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WALRASIAN ECONOMICS IN RETROSPECT*

SAMUEL BOWLES AND HERBERT GINTIS

Two basic tenets of the Walrasian model, behavior based on self-interested exogenous preferences and complete and costless contracting have recently come under critical scrutiny. First, social norms and psychological dispositions extending beyond the selfish motives of *Homo economicus* may have an important bearing on outcomes, even in competitive markets. Second, market outcomes depend on strategic interactions in which power in the political sense is exercised. It follows that economics must become more behavioral and more institutional. We can return to these themes of the classical tradition, now equipped with the more powerful mathematical tools developed over the past century.

I. INTRODUCTION

What do we know that a century ago Alfred Marshall did not?

Marshall's *Principles,* first published in 1890, became the "Samuelson" of an entire generation of English-speaking economists, and bristles with ideas anticipating late twentieth century economics. Marshall's text touches on increasing returns, now central to endogenous growth theory, the importance of nonselfish motives and other preferences that are unknown to *Homo economicus,* now staples of behavioral and experimental economics, and the relevance of the biological (rather than "mechanical") analogies, now key elements in the burgeoning field of evolutionary game theory.

But Marshall failed to make much of these modern ideas, and as the century progressed, his insightful but frumpy Victorian economics was supplanted by a more elegant and thoroughly continental Walrasian model that dropped them altogether. Two basic tenets of this model, behavior based on self-interested exogenous preferences and complete and costless contracting, underpin the distinctive analytical results of what came to be known as neoclassical economics. They also influenced the subject matter of "political economy," which soon was to drop the adjective and become "the relationship between given ends and scarce means . . ." to use Lionel Robbins [1935] famous phrase.

The reader who doubts the centrality of these tenets might

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consider, for instance, how different post-World War II textbooks would have looked if they had addressed, as the standard case, individuals with socially formed, and not always selfish, preferences, whose exchanges are governed by incomplete contracts requiring strategic interaction in markets that need not clear in competitive equilibrium.

The Walrasian assumptions about preferences and contracting have recently come under scrutiny, and now command less assent than in the days when the Marshallian variant of neoclassical economics was rejected in favor of Walrasian wisdom. We here explore recent contributions to economic theory that attempt to correct the weaknesses of Walrasian economics. The lack of realism of the complete contracting assumption is hardly in doubt, and we will do little more than mention the now familiar consequences of the failure of this Walrasian assumption, among them the fact that competitive equilibria may be Pareto-inefficient, and include credit-constrained borrowers and unemployed (or misemployed) workers unable to make the transactions they desire at the going rates of interest and wages. We will focus instead on some unexpected implications of abandoning the familiar terrain of complete contracts.

The first implication (Section II) is that where some aspect of an exchange is not subject to a costlessly enforceable contract, social norms and psychological dispositions extending beyond the selfish motives of *Homo economicus* may have an important bearing on outcomes, even in competitive markets. The second implication (Section III) is that market outcomes depend on strategic interactions in which something akin to "power" in the political sense is exercised. Where contracts are complete, as Oliver Hart remarked, there is nothing for power to be *about,* but where much remains to be determined after the handshake, the institutional details of the exchange process determine the strategic opportunities and effectiveness of the parties concerned. The result of these two consequences of incomplete contracts is that economic analysis must become more social and psychological in its treatment of the human actor, more institutional in its description of the exchange process, yet no less analytical in its model-building and no less dedicated to the construction of general equilibrium models. In Section IV we discuss the problem of public policy and institutional design, observing that we must judge policies and institutions not by how closely they approximate the assumptions of the fundamental theorems of welfare

economics, but rather according to their ability to function effectively in the second-best world of ineradicable state and market failures. Section V suggests that Walrasian economics was a detour, avoiding the hard problems in economic theory and failing to elucidate the central issues of policy and institutional design. We close with some thoughts on the challenge of acquiring and teaching the economists' craft.

II. Individual Behavior and its Evolution

In the opening pages of the *Principles,* Marshall dismissed the idea that economics should model the individual as a selfish calculating machine. "Attempts have been made," he wrote in the preface of the first edition, "to construct an abstract science with regard to the actions of an 'economic man' who is under no ethical influences and who pursues pecuniary gain warily and energetically, but mechanically and selfishly. But they have not been successful . . ." adding "nor even thoroughly carried out"—acknowledging that the economic man of neoclassical theory, although calculating and selfish, was also a perfect gentleman, for whom a handshake was a handshake and who thus would not consider behaving opportunistically by shirking on the job, defaulting on a loan, or otherwise taking advantage of contractual incompleteness, simply because it suited him to do so.

Instead of the abstract "economic man" of Walrasian theory, Marshall advocated empirically based assumptions concerning the heterogeneous but "regular" behaviors and cognitive orientations of members of distinct social groups (among which were women, about whom Marshall's views were anything but modern). He also stressed that these behavioral regularities are shaped by the economic circumstances under which they live and work. The third sentence of the *Principles* states that: ". . . man's character has been moulded by his everyday work and the material resources which he thereby procures more than by any other influence unless it be that of religion . . ." and later on the same page he adds an idea taken from Smith, that "his character is formed by the way he uses his faculties in his work, by the thoughts and feelings which it suggests, and by his relations to his associates in work, his employers or his employees." Subsequent generations, however, were ushered past these guideposts and offered an analytically more tractable but empirically ungrounded conception of human behavior. The economic man known to

students of Walrasian economics acts on the basis of preferences that are self-regarding—excluding such intrinsic values as altruism, fairness, and vengeance—and are defined over a restricted range of outcomes—excluding honesty as well as concerns about the *process* rather than simply the *outcome* of exchange per se.

This view has always had its critics, of course, from the sociological insights of Thorstein Veblen concerning conspicuous consumption through the attempts of James Duesenberry to explain consumption/savings patterns in terms of "keeping up with the Joneses," to John Kenneth Galbraith's notion that consumer tastes are created by advertising. Doubtless the most recognized of such critics is Herbert Simon, whose concept of "bounded rationality" has motivated considerable research in institutional economics, most notably in the work of Oliver Williamson. In addition, Armen Alchian [1950] and Gary Becker [1962] wrote pioneering papers on how what would now be called adaptive agents—namely firms and consumers with limited cognitive capacities—might give rise to competitive market outcomes similar to those of fully informed utility-maximizing agents.

Yet, until recently these critics induced few economists to go beyond the conventional notion of preferences in the Walrasian model. Human capital theory in the 1950s and 1960s, and the economics of education in the ensuing years, might have been the occasion for a sustained investigation of how social institutions shape preferences and human character. But the pioneers of this field preferred to leave the ancient *de gustibus non est disputandum* canon undisturbed. Our dissenting view, presented in Gintis [1972] and Bowles and Gintis [1975, 1976], had little impact within economics.

At an accelerating pace over the closing fifteen years of this century, however, an empirically grounded view of economic behavior—one increasingly subject to analytical modeling—*has* arisen to challenge the *Homo economicus* of the Walrasian model, amending and augmenting the conventional view, as it happens along the lines suggested by Marshall. The approach draws on insights and empirical results from biology, psychology, sociology, and experimental economics. We refer to the approach as "behavioral," for lack of a better term. The primary contribution of the behavioral approach to economics is to understanding the diversity and context-dependent nature of human preferences, how elements of this repertoire of preferences become salient in particular strategic interactions, how they have evolved over the

long run, and how individuals form the beliefs that along with their preferences explain what people do. The behavioral approach is not a critique of optimizing subject to constraints. It takes for granted that people are purposeful and have reasons for what they do—although it recognizes that individuals may have internal conflicts and time-inconsistent preferences. Rather, it challenges conventional accounts of the content and origins of preferences. Important early contributions here include Akerlof [1984], Tversky and Kahneman [1974], and Kahneman, Knetch, and Thaler [1986].

Everyday observation as well as introspection suggests that other-regarding and process-regarding preferences may be important in explaining behavior. Experimental evidence confirms these impressions. The commonly observed rejection of substantial positive offers in ultimatum games is an example. The ultimatum game pairs subjects (usually anonymously) one being randomly designated the "responder," the other the "proposer." The proposer is provisionally awarded a sum of money with instructions to divide it between proposer and responder. If the responder accepts the offer, the responder gets the proposed portion, and the proposer keeps the rest. If the responder rejects the offer, both get nothing. The prediction based on conventional preferences is, of course, that the proposer, knowing that the responder will accept any positive offer as preferable to nothing, will offer the smallest possible positive amount, which will be accepted.

But in experiments conducted in the United States, Japan, Israel, Europe, Russia, China, and Indonesia, the vast majority of proposers offer between 40 and 50 percent of the pie, and offers lower than 30 percent of the pie are often rejected [Camerer and Thaler 1995; Güth and Tietz 1990; Roth, Prasnikar, Okuno-Fujiwara, and Zamir 1991]. These results have occurred in experiments with stakes as high as three months' earnings, and they are unlikely to reflect subjects' misunderstanding of the game, as they have been replicated for repeated one-shot play. We have recently replicated these experimental results in a number of hunter-gatherer, pastoral, and other simple societies [Boyd, Henrich, Bowles, Fehr, and Gintis, forthcoming; Henrich, 2000].

The substantial offers made by proposers need not imply an ethic of fair division. They could be due to the prudence of self-interested proposers anticipating rejection of low offers. But self-regarding motives can hardly explain the respondents' com-

mon rejection of substantial offers. We are persuaded by the interpretation of these results as reflecting *strong reciprocity,* namely a propensity to reward those who have behaved cooperatively and correspondingly to punish those who have violated norms of acceptable behavior, even when reward and punishment cannot be justified in terms of self-regarding, outcome-oriented preferences.

Strong reciprocity is unlike the self-serving kindness of reciprocal altruism studied by biologists [Trivers 1971], popularized by the success of tit-for-tat in Axelrod's [1984] simulation tournaments, and embodied in cooperation-inducing "trigger strategies" in the theory of repeated games. The key difference is that strong reciprocity is not rewarded by higher payoffs in subsequent play and hence is not readily explained by outcome-oriented behavior. By contrast, reciprocal altruism, tit-for-tat, and cooperation in repeated games are fully consistent with conventional self-regarding preferences. Strong reciprocity also differs from the simple altruism studied by Becker [1981], Barro [1974], Hamilton [1975], and others, as it is conditional on the norm-observing behaviors of others. While unconditional altruism describes some observed behaviors among family members and intimates (although rarely of the complete form assumed by Barro and Becker) and it is sometimes extended to strangers, we find little evidence, experimental or other, of its generality as a robust and widespread motive among nonkin, especially by comparison with strong reciprocity.

Additional experimental evidence for the importance of strong reciprocity comes from public goods games in which subjects engage in costly punishment of noncontributors even on the final round of the game, where the possibly self-interested objective of improving the behavior of the slackers cannot be germane [Ostrom, Walker, and Gardner 1992; Fehr and Gächter 2000]. Corroborating evidence is to be found in sources ranging from descriptive accounts of collective action and vendettas to anthropological studies of norm enforcement in social groups lacking states, such as foraging bands [Boehm 1993].

A remarkable regularity in these experimental results is the substantial effect on subjects' behaviors induced by ostensibly irrelevant differences in experimental protocols. Hoffman and her collaborators varied two aspects of the experimental environment of the ultimatum game: proposers either won their position by doing well on a trivia quiz or were randomly assigned, and their

relationship to their game partner was either described as an "exchange" (with prices elicited by the experimenter) or simply as "divide $10" [Hoffman, McCabe, Shachat, and Smith 1994]. Despite the fact that the experimental situation was otherwise identical, the "earned status" plus "exchange" combined experimental condition protocol yielded significantly smaller offers. Blount [1995] found that respondent rejection rates fall dramatically when they are told that the offers are generated by a computer rather than a person, suggesting that the desire to punish a norm-violator, not simply rejecting a bad deal, is at work. The importance of context in cueing behaviors is further suggested by the fact that defection rates in the prisoner's dilemma game are substantially higher if the game is explained to subjects as the "Wall Street Game" rather than the "Community Game" [Ross and Ward 1996].

Economic behaviors are apparently strongly affected by what *Homo economicus* would consider irrelevant details. In some experiments, anonymity generates behaviors differing from those induced by more personal settings, even when the subjects are very unlikely ever to meet again. Communication, a reduction in social distance among experimental subjects, or other conditions contributing to group identity increases contributions in public goods games [Sally 1995; Ledyard 1995; Dawes, Van de Kragt, and Orbell 1988] and induces cooperative play in prisoner's dilemma interactions [Kollock 1997]. Gächter and Fehr [2000] find that in a public goods interaction even brief experimentally induced familiarity among subjects enhances the impact of social approval incentives. Combining familiarity and the public revelation of one's contributions leads to a significant increase in prosocial behavior.

Extending the behavioral foundations of economic theory cannot be done on the basis of experiments alone, of course. We do not know whether experimental results are robust indicators of behavioral traits in real world situations [Loewenstein 1999]. Do those who reject low offers in ultimatum games also vote for programs that would more equally distribute income? Are defectors in the prisoner's dilemma experiments less cooperative in the community or workplace? There is some evidence that experimental subjects who display trust in the laboratory also are more willing to engage in trusting behaviors in their daily lives [Glaeser, Laibson, Scheinkman, and Soutter 2000]. The experimental results are suggestive, however, in that they often document

behaviors that, if common in real life, would resolve widely recognized anomalies within the conventional preference paradigm. Included are such basic behaviors as voting, self-destructive revenge, and the vagaries of support and opposition among the well-off for income transfers to the poor [Fong 2000; Bowles and Gintis 2000].

It appears, then, that concerns about others and about the processes generating economic results—sometimes codified as ethical norms—are important sources of behavior, and that behavior is often context-specific. It follows that because economic institutions shape the structure of social interactions, they also differ in the types of situation-specific behaviors that they may motivate. Moreover, anthropological and social psychological evidence, some of it summarized in Bowles [1998], suggests that behavioral orientations are learned under the influence of economic institutions, are generalized to other noneconomic areas of social life, and persist from generation to generation.

Economic institutions shape preferences by influencing who interacts with whom, who performs which tasks, and with which behaviorally conditioned payoffs. As Gintis [1972] and Becker [1996] have stressed, individuals often deliberately alter their preferences, adopting the traits of their happier and more successful neighbors, for example. But in addition to such conscious processes, preference change often works sub rosa through psychological mechanisms of dissonance reduction or conformism. Examples include studies from both simple and advanced societies on the effects of the ways that adults make their living on child-rearing practices and values and on general psychological makeup [Barry III, Child, and Bacon 1959; Kohn 1969; Edgerton 1971; Kohn et al. 1990]. The importance of the nonintentional aspect of cultural updating differentiates our approach from Becker's [1996] valuable contribution on the deliberate alteration of one's preferences.

Those who doubt the importance of strong reciprocity sometimes claim that nonselfish human motivations could not have evolved under the influence of Darwinian natural selection, and hence are likely to be of limited importance. But while the evolution of a genetically transmitted altruism (the most studied case) is indeed unlikely, the skeptic's claim is uncompelling. First, preferences are the result of cultural as well as genetic inheritance and one can demonstrate that *prosocial traits* (i.e., traits that are nonselfish and promote the well-being of others) could

have evolved under the joint influence of cultural and genetic transmission [Boyd and Richerson 1985; Sober and Wilson 1998; Bowles 2000]. And second, highly developed human capacities for insider-outsider distinctions and cultural uniformity within communities greatly increase the likely importance of group selection of genetically transmitted traits and hence the evolutionary viability of group-beneficial traits. Indeed, for reasons presented in Bowles and Gintis [1998], it is plausible that strong reciprocity and the other behavioral orientations we have described could have evolved by this route.

This evolutionary approach to preferences sees human behavior as the result of individuals' adherence to behavioral rules that have proved successful by comparison with other behavioral rules and that as a result replicated and hence diffused throughout populations [Cavalli-Sforza and Feldman 1981; Boyd and Richerson 1985; Durham 1991]. The context-specific and diverse human behaviors we seek to understand are the result of the repertoires of these behavioral rules that have proved evolutionarily robust (which is not to say "socially optimal"). This approach displaces attention from cognitive and affective dispositions of individuals to the behavioral rules themselves and how they both replicate over time and combine in complicated ways to explain how people behave in particular situations.

III. Contracts and Social Structure

While Marshall's neglected endorsement of an empirically based approach to economic behavior now commands considerable assent, little in his writings, or for that matter in the writings of the founders of the Walrasian model, anticipates the modern theory of contracts. It is true, of course, that Marshall knew that a wage increase might increase worker effort—he used the term "efficiency wages"—but as with so many of his modern insights, he did not develop the theoretical ramifications of this fact. Walras showed even less interest in the strategic aspects of exchange, writing [Walras 1954 [1874]]: ". . . the pure theory of economics . . . resembles the physico-mathematical sciences in every respect. . . . Assuming equilibrium, we may even go so far as to abstract from entrepreneurs and simply consider the productive services as being, in a certain sense, exchanged directly for one another . . ." [pp. 71, 225]. Marshall and his contemporaries adopted the classical theory of contracts, according to which every aspect of

concern to one or more parties to an exchange is subject to a contract that is enforceable by a third party (the courts) at zero cost to the exchanging parties. The early neoclassical economists, and especially Marshall, did not ignore cases where markets were incomplete, as for example with environmental and training externalities. But they regarded as exceptional the fact that liabilities from environmental spillover, for example, are not generally subject to contractual compensation.

Ronald Coase [1937], by contrast, made incomplete contracts central to economics, noting that economic transactions take place within the firm when they can be effected at lower cost through hierarchical command, in which the employee carries out the employer's directives, rather than through a market exchange. Karl Marx had presented an analogous view of the capitalist firm a century before, distinguishing between what is contracted for (the wage) and the service delivered (the activity of work itself), which is not subject to contract but rather, as Marx put it, is "extracted" by the employer's exercise of authority. The verbal arguments of Marx and Coase were cast in analytical form by Herbert Simon [1951], thereby highlighting two serious lacunae in Coase's analysis: what determines who is the employer, and why should the employee obey the employer?

Armen Alchian and Harold Demsetz [1972] answered the first question by claiming that only the owner of the firm's assets, as residual claimant on the firm's income, has an incentive to monitor employee behavior, and hence must be the hierarchical superior. Stephen Marglin [1974] offered a famous alternative answer, in which the owner of capital assets must also control the production process in order to generate a flow of profits. Herbert Gintis [1976], Carl Shapiro and Joseph Stiglitz [1984], and Samuel Bowles [1985] answered the second by showing that if labor markets failed to clear, the employer could induce worker performance with the threat of dismissal, and conversely, when labor contracts take the form of long-term contingent renewal contracts, equilibrium unemployment can result even with competitive markets. Finally, Oliver Williamson [1984] expanded Coase's framework to handle a wide variety of contractual and institutional relations, including partnerships and nonprofit firms, vertical and horizontal integration, and a theory indicating which agents will fill the role of residual claimants in the firm.

Assuming that the reader is familiar with principal-agent and transactions costs models [Williamson 1985; Stiglitz 1987],

we will explore some broad implications of contractual incompleteness.

To fix ideas, consider a case where a principal P benefits from an action a, which is costly for an agent A to perform and about which information is either costly for P to acquire or cannot be used by P to enforce a contract. P often addresses the problem by offering A a payment in excess of A's reservation price, promising to renew the transaction in subsequent periods unless A's performance is found to be inadequate. If this should occur, the transaction will be terminated, and A will receive a reservation asset z, less valuable than v, the present value of the expected utility of having the transaction. The quantity $v - z$ may be termed an *enforcement rent,* as it is a payment above A's next best alternative, and along with the threat of termination it is used by P to enforce claims against A when these are not third-party enforceable.

These so-called *contingent renewal models* of principal-agent relationships generate competitive equilibria consistent with an economywide zero profit condition in which principals offer positive enforcement rents and agents perform a level of the action greater than they would choose in the absence of the threat. Models of this type have been applied to labor markets, credit markets, contracts for residential and agricultural tenancy, and the exchange of variable quality goods, among others [Gintis 1976; Calvo 1979; Stiglitz and Weiss 1981; Shapiro and Stiglitz 1984; Bowles 1985; Banerjee and Ghatak 1996]. In these cases, markets do not generally clear in equilibrium, and one side of the market is quantity constrained—some agents are unable to secure the level of transactions they would prefer under the going terms. The quantity constrained may be either suppliers (workers, for example, in the case of the labor market) or demanders (borrowers in the case of the credit market).

While modeling strategies differ, a large class of similar approaches supports two conclusions. First, those on the short side of the market—employers and lenders in these examples, who are *not* quantity constrained—advance their interests by using the credible threat of a sanction to alter the behavior of the quantity-constrained agents on the long side of the market. Short siders can in this sense be said to exercise *short-side power* over the long siders with whom they interact.

Second, the exercise of short-side power is generally Pareto-improving, since both parties are better off than in a situation in

which principals are constrained to offer agents contracts equal to their next best alternative. But the resulting equilibrium is Pareto dominated by an outcome in which the agent provides more of the noncontractible service to the principal and the principal provides a higher payment. Of course, this Pareto superior outcome is not feasible unless the information and incentive structure of the problem can be altered, as it may, for example, by collective bargaining, cooperative workplace practices (the handshake), or redistribution of property rights, a possibility to which we will return in the next section.

This approach casts new light on the relationship between wealth and power, and allows a more satisfactory understanding of why the wealthy not only have ample budget sets (purchasing power) but frequently direct the actions of others through commands. We are not here concerned with the political influence of the wealthy or the fact that owners of firms in highly concentrated industries may alter prices to their advantage (market power). Rather, our point is that the wealthy have power (in the sense defined above) because they tend to be located on the short side of nonclearing markets: as lenders in credit markets and as employers in labor markets—employers are more likely to be wealthy because lack of wealth generally precludes access to funds on terms consistent with survival in business.

The fact that *power may be exercised in competitive equilibrium* provides a valuable link between the process of exchange and the exercise of authority. In the quite different markets versus hierarchies approach pioneered by Williamson, the exercise of authority is a nonmarket phenomenon—attributable to the structure of organizations. But the contingent renewal model shows it to be a consequence of the ways the organizations and markets interact. If markets cleared and hence enforcement rents were zero, then, barring specialized ad hoc assumptions, individuals would be unconcerned about the prospect of termination, so sanctioning would be impossible no matter how "hierarchical" the organization. The phenomenon of short-side power, by contrast, explains why those in authority in firms may reasonably expect to be obeyed, namely because they are in a position to deprive the employee of a substantial enforcement rent, even where no transaction-specific assets are involved. It thereby resolves what we call the *puzzle of obedience* thrown up by the Coasian theory of the firm.

Suitably elaborated models of this type provide a compelling

account of many aspects of modern economies, going some way to make sense of empirical regularities that are anomalous, or are resolvable only at the cost of ad hoc reasoning, in the Walrasian model. The empirically observed inability of the unemployed to underbid the employed and to drive wages to market-clearing levels, the covariance of real wages with the level of employment, the high-employment profit squeeze, and the end-of-expansion productivity slowdown are standard predictions of the incomplete contracting models while less readily explained within a complete contracting framework [Bowles, Gordon, and Weisskopf 1983; Bowles, Gordon, and Weisskopf 1989; Blanchflower and Oswald 1994].

It has been objected, however, that if enforcement rents were substantial, principals could profit by charging an up-front fee for the right to transact with them (e.g., Carmichael [1985]). Employers, for example, would charge prospective employees a fee sufficient to make them indifferent to *taking* the job, but not indifferent to *losing* it once the fee had been paid (the ex ante rent is thus zero, appropriated by the employer, but the ex post rent remains, and the threat of its removal continues to motivate the employee). The fact that such fees, or their surrogates such as steep tenure-earnings profiles, are not widespread is taken to mean that models of the contingent renewal type are flawed.

While it is possible to model contingent renewal and bonding assuming agents have self-regarding preferences over outcomes [Dickens, Katz, Lang, and Summers 1989; MacLeod and Malcomson 1993], we think that the behavioral approach provides a more compelling explanation. Jobs are not sold because doing so would violate the norms of reciprocity and incur retaliation on the part of workers in the form of reduced effort or care. In experimental labor markets "firms" offer wages well above the supply price of "workers," and the latter then choose to incur a cost of effort well above the minimum, even in one-shot interactions. In these experiments the few "firms" embracing the simplistic view of *Homo economicus* assume that "workers" will perform the minimal effort in any case and hence offer them the minimal wage [Fehr and Falk 1999; Gächter 1998]. These "firms" do poorly compared with those relying on strong reciprocity. Moreover, even when a labor market is operative in such laboratory experiments, reciprocity and gift exchange produce an equilibrium that is far from market clearing [Fehr, Gächter, Kirchler, and Weichbold 1998b; Fehr, Kirchsteiger, and Riedl 1998]. Wage setting therefore

appears to reflect the importance of reciprocity norms, once summarized in the phrase "a fair day's work for a fair day's pay."

We mention the job fees objection not only because it is important but because it indicates a complementarity between the agent-based economists' reconsideration of preferences and modern contract theory. The symbiosis is not accidental. The theory of incomplete contracts suggests that spot markets among anonymous actors will fail to solve incentive problems where longer term interactions may succeed. But the durable face-to-face interactions that result from long-term contracting are precisely the kinds of social situations shown to evoke the behavioral motives that the *Homo economicus* fiction assumes away. Siamwalla's [1978] study of the rice and raw rubber markets in Thailand, for example, found long-term trust-based exchanges where quality variations make contracts incomplete (in rubber) but anonymous relations where quality is easily determined and complete contracts were therefore possible (in rice). Similarly, Kollock [1994] found that trust and commitment evolve in experimental exchanges with unobservable and noncontractible quality differences in the goods, but not when quality is given.

The incomplete contracting framework thus provides a setting in which issues not only of efficiency, but also of fairness, trust, and reciprocity (long stressed by sociology's theory of social exchange) arise, and where the beliefs and preferences of employees—their views on fairness, the extent of their identification with the organization or their degree of solidarity with other employees—may, like employees' skills, influence the wage-setting process [Blau 1964; Solow 1990; Bewley 1995]. The complementarity between the theory of incomplete contracts and behavioral approaches to preferences is demonstrated clearly by the fact that experimental markets with complete contracts quickly converge to the equilibria predicted by the conventional theory [Smith 1982], while experimental markets with incomplete contracts (such as those described above) generally exhibit behaviors that are anomalous in the conventional paradigm. Indeed, it is precisely the social preferences revealed in these experiments that sometimes allow individuals to surmount the obstacles of contractual incompleteness to exploit mutually beneficial gains from trade. Arrow long ago stressed this connection: "In the absence of trust . . . opportunities for mutually beneficial cooperation would have to be foregone . . . norms of social behavior, including ethical

and moral codes (may be) . . . reactions of society to compensate for market failures" [Arrow 1971, p. 22].

IV. Economic Policy and Institutions

Contrary to the claims of many of its critics, Walrasian economics never had a policy agenda. From Walras to the present, the policy positions of its leading exponents ranged from a confidence in the ability of government to implement a social optimum, without markets, by a state functionary acting as the Walrasian "auctioneer" on the one hand, to an equally unbounded faith in the ability of markets to achieve a social optimum without state intervention on the other. While policy debates still occasionally turns on this dichotomy, there have been important advances in the study of economic institutions and policy since Marshall and Pigou inaugurated welfare economics in the 1930s.

First, market failures and state failures are now analyzed in a common framework rather than from competing viewpoints, due to development in information economics, and especially the modeling of relations between principals and agents. Moreover, public choice theory has given us a unified approach covering the actions of government officials and market actors alike. As a result, the state is no longer the exogenous instrument wisely implementing some concept of social well-being, and attention has shifted from *picking the right policy, to setting up the right rules* so that the imperfect interplay of incentives of all the relevant actors will support socially desirable, if not optimal, outcomes.

This common framework, as well as a century of historical learning, from the Great Depression and the fall of Communism, has dashed utopian assumptions. Many are now convinced that John Stuart Mill's injunction that we must devise rules such that the "duties and the interests" of government officials would coincide should be shelved in the museum of utopian designs, along with the assumptions of the Fundamental Theorem of Welfare Economics. Most modern economists see both market failures and state failures as common rather than exceptional. Further, market failures are no longer considered *curiosa* having to do with bees and lighthouses, but occur in the major markets of a modern economy, namely credit markets and labor markets. Thus, markets and states are now seen not as *competing* but as *complementary* institutions in the quest to "get the rules right," and many formulations see a broader range of institutions of

economic governance as essential in this task, including small-scale communities—neighborhoods, nongovernmental associations, and the like—as well as families [Hayami 1989; Ostrom 1990; Aoki 1995; Taylor 1996].

Second, policies and institutions are no longer evaluated as though preferences are exogenous. David Hume [1754 (1898), p. 117] thought that "in contriving any system of government . . . every man ought to be supposed to be a knave and to have no other end, in all of his actions, than his private interest." Generations of economists believed that the right institutions—notably well-defined property rights and competitive markets—could meet Hume's challenge. But economists are now turning their attention to the ways in which institutions and policies can not only harness self-interested motives, but also evoke other-regarding motives and influence individual preferences in socially desirable ways.

Discussions of policy measures addressed to crime, the environment, schooling, discrimination, and welfare reform now commonly treat *preferences as endogenous,* as do studies of the impact of markets and other modern institutions on indigenous cultures [Becker 1996; Kahan 1997; Bowles and Gintis 2000]. Attempts to enhance what is widely (and vaguely) termed social capital reflect this new way of thinking. The theory of implementation—which conventionally has sought policies to implement socially desirable outcomes as Nash equilibria where agent's preferences are given—must now consider the effects of the policies on the preferences, with an equilibrium now requiring stationarity of preferences as well as individual actions.

Third, the economist's canonical desire to separate the issues of distribution from those of efficient allocation—dating back to Mill—now seems quixotic. The separation is formalized in the Fundamental Theorem's affirmation that (under suitable assumptions) any Pareto-optimal distributional outcome can be achieved through an appropriate choice of initial endowments followed by Walrasian exchange. But recent research in credit and labor markets as well as other principal-agent relationships identifies violations of the Fundamental Theorem's complete contracting assumptions indicating that wealth endowments may have substantial effects on allocative efficiency [Loury 1981; Stiglitz 1994; Aghion and Bolton 1997; Laffont and Matoussi 1995; Bénabou 1996; Banerjee and Ghatak 1996; Hoff and Lyon 1995]. The reason is that the incentives, sanctions, and other contractual provisions that may be deployed in any particular exchange depend on the

wealth level of the parties to the exchange, and an agent's lack of wealth—by a sharecropping farmer, a wage employee, or a residential tenant for example—may preclude the use of efficient contracts [Bardhan, Bowles, and Gintis 2000].

These cases are policy relevant where it is possible to devise redistributive strategies that are implementable in the above sense, and improve the contractual environment by making agents residual claimants on the consequences of their noncontractible actions. Examples include insurance and credit market policies to allow the wealth-poor to overcome their limited ability to borrow and to bear risk and thus to acquire productive assets. While the importance of the incentive costs of poorly designed egalitarian redistributive programs is in no way diminished, these results do suggest the existence of a class of egalitarian wealth redistributions that may improve allocative efficiency. If so, the canonical efficiency equity trade-off—whose ineluctable logic is given prominent place in most introductory texts—may be up for reconsideration.

V. The Walrasian Detour

In retrospect, the Walrasian model, with its canonical assumptions—complete contracting and the conventional preferences of *Homo economicus*—was an intellectually exciting detour whose glamour hid the fact that it cast little light on the time-honored questions of economic institutions, policy, and the wealth of nations. Many economists believe that the canonical Walrasian assumptions are the unavoidable price to be paid for clarity and rigor in more abstract reasoning, while accepting that more empirically grounded assumptions should inform practical investigations in particular applied topics. Others recognize that the time may have come to reconsider the Walrasian approach and its assumptions, but regard it not as a detour but as having provided essential foundations for our current knowledge. We disagree with both views. We need different (but not necessarily fewer) abstractions, and we need not have taken the circuitous Walrasian route to the present.

Our view that the Walrasian model is wrong not in the details but in its basic abstractions is suggested by its inability to cast light on such fundamental questions as the recent contrasting growth trajectories of China and Russia or of the smaller East Asian economies and those in Africa and Latin America in the

1980s and 1990s. But let us consider an equally telling failure: its surprising inability to understand the shortcomings of the main competitor to capitalism in this century, state ownership and central planning. The basic problem with the Walrasian model in this respect is that it is essentially about allocations and only tangentially about markets—as one of us (Bowles) learned when he noticed that the graduate microeconomics course that he taught at Harvard was easily repackaged as "The Theory of Economic Planning" at the University of Havana in 1969.

The Walrasian model is often taken to justify the private-ownership market economy. But in fact, as Oskar Lange and others demonstrated in the famous "planning versus markets debate" with Hayek and other supporters of *laissez-faire* capitalism in the 1930s, these principles can just as easily be used to justify the social ownership of property and the control of the economy by the state [Lange and Taylor 1938; Schumpeter 1942]. Indeed, the Fundamental Theorem asserts that *any* pattern of ownership is compatible with economic efficiency, as long as prices are chosen to equate supply and demand.

Lange pointed out that markets and private property play a purely metaphorical role in general equilibrium theory. There is no competition in the sense of strategic interaction, since *agents never meet other agents and agents do not care who other agents are or what they are doing.* The only factors determining individual and firm behavior are prices. Nor do markets have any function in the Walrasian model. In Walras' original description, market clearing was not effected by markets at all, but rather by an "auctioneer" who assumed that all economic agents revealed truthfully their personal knowledge and preferences. Thus, prices need not be set by market interactions or any other particular mechanism. From the standpoint of the Walrasian model, a central planner could play the part of Walras' auctioneer, setting prices to clear markets in a manner that is perfectly compatible with economic efficiency. Moreover, to this day no one has succeeded in producing a plausible decentralized alternative to the auctioneer—for instance, a dynamic model of market interaction in which prices move toward their market-clearing levels. We contrast this with contemporary agency theory, in which in the absence of complete contracting, informational asymmetries are key impediments to economic efficiency, and competitive interactions play a central role in revealing private information.

Thus, it is hardly surprising that Lange and the other

socialist economists won the academic debate of the 1930s. Joseph Schumpeter's classic *Capitalism, Socialism and Democracy* [1942], in which this staunch supporter of capitalism predicts its imminent demise, is perhaps the greatest tribute to the socialist intellectual victory. "Can socialism work?" Schumpeter asked. "Of course. . . . There is nothing wrong with the pure theory of socialism" [pp. 167, 172].

The late-classical (and socialist sympathizer) contemporary of Marx, John Stuart Mill [1976, pp. 115–136] had more to say about the incentive and information problems of socialism than did the conservative neoclassical Schumpeter. Hayek himself apparently concluded that it had been a mistake to conduct the debate in Walrasian terms, and in the late 1930s and early 1940s developed the analytical foundations of a more plausible Austrian alternative to the Walrasian model [Hayek 1945]. In a footnote to this paper Hayek claims that "Professor Schumpeter is . . . the original author of the myth that Pareto and Barone have "solved" the problem of socialist calculation." Hayek's appreciation of the importance of information allowed him to pinpoint a decisive weakness of central planning unavailable to the Walrasian economist, namely the planners' inability to acquire the information necessary to determine socially efficient prices. Recent approaches using principal-agent models have illuminated other socialist shortcomings obscured by the Walrasian model. Summarizing these insights, Joseph Stiglitz [1994, p. 10] wryly observed, "if the neoclassical model . . . were correct, market socialism would have been a success [and] centrally planned socialism would have run into far fewer problems . . ."

The record of the Walrasian model is no better in explaining the wealth and poverty of nations and people. But did it not lay the foundations for a more adequate approach? Perhaps the full development of the Walrasian model was a necessary precondition for developing analytical models of incomplete contracts and broader models of human behavior. Perhaps such modern notions as costly contracting, asymmetric information, endogenous preferences, and strategic interaction were widely appreciated by neoclassical economists, but they lacked the tools to model such phenomena. But the founding contributions to incomplete contracts, game theory, and behavioral economics did not await the development of the Walrasian model. Rather, the foundations of a non-Walrasian approach laid down by prominent economists in the period from 1937 to 1957, precisely the period in which the

Marshallian paradigm was displaced by the nascent Walrasian paradigm, subsequent to which two generations of economists were taught Walrasian general equilibrium as the core of modern economic theory. Ronald Coase's seminal analysis of the interplay of market exchange and hierarchical command appeared in 1937 ("The Nature of the Firm"), and F. A. Hayek clearly expressed the problem of incomplete information in his 1945 *American Economic Review* article, "The Uses of Knowledge in Society." John Nash's solution concept appeared in *Econometrica* in 1953, and R. Duncan Luce and Howard Raiffa's quite sophisticated *Games and Decisions* was published in 1957. Finally, Herbert Simon's "A Formal Theory of the Employment Relation," appeared in 1951, and his *Models of Man* in 1957. In short, all of the underpinnings of a non-Walrasian economics had been set in place by 1960. Walrasian economics was not the precondition of these innovations—it was their competition.

Most neoclassical economists in the postwar period were actively hostile to broader models of human behavior and to introducing strategic interaction into economic theory. We do not recall our teachers bringing these issues to our attention in the early 1960s, and when some years later, Becker and Stigler wrote their famous paper [1977], we do not recall any of the greats disputing the assertion that "de gustibus non est disputandum." None of these ideas made it into the curriculum—not even, Bowles recalls, when he cotaught the graduate Ph.D. microeconomics course with Tibor Scitovsky, whose subsequent *Joyless Economy* would mount a compelling critique of the behavioral assumptions of economics. When Gintis used Coase, Simon, and Marx to challenge exogenous preferences—the relevant portion eventually appearing as Gintis [1972]—Paul Samuelson singled out this work for criticism in his 1970 Nobel Prize speech in Stockholm. In response to the proposal that a notion of power be introduced into economic theory, Abba Lerner [1972, p. 259] responded by saying "An economic transaction is a solved political problem. Economics has gained the title of Queen of the Social Sciences by choosing solved political problems as its domain." Lerner went on to explain that third-party enforceable contracts make the exercise of power irrelevant.

Our preferred explanation of the Walrasian Detour involves a confluence of forces. Perhaps most important, midcentury neoclassical economists, while aware of the degree of abstraction of their model of the economy, believed that transaction costs, asymmetric

information, endogenous preferences, and the like, were of minor importance in a competitive economy, and were accustomed to treating unemployment, inertial prices, the business cycle, credit rationing, and similar phenomena as disequilibrium phenomena explicable by Keynesian and other short-term models. Moreover, they doubtless expected "normal science" to add such elements of realism to their models, just as they expected a reasonable treatment of the stability of general equilibrium to emerge. If this is what they expected, they were wrong. The reader might complain that we do an injustice to Walrasian theory by not recognizing the strides taken in recent years in modeling incomplete contracts (see Magill and Quinzii [1996], Geanakoplos and Polemarchakis [1996], and the references cited therein). However, these contributions deal almost exclusively with *financial* markets, whereas our concern is with the portrayal of *real* markets in general equilibrium theory. Here there have been few contributions that model strategic interaction within a general equilibrium setting.

The absence of such developments, as well as the collapse of the Keynesian paradigm in the late 1970s, suggested to a younger generation of economists that the Walrasian model should be taken with a grain of salt. Thus, while during the 1960s and 1970s only a few economists developed the insights of Coase, Simon, Nash, and other midcentury forerunners (among them Kenneth Arrow, Gary Becker, Armen Alchian, Harold Demsetz, Joseph Stiglitz, and Oliver Williamson), in the 1980s and 1990s the trickle of post-Walrasian models swelled to a flood. It is too early to treat these heterogeneous contributions, some of which we have summarized above, as a new paradigm, but the return from the Walrasian detour has already yielded important insights.

As we have seen, principal-agent models of the employment relationship, together with gift-exchange explanations of the absence of bonding, explain the widely observed excess supply of labor in equilibrium—including open unemployment and a general excess of agents competing for desirable career-enhancing positions. Second, they provide a plausible account of why centrally planned economies eventually failed, one stressing information asymmetries in principal-agent relationships. Third, they provide a reasonable, if not fully documented as yet, account of why the relationship between equality and efficiency (or productivity growth) may be of either sign, in contradiction to the conventional trade-off. Fourth, Walrasian models have difficulty explain-

ing why *Homo economicus* would vote and what he votes for when he does. For example, there are significant levels of support for redistributive expenditure among people who are sufficiently rich that they do not anticipate becoming recipients of programs that they support. By contrast, behavioral models explain such phenomena by demonstrating that under a variety of conditions (e.g., in the Dictator Game often studied by experimentalists) economic actors choose to share gains with other, even unrelated and unknown, individuals. Finally, these models allow a natural representation of markets as disciplining devices, an aspect of markets that is obscured in Walrasian reasoning. In the modern approach [Hölmstrom 1979, 1982], by contrast, firm managers have private information concerning their behavior that they can be induced to provide to outsiders—firm owners, consumers, and government—in a least-cost manner by rewarding them according to their relative success in a competitive framework. Similarly, the disciplinary nature of markets gives us a much richer theory of consumer sovereignty based on the notion of endogenous quality enforcement, which implies that consumers have short-side power in dealing with their suppliers, much as employers have short-side power in dealing with their employees [Gintis 1989; Bowles and Gintis 1993].

VI. Conclusion: The Economist's Craft

The intellectual and practical lessons of the twentieth century have enriched the discipline, but also immeasurably complicated the task of becoming a good economist, or learning the economist's *craft.* After decades of Walrasian respite, complex institutions and multifaceted people again intrude on our thinking, forcing a retreat from the elegant but misleading abstractions that once monopolized economic theory.

Recent decades have seen a significant increase in economic inputs and outputs that are difficult to contract for—quintessentially information, but services more generally, forcing incomplete contracting and strategic interaction to center stage. Moreover, economists are increasingly concerned with social problems reflecting dimensions of human behavior and well-being that are not captured by conventional models of "economic man," and hence for which *Homo economicus* offers a limited and sometimes misleading basis for social policy. Among these are the management of common pool resources, the nature and value of social capital,

crime, addiction, discrimination, risky behaviors, and welfare dependency. These new interests are partially due to Gary Becker's influence, but doubtless more important, economists are increasingly called upon to offer economic advice in these areas, where the limitations of *Homo economicus* as a model of behavior are particularly transparent.

Partly as a result of these changes, many economists have shifted their attention from markets in general to the peculiarities of particular markets, each governed by distinct rules and evoking particular behavioral responses from their participants. This move returns us to Marshall, who was the last great nineteenth century economist to attend to the particularities of human motivations and institutions. Increasing recognition of the importance of positive feedback effects and generalized increasing returns—in areas such as growth divergence among nations, neighborhood effects, and technological lock-ins—has motivated a concern with the multiplicity of equilibria and the likelihood that many outcomes are path dependent [Arthur 1994; Durlauf 1996]. As a result, contemporary economic history may exhibit an interplay of local uniformity coupled with global institutional and behavioral diversity rather than global convergence and uniformity [Young 1998].

As a consequence, the economist's craft has been transformed in two ways. First, the disciplinary boundaries between economics and the other behavioral sciences, including biology, as well as history, now appear more to impede rather than promote learning. Behavioral economics draws on all of the social sciences and biology as well, and the modern theory of contracts is hobbled without the insights of political science, sociology, and social psychology. The reader may wonder why we do not just pack up and become sociologists. The answer, we think, is that the distinctive strengths of economics—explaining prices and quantities, as well as exploring the complex and often unexpected ways that countless uncoordinated actions generate sometimes unanticipated aggregate outcomes and dynamics—is no less relevant today than when it was pioneered by the classical economists two centuries ago. The inadequacy of *Walrasian* general equilibrium in no way diminishes the importance of general equilibrium thinking.

Second, taking account of the institutional and behavioral peculiarities defining a problem, as well as the possibility of many equilibrium outcomes, often requires close attention to empirical

details that were abstracted from in the Walrasian approach. We suspect that continuing progress in economic theory will draw more heavily on historical, econometric, and experimental data for the simple reason that we may be encountering sharply diminishing returns in generating valuable insights from just a few abstract assumptions about behavior and institutions. Knowing a lot about how some part of the economy actually works or about some aspect of economic behavior may provide both a stimulus to good theory and a valuable discipline to theory building.

The imperative for a more multidisciplinary and empirically based knowledge has obvious implications for the recruitment and education of the next generation of economists. The discrepancy between these imperatives and the common practice of graduate and undergraduate education in economics hardly needs to be pointed out.

We have stressed progress in economics over the past century, but there is much that we have not learned. Over a century ago in the opening pages of his *Principles,* Marshall defined one of the chief tasks of our discipline this way:

> Now at last we are setting ourselves seriously to inquire whether it is necessary that there should be any so called "lower classes" at all: that is whether there need be large numbers of people doomed from their birth to hard work in order to provide for others the requisites of a refined and cultured life; while they themselves are prevented by their poverty and toil from having any share or part in that life . . . the answer depends in a great measure upon facts and inferences, which are within the province of economics; and this is it which gives to economic studies their chief and their highest interest [1930 (1890), pp. 3–4].

We suspect he would be disappointed in what economics has accomplished toward this end over the intervening century, particularly if he considered the poor and low paid workers throughout the world. That governments resist economic advice can hardly be the reason, for there is all too much evidence that they avidly implement policies designed by economists—whether interventionist or market-based—sometimes with disastrous consequences. Economics is still far from mastering the problem of alleviating poverty and providing economic security for the least well off, although it is closer today than when Marshall wrote.

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