was a single and quite clear motivation and belief structure that provided the *reasons for all rules*, and those rules in turn determined patterns of interaction both within and among firms and households in China. However, as Deng Xiaoping gradually gained

political authority in the late 1970s, and as his interest in reform matured, his beliefs were undergoing transformation. He still adhered to some of the core principals of the Maoist regime, but he was open to new ideas about organizing production. As Lord Keynes once observed (so we are told), “When the facts change, I change my mind. What do you do, sir?” Deng’s lack of interest in the color of mice-catching cats is emblematic here. We see that the core of pragmatism is concerned with purpose. The pragmatist will ask: “for what purpose would it be useful to hold particular beliefs [Rorty, 1982]?” For Deng, the clear purpose was to bring China into the globalizing economy, and to improve the life prospects of the average citizen.

Pragmatism is central to economic policy because policy reform (institutional change) is necessarily the essence of experimentation and a recursive process of figuring out (learning about) what “works.” Notice that every policy prescription is also a prediction. “If you wish to bring about  $X$  then it is necessary that you do  $Y$ .” The policy prescription ( $Y$ ) necessarily predicts the occurrence of the desired outcome ( $X$ ). The very act of prescribing (and thus predicting) invites observation, monitoring, assessment, feedback and perhaps a modification in the prescription ( $Y$ ) when the prediction about outcomes ( $X$ ) turns out other than expected. The much-criticized Washington Consensus is the antithesis of experimentation. There, deductive convictions are advanced as universal truths (eliminate subsidies, reduce government employment, establish property rights, create the rule of law, etc.). This may explain why the results have often been meager and contested [Easterly, 2001; Rodrik, 2003; Stiglitz, 2002]. Institutional change must be understood as purposeful experimentation, because all economic policy requires pathways for feedback from the observations of new patterns of interaction which then inform the desire to try plausible new institutional arrangements.

We now turn to an elaboration of pragmatism and recursive policy innovation and reform.

#### **IV. On recursive institutional change**

As suggested above, the development problem often proceeds with two stylized individuals in mind. First there is the Washington Doctor (of the Consensus) dispensing 10 exact (though vague) prescriptions with the

advice to take all 10 of these and things will soon pick up [Williamson, 2000]. As above, the results of the Washington Consensus are much debated. Standing opposed to this prescriptive certitude is a stylized Social Planner who tries, unsuccessfully, to manage (control) all economic processes. The Washington Doctor, issuing prescriptions, strives to get the institutional pre-conditions *just right*. The Social Planner tries to manage specific aspects of the economy by picking winners, by calling for specific output targets, and often by seeking to manage the composition of the output from particular sectors. We will use a stylized account of the Social Planner's problem to motivate an explanation of Deng's version of volitional pragmatism.

### A. The social planner

The planner's problem is usually cast as one of searching across all sectors to manipulate input and output decisions in order to accomplish particular objectives. The standard criticism of the Social Planner is that all decisions are fouled by the system in which information is highly unreliable. Not only is the world highly stochastic, participants in the system constantly confound the expectations that the planner has for them. Since the planner desires to obtain early indications of future output problems, there is a need to obtain early indications of incentive problems embedded within each sector. In a planned economy, this is doubly difficult because agents within each sector will have an array of incentives—often perverse—concerning the information they are willing to transmit to others. The Social Planner is faced with a dual (and quite unstable) search problem. The first level is to monitor output signals to make sure that the economy as a going concern is “working” as it should. The second level is to monitor the production processes within sectors to make sure that incentives are appropriately aligned.

When problems appear on the horizon, the planner's task is to decide which sectors warrant immediate attention. The planner interprets this need in terms of detailed knowledge of the structure and function of the components of each sector. Approaching the issue in this way compounds uncertainty, since a particular refinement in one sector will have imperfectly known implications in all other sectors. Some of these changes may imply that the planner overshoots in one sector, and undershoots in another sector. But the problem is actually worse than that. Specifically,

there is no one in this economy with plausible empirical knowledge of existing production functions and institutional arrangements within or among sectors. Simply put, there is no empirical basis for judging which type of institutional change is required within sectors to maximize the probability of inducing the *imagined* outcome being sought by the planner. This is not a realm of managing risk—it is a realm of complete uncertainty. It cannot be a surprise that the plans in “planned economies” are often misguided, badly implemented, impossibly complex, and generally counterproductive.

The multiple layers of high information costs and comprehensive uncertainty necessarily defeat the *a priori* optimization approaches of the standard prescriptive variety. Rather, the planner must undertake a quest for adjustment that builds on stylized goals and objectives, unclear causal relations, and little experience with the “dose-response” problem familiar to medical researchers. Just because the planner knows that some institutional change is called for does not mean that the planner knows: (1) where (in which sector) to focus his efforts; (2) where within particular sectors is the best place to adjust institutional arrangements; (3) which institutional arrangements seem the most plausible and effective ones to adjust; and (4) what implications will flow from specific institutional refinements (the dose-response problem).

In the face of this, it seems necessary to re-frame the classic planner’s problem as one of discovering what he really wants as he goes about the task of figuring out what he seems able to accomplish. The planner reasons about what he thinks he can accomplish as he reasons about what he seems able to achieve through institutional adjustments. The planner cannot get it “right” or get it “wrong” because there is no right or wrong. There are simply new institutional adjustments that seem—once they have been introduced and monitored—to move the economy in a direction that is better (welfare enhancing for the planner) than the *status quo ante*. But the planner will not have an *a priori* concept of “better.” The planner will bestow that benediction when the results are in. And the planner will use the accumulated information as a competent but not omniscient Bayesian in an effort to learn and refine the process of institutional change into the future [Bromley, 2006].

The social planner, as with the confident dispenser of the Washington Consensus, is defeated by the unavoidable problems of *a priorism* in eco-

conomic affairs [Hardin, 2003]. As any good CEO can tell us, one manages complex organizations not by explicit directives but by proposing, processing feedback, re-proposing, and once again processing feedback. Good managers manage by adjustment. One way to capture this tentative grip on prescriptive consequentialism is to regard the *real* (as opposed to the imaginary) social planner as an orchestra conductor. How did Deng operate as a conductor?

## B. Deng the conductor

As China emerged from the chaos and dirigisme of Mao Zedong, Deng aspired to transform the nature and content of the Instrumental Rules of the Economy. More particularly, he pushed the authoritative agents (the Central Committee and the National People's Congress) to begin to act like a conductor instead of a planner. That is, he worked hard to see that these two dominant entities became the *locus of purposeful guidance concerning desired general directions for the Chinese economy*. The metaphor of a conductor is helpful because it suggests the way in which an orchestra conductor undertakes the process of producing coherent music out of a large number of independent and highly skilled entrepreneurs. The conductor of an orchestra cannot *require* that each member of the orchestra do exactly as he desires. The conductor does, of course, hold some considerable influence over what they shall do, and he is able to sanction in the future those who fail to meet his expectations. But the conductor cannot exert his will over the members of an orchestra in the sense of forcing them to do what they are disinclined to do. He must "pull" the music out of them.

In the current setting, we assume that Deng and his supporters had plausible knowledge of the general structure of factors of production, and we assume that they also had knowledge of the set of "acceptable" consumption programs for the economy (more rice, more refrigerators, fewer bicycles, more designer jeans). Of course, they (as the conductor) had limited knowledge of specific production activities. While such information problems would cripple the earnest planner, these shortcomings did not much concern the conductor. The conductor knows quite well the recent record of outputs of various sectors, and knowing the vector of inputs available to those sectors allows some workable assumptions to be drawn. Estimates emerge from careful discussions with experts.

*The central challenge for the conductor is to formulate institutions (instrumental rules of the economy) that will send signals to the managers of firms.* Those signals will be regarded as the necessary conditions for the expected realization of a new sector-wide production program whose realization constitutes the sufficient condition for issuing the new institutions (the new instrumental rules of the economy). These institutions (these rules as signals) can take many forms. They might concern a modification in the minimum wage that must be paid in a particular sector. They might concern the elimination of a particular excise tax on the value of production from another sector. While a new institution could also pertain to all sectors in the economy (e.g. new tax rates on all earned income), the more plausible approach is to focus on sector-specific institutional changes.

A second challenge for the conductor is to understand that the issuance of new institutions (new instrumental rules) is but the first step in a two-way learning game that Hurwicz refers to as the *environment* [Hurwicz, 1973]. That is, the environment consists in a set of circumstances that cannot be changed either by the designer of the mechanism (the new institution), or the agents to whom the new institution is directed (the managers and perhaps future owners of firms in a particular sector thought to be in need of new working rules to bring forth different production outcomes). The practical implication of this is that when the conductor issues new institutions—new rules as signals—these new rules are assumed to be the only change in the production set of that sector. Of course, the sector targeted by these new rules will then respond in some fashion to those new rules. That is precisely the *reason for the new rules*. But the complete nature and scope of those responses cannot be foreseen by the conductor. Nor is it problematic for the conductor that they cannot be foreseen.

It is here that we encounter endogenous institutional change. That is, managers and workers who receive the new signals—individuals who are the recipients of these institutional changes—will respond by moving to undertake a new production program whose precise content cannot be known by the conductor. All the conductor will be able to observe, at some time in the future, is a change in the output vector of that sector. Note also that while quantitative changes in the production vector of the sector will become mostly apparent in one or two production periods, it may take much longer for quality differences—if any should happen to emerge from the new institutional arrangement—to show up.

Hurwicz refers to this entire process of: (1) new rules (new institutions); (2) an induced response at the sector level(s); and (3) then forms of feedback to the conductor, as a process of *tâtonnement* [Hurwicz, 1973]. That is, this is a period of *dialogue without action*, followed by decisions in production and consumption routines. Notice that part of this dialogue might well take non-verbal forms—it may be mediated by the mere observation of data. Some of the participants in this dialogue could include staff assigned to the conductor, the central as well as regional banks, other credit agencies, and even worker's associations. The totality of messages under a given mechanism constitutes the *language* of that mechanism [Hurwicz, 1973]. Under Walrasian *tâtonnement*, the language consists of prices and quantities. In this setting, the language consists of signals pertaining to desires of the conductor, intentions, plans, constraints, counteroffers, threats, and perhaps grudging resistance. The full adjustment process is defined by the environments as a *fixed platform*, and then the language, the response rules, and the outcome rule.

Before moving on, we must address the matter of incentive compatibility. This necessity arises because it is here that both the Washington Consensus and the Social Planner run afoul of “reality out on the ground.” In the limit, pure incentive compatibility is revealed if and only if the response in a specific sector is precisely coincident with the embodied intentions of the conductor who issued the specific institution under consideration. Deviations from those exact intentions are an indication of the extent to which the transmitted signal embedded in the institution (that is, the *empirical content* of the institution) is at odds with the interests and tendencies of the agents whose behavior the new rules were intended to alter. That is, when the induced (endogenous) institutional change in response to a new imposed institution is precisely embodied in the new signal from the conductor, then the new rule was perfectly incentive compatible. A perfect Nash equilibrium is indicative of this property. Social planners rarely produced incentive compatible production plans. The prescriptive urge of the Washington Consensus simply ignored incentive compatibility. Little wonder that the prescriptive certitudes of the Washington Consensus have had such modest effects.

Returning to the earlier point about the adjustment process as a learning exercise, Weitzman reminds us that the conductor comes to learn about the production and adjustment process of various sectors as the

process of new rules and induced responses unfolds over a period of time (over several production cycles). With enough observations, and with careful updating of technical and behavioral circumstances from each sector, the conductor can learn “enough” about the production function of each of the sectors. The more chances there are to issue new rules and observe responses, the better that knowledge of the production set becomes. For very critical sectors—agriculture, military procurement, heavy industry—the more important it becomes to have regular empirical checks on the production set.<sup>1</sup>

Whereas the classic planner would seek to impose a specific production quota on firms, our conductor seeks to *alter the institutions that define the production set* for all firms in a given sector. Assume firms in a sector produce both steel and sheet metal—both of which are used elsewhere in the economy. The conductor desires an increase in both outputs. The standard approach would be to assign a quota for firms in the sector. Traditionally, managers of such firms would then seek to educate the planner as to the infeasibility of the quota and they would do this by countering with an alternative offer, or they would simply fail to respond.

In our model this need for negotiation is avoided because instead of the planner mandating the production of specific outputs, the conductor issues a new constellation of institutions that he believes (imagines, predicts) will move firms in the desired direction. These new institutions induce an adjustment process inside of firms that the conductor hopes (expects) will accomplish the desired effect. Once the new institutions are understood by managers of firms, these managers then initiate a process of their own institutional reform (here called the Working Rules of Going Concerns) informed by (and in concordance with) the new rules issued by the conductor. Firms work out their best response in light of the new pertinent economic environment. But of course managers are bound by the extant *production feasibility set*. Perhaps the capital stock of the firms is so deficient that no amount of institutional reform will render the new production set attainable? Or, perhaps the new institutions issued by the

---

<sup>1</sup> We find a similar process at work in certain manufacturing sectors in the US. Large automobile manufacturers will buy parts (brakes, generators) from independent suppliers, but they will also manufacture those same items themselves. Oliver Williamson points out that the standard decision of whether to “make or buy” overstates the case. By manufacturing certain parts themselves, manufacturers of cars learn about the production function for those products such as brakes and generators, and this information gives them an advantage in negotiating per-unit prices with external suppliers.

conductor are insufficient to induce the desired response inside of firms? After several rounds of experimentation, the desired production goals are approached, if not actually met. If the plans are exactly attained, it is evidence that the iterative process of institutional change turned out to be perfectly incentive compatible with the agents (both managers and employees) within the firm. That is, the conductor was able—after several attempts—to induce the firm to move to a specific production point while allowing the agents within the firm to create (innovate) their own special induced response such that the resulting production set and their deployment within it turns out to be Pareto-efficient.

We now turn to the empirical dimension of our model of institutional change and economic reform.

## V. The empirical account

We briefly discuss three realms in which the model of a conductor is helpful in understanding the nature and content of the economic reforms initiated by Deng in 1978.

### A. The Special Economic Zones

In 1979, the government issued a modest set of new institutional arrangements permitting provincial political leaders and local managers to begin the process of induced institutional change. These permissive instrumental rules were particularly focused on Guangdong and Fujian provinces in southeast China. Notice that the conductor (Deng) did not (and could not) require greater production of particular goods from particular firms in particular locations. Rather, the government issued *permissive* institutional arrangements that then offered local and district officials the scope and latitude to negotiate with firms inside their jurisdiction to begin the process of *gaizhi*—transforming the system. We can think of this as the second stage of induced institutional change once a liberating directive came from the Central Committee. We can also see this as cities and districts within this special economic zone began acting as “firms” (as going concerns) competing to provide a greater range of economic opportunities for factories and other entities in pursuit of the best possible results. Here, the concept of “best results” entails new economic activity and job growth within specific districts.

## B. Agricultural Reforms<sup>2</sup>

China's agricultural transformations since 1978 offer a somewhat different opportunity to assess imposed and induced institutional change. The unique aspect here is that many changes authorized by the conductor were in fact inspired by early experimentation out on the ground. Specifically, there had always been a limited range of local institutional arrangements in agriculture—even during the period of imposed collectivization. These variations were common knowledge among local officials (and national leaders) who nonetheless allowed them to persist. Pragmatists believe in observing the effects of actions—which cats catch the most mice?

Beginning in 1978, two years after Mao's death, Wan Li, the Provincial Governor of Anhui province explicitly permitted (Deng stayed behind the scenes) production teams to divide and lease land to households. When the experiment seemed to go well, the conductor (the Central Committee of the Chinese Communist Party) in 1981 offered official ratification of the emerging system. By this time, patterns of interaction in agriculture had further evolved and had been transformed at the local level in an example of induced (endogenous) institutional change.

Between 1978 and 1983, the gross value of agricultural output grew by about 7 percent per year compared to an annual growth rate of 3 percent over the two decades prior to the reforms. Rural incomes per capita more than doubled over this same period. In 1978, per capita savings in rural areas had averaged Y18, while by 1983 rural savings per capita had increased to Y60 [Bruce and Harrell, 1989]. This early innovation was termed a move to the *production responsibility system* (PRS)—a new set of rules from the conductor that differed substantially from those under the collective era (1958–1978). The reforms under the PRS initially took several forms: (1) a reduction of the size of the basic working group; (2) a decentralization of decision making in the production process; and (3) a change of distribution scheme aimed at promoting work incentives [Kueh, 1984]. However, within four years (1979–1983), the various institutional arrangements on the ground tended to converge to one basic institutional structure that is now referred to as the *household responsibility system* (HRS).

The essence of the HRS was the replacement of the production unit by the individual household as the basic unit of: (1) production; (2) income

---

<sup>2</sup> Some of this material is adapted from a nested principal–agent model in Xue-Lascoux and Bromley, 1996.

distribution; and (3) accounting in agriculture. Under the HRS, cultivated land in a village was assigned to each household via contracts typically specifying the amount of land to be cultivated, the nature and amount of inputs to be supplied by the collective, the expected level of production, an agreed quota of staple crop production to be sold to the state, the amount to be handed over to the collective and, in some cases, the number of days of labor to be contributed to maintenance of public works [Bruce and Harrell, 1989]. The burden of agricultural taxation was also shifted to households. Draft animals and divisible farm equipment, previously under the possession of the production team, were also allocated to households for their use.

Until 1984, the prevalence of the HRS had caused little controversy. The system was typically perceived as being more productive than the previous institutional arrangements because it offered work incentives through the provision of a closer link between reward and effort as measured by output [He, 1993; Huang, 1993; Lardy, 1986; Lin, 1987, 1988, 1992; Nolan and Paine, 1986]. After 1984 however, the alleged benefits of the HRS began to be challenged. It was soon noticed that there was a serious absence of incentives for peasants to invest in and to maintain agricultural land. That is, use rights alone did not seem sufficient to insure productivity over the longer term. The efficacy of the land-assignment scheme under the HRS was also questioned. The argument was advanced that the scheme encouraged small-scale farming, excessive scattering of plots, and inappropriate land/labor ratios [Kueh, 1985; Wen, 1989; Bruce and Harrell, 1989]. Crop output, especially grains, stagnated after 1985. Doubt and surprise once again animated serious thought.

The late 1980s witnessed yet another wave of discussions concerning the proper institutional arrangements in agriculture. After the "illusion" of having successfully concluded the previous experiments on land policies—the 1950 land reform, the 1958 collectivization, and the 1978–1983 devolution to the HRS—the search for better institutions was once again on the research agenda. Around 1984 the conductor granted local authorities greater latitude in the design of agricultural institutions, and local experiments were explicitly encouraged. Households were now permitted to employ or sell labor for farm work. Sub-leasing was sanctioned so that the undesirable land/labor ratios resulting from the land-assignment scheme could be adjusted. The land contract period was extended up to

15 years to promote long-term commitments to land improvement. In 1983, farmers were allowed to undertake private marketing and transportation of many products. Moreover, they could transfer their contracts, lease their land, and even move to a factory job elsewhere. At this time, non-state enterprises were granted a lower tax rate (35%) than were state enterprises (55%) based on the recognition that non-state firms had to compete for inputs whose costs may exceed those in the controlled state sector. In 1985, mandatory government purchases of grain, cotton, and edible oils were abandoned in favor of long-term sales contracts between farmers and government. This brought a much greater share of agricultural production on to the market. However, urban prices began to fluctuate in response to supply and demand circumstances and the associated price rises prompted a partial retreat. Since that time of general permissive institutional change, a number of other innovations have followed.

Both the HRS, and the variety of institutional arrangements that followed constitute a set of rules concerning two primary issues: (1) property relations over arable land; and (2) the organization of production activities. The two issues are clearly interrelated because the choice set of organizational forms for production is defined, to a large extent, by the rules that specify the right/duty relationships among people with respect to land use and the control of land. Of particular concern here is, who has access to particular plots of land, what are the conditions of access to that land, and who has a presumptive right to the products from the land? The differences in institutional arrangements embedded in property relations and reflected in the organization of production encompass three aspects: (1) the nature and size of the working group; (2) the organization of the production process itself; and (3) the distribution of income arising from the production activities.

One final (and recent note) on institutional reform in agriculture seems warranted. In the summer of 2005 the central government (the conductor) eliminated the agricultural tax—a serious burden for about 900,000,000 rural residents. This move was undertaken in the hope of improving the livelihoods of rural people and narrowing the large (and growing) gap between rural incomes and those in the thriving east-coast urban areas (Table 1). However, the central government failed to incorporate the induced response from local units of government who had previously relied on transfers of funds from the center back to local entities to pay for

a wide range of necessary services—roads, health clinics, schools, and various others local obligations. In response to the loss of revenues from the center, local governments have recently instituted a new regime of fees and taxes. Family planning councils at the local level—administrators of the policy on the number of children—have apparently become increasingly aggressive in levying fines for violations of the rules on the number of children in a family. The central government reported a pronounced increase in the number of local “incidents” in 2004 in apparent protest of economic hardship in rural areas. The elimination of the hated agricultural tax was thought to be a major impetus for such protests. Now, however, it seems that there are yet new reasons for rural unrest. Doubt and surprise are now motivating the fixing of a new belief. We await the institutional response from the conductor to these new settings and circumstances.

### C. State-owned enterprises

The early successes in agricultural reform served as the launching pad for an equally sweeping reform of the state-owned enterprises (SOEs) [Garnaut, *et al.*, 2005]. In 1984, reassured that a general loosening of controls would inspire induced innovation within firms, the Central Committee authorized a variety of permissive institutional possibilities. A contracting system was introduced that required managers to meet various performance targets (*not* production targets) such as sales, profit, capital investments. These targets had to be met if managers were to be allowed to share in the profits of the enterprises. In this first round, good performance was rewarded, but failures were not penalized [Garnaut *et al.*, 2005]. Soon a leasing system emerged in which managers paid a fixed percentage of profits to the central government. By 1988, the State Council had issued new regulations on the leasing of SOEs. The Shenzhen Stock Exchange opened in 1990, followed a year later by the Shanghai Stock Exchange. The government continued to hold important shares of the stock in all privatized firms.

In 1995, the government took yet another step forward with the issuance of a decree to “keep the large ones and let the small ones go.” In response, fewer than 1,000 firms were to be retained in the state sector, while all of the others were given permission to seek their own way in an increasingly marketized economy. By the end of 1998, more than 80 percent of the state and collective firms at the level of county or below had

gone through *gaizhi* (restructuring). Since 2000, the reforms have reached into both rural and urban areas, and they have affected firms of all sizes. Bankruptcy, liquidation, listing and de-listing, debt-for-equity swaps, sales to private parties, and auctions have emerged as instruments of reform. Since 1998, over 30 millions workers have lost their jobs due to restructuring, with an estimated 9 million of them finding new employment [Garnaut *et al.*, 2005]. By 2003, the non-state sector accounted for approximately two-thirds of GDP. One year later, it is estimated that 40 percent of the continuing SOEs were losing money, compared with under 20 percent of the non-state sector [Garnaut *et al.*, 2005].

## VI. Implications

To economists interested in the relation between institutional arrangements, individual behavior, and economic performance, China's reforms over the last twenty-five years offer a natural experiment that demands an explanation. Can we draw on concepts central to contemporary economic theory to develop an explanation of this rapid institutional change? And if it is possible to develop such a theory, would this theory offer insights into the development problems facing transition economies in the former Soviet Union, and poor countries in sub-Saharan Africa and elsewhere? We believe that understanding institutional change in China is profoundly important for informing the economic theory of institutions, and for clarifying the role of institutions in other developing countries.

The main lesson, we submit, is to resist the temptations of the Washington Doctor who can be expected to dispense universal verities (prescriptions). Pragmatism reminds us that useful and constructive thought is animated by doubt and surprise. That surprise cannot, however, be focused on aggregate indicators such as per capita GDP. Rather, useful and promising surprise must be focused on the sector(s) where problems seem pronounced. Abduction then invites the careful diagnostician to search for reasons why particular outcomes (the effects of specific institutions) exist. When reasons (not causes) are found for unwanted effects, we are on our way to a resolution of the problem(s). And then it is on to the next surprise...

### References

- Brock, William A. and David Colander. 2000. "Complexity and Policy," in David Colander (ed.), *The Complexity Vision and the Teaching of Economics*, Cheltenham, UK: Edward Elgar.
- Bromley, Daniel W. 2006. *Sufficient Reason: Volitional Pragmatism and the Meaning of Economic Institutions*, Princeton, NJ: Princeton University Press.
- Bruce, John and Harrell, P. 1989. *Land Reform in the People's Republic of China 1977–1988*, Research Paper No. 100, University of Wisconsin-Madison, Land Tenure Center.
- Commons, John R. 1995. *Legal Foundations of Capitalism*, New Brunswick, NJ: Transaction Publishers (reproduction of 1924 edition by Macmillan).
- Easterly, William. 2001. *The Elusive Quest for Growth*, Cambridge, MA: MIT Press.
- Garnaut, Ross, Ligang Song, Stoyen Tenev, and Yang Yao. 2005. *China's Ownership Transformation: Process, Outcomes, Prospects*, Washington, D.C.: World Bank.
- Hardin, Russell. 2003. *Indeterminacy and Society*, Princeton, NJ: Princeton University Press.
- He, D. 1993. "Reform in Land Policy at the Village Level," (in Chinese: "Cunji Nongdi Zhidu de Biange"), in: State Council's Development Centre, *Land Reform in China: Proceedings of the International Conference on the Chinese Land Reform*, (in Chinese: Zhongguo Nongcun Tudi Zhidu de Biange: Zhongguo Nongcun Tudi Zhidu Guoji Yantao Hui Lunwen Ji), Beijing: Peking University Press.
- Huang, Q. 1993. "A Review of the Chinese Land Policy and the Current Problems" (in Chinese: "Zhongguo Nongcun Tudi Zhengce de Huigu yu Mianling de Wenti"), in: State Council's Development Centre, *Land Reform in China: Proceedings of the International Conference on the Chinese Land Reform*, (in Chinese: Zhongguo Nongcun Tudi Zhidu de Biange: Zhongguo Nongcun Tudi Zhidu Guoji Yantao Hui Lunwen Ji), Beijing: Peking University Press.
- Hurwicz, Leonid. 1973. "The Design of Mechanisms for Resource Allocation," *American Economic Review*, 63(2):1–30.
- Kueh, Y. Y. 1984. "China's New Agricultural Policy Program: Major Economic Consequences, 1978–1983," *Journal of Comparative Economics*, 8:353–375.
- Kueh, Y. Y. 1985. "The Economics of the 'Second Land Reform' in China," *China Quarterly*, 101:122–131.

- Lardy, Nicholas R. 1986. "Agricultural Reforms in China," *Journal of International Affairs*, 39:90–104.
- Lin, Justin Yifu. 1987. "The Household Responsibility System Reform in China: A Peasant's Institutional Choice," *American Journal of Agricultural Economics*, 69:410–415.
- Lin, Justin Yifu. 1988. "The Household Responsibility System in China's Agricultural Reform: a Theoretical and Empirical Study," *Economic Development and Cultural Change*, 36:199–224.
- Lin, Justin Yifu. 1992. "Rural Reforms and Agricultural Growth in China," *American Economic Review*, 82:34–51.
- Nolan, Peter and S. Paine. 1986. "Towards an Appraisal of the Impact of Rural Reform in China, 1978–95," *Cambridge Journal of Economics*, 10:83–99.
- Peirce, Charles Sanders. 1877 (1997). "The Fixation of Belief," in Louis Menand (ed.), *Pragmatism*, New York: Vintage Books.
- Peirce, Charles Sanders. 1934. *Collected Papers*, Vol. 5, Cambridge, MA: Harvard University Press.
- Peirce, Charles Sanders. (ed. by Vincent Tomas). 1957. *Essays in the Philosophy of Science*, New York: The Liberal Arts Press.
- Rodrik, Dani. (ed.). 2003. *In Search of Prosperity: Analytic Narratives on Economic Growth*, Princeton, NJ: Princeton University Press.
- Rorty, Richard. 1982. *Consequences of Pragmatism*, Minneapolis: University of Minnesota Press.
- Shackle, G. L. S. 1961. *Decision, Order, and Time in Human Affairs*, Cambridge, MA: Cambridge University Press.
- Stiglitz, Joseph E. 2002. *Globalization and its Discontents*, New York: Norton.
- Weitzman, Martin. 1970. "Iterative Multilevel Planning with Production Targets," *Econometrica*, 38(1):50–65.
- Wen, G. J. 1989. *The Current Land Tenure and its Impact on Long Term Performance of the Farming Sector: The Case of Modern China*, Ph.D. Dissertation, University of Chicago.
- Williamson, John. 2002. Institute for International Economics, posted at: <http://www.iie.com/publications/papers/williamson1102.htm>

Xue-Lascoux, Zhiqun and Daniel W. Bromley. 1996. "Necessity and Purpose in Chinese Agriculture: 1949–95," *Oxford Development Studies*, 24(3):261–80.

Yao, Yang and Michael R. Carter. 1994. *An Economic Analysis of the Property Rights Evolution in Post-Reform Rural China*, Department of Agricultural and Applied Economics, University of Wisconsin-Madison, (mimeographed).

