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$$\frac{3}{P-Z}$$

Paradoxical results such as these merely highlight the fact that we still have a great distance to go in understanding the relation between rational behaviour and knowledge.

KAUSHIK BASU

See also COMMON KNOWLEDGE; CONVENTIONS; GAME THEORY AND STATES OF THE WORLD; PRISONERS' DILEMMA.

Subject classification: 1d(i).

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Pareto optimality. The Italian economist and sociologist Vilfredo Pareto (1848–1923) was, along with F.Y. Edgeworth and Leon Walras, one of the great originators of the economic theory of general equilibrium. Pareto's education was in mathematics, physical science and engineering; he worked for many years for railroad and iron-works companies. Around 1890 he developed an interest in applications of mathematics to economic science. By 1892 he had accepted the chair of political economy at the University of Lausanne, previously occupied by Walras, and he had completed his transformation from engineer into social scientist.

Pareto left two contributions to economic science that bear his name. One is an empirical result regarding the distribution of income, a relatively simple exponential distribution formula now known as Pareto's law. The second contribution, and the subject of this article, is now known as Pareto optimality.

The notion of Pareto optimality had been anticipated by F.Y. Edgeworth in *Mathematical Psychics* (1881). In his discussion of the 'contract curve' of an exchange economy, Edgeworth describes an equilibrium as a state in which 'the utility of any one contractor must be a maximum *relative* to the utilities of the other contractors being constant, or not decreasing' (1881: 27). This is essentially equivalent to Pareto's definition, as we will see below.

However, it is first necessary to comment on the idea of utility. Edgeworth is a utilitarian. For him, economics 'investigates the arrangements between agents, each tending to his own *maximum* utility . . . and (Utilitarian) Ethics investigate[s] the arrangements which conduce to the *maximum* sum total of utility' (1881: 6–7). The problem is that, unlike the physical scientist, the utilitarian social scientist has difficulty measuring units of utility that are comparable between agents. But like the utilitarians before and after him, Edgeworth believes that this problem of 'hedonimetry' can be solved. We need only accept as an axiom that 'Any just perceivable pleasure-increment experienced by any sentient at any time has the same value' (1881: 101). Utility increments can be measured over time and over people, and summed overall. A moral calculus requires the comparison of 'the happiness of one person with the happiness of another, and generally the happiness of groups of different members and different average happiness. Such [a] comparison can no longer be shirked, if there is to be any systematic morality at all' (1881: 7–8).

Pareto read Edgeworth, and even more important, read and absorbed Walras's model of general economic equilibrium. In his *Manuel d'Économie Politique* (1906) and his

encyclopedia article 'Économie Mathématique' (1911), Pareto lays out his own general equilibrium model, which incorporates the crucial equilibrium notion now known as Pareto optimality.

The model of the *Manuel* (especially its mathematical appendix) describes individuals – consumers – who wish to consume certain goods and exchange other goods, and firms – producers – who seek to obtain maximum profits. An equilibrium for a consumer is a point on the highest feasible indifference curve, one 'where his tastes will be best satisfied' ([1906] 1971: 131), or one where his *index of ophelimity* will be greatest. (Note that this page reference and the ones below are to the English translation of the 1927 French edition of the *Manuel*.) Pareto's notion of 'index of ophelimity' for a consumer is akin to Edgeworth's utility, except for the crucial difference that it need not be objectively measurable or comparable between individuals. That is, it is what modern economists would call an *ordinal* utility function, not a cardinal function. It simply reflects *preferences*, not strength of feeling. An equilibrium for a producer is the highest point 'possible on the hill of profit' ([1906] 1971: 133). An equilibrium overall is one where consumers are maximizing their indices of ophelimity and simultaneously producers are maximizing profits.

The ordinal nature of Pareto's index functions merits further comment. He notes in the *Manuel* that if it were possible accurately to measure pleasure, such pleasure functions would serve as the index functions in his model. But, in fact, 'there is no need to measure pleasure; it suffices to have functions which increase when the pleasure increases, and decrease when it decreases. Besides, no one has been able to succeed in demonstrating that pleasure can be measured . . .' ([1906] 1971: 484). In his *Encyclopédie* article he goes further: 'The indices which relate to different individuals are heterogeneous quantities and there can be no question of adding them, nor of finding the maximum of a sum which does not exist' ([1911] 1955: 65).

The maximum welfare for the collectivity, or what Pareto calls maximum ophelimity, is a point 'from which it is impossible to move a very small distance, in such a way that the ophelimities of the individuals, except for some which remain constant, all increase . . .' ([1906] 1971: 452). In other words, it is a point from which no move can be made that would increase the welfare of some individuals and make no one worse off. This is the notion that is now known as *Pareto optimality*. (Note, however, that Pareto's own maximum ophelimity notion is defined locally – 'impossible to move a very small distance . . .' – whereas the modern usage makes Pareto optimality a global criterion, with no 'small distance' restriction.)

What Pareto does with his notion of optimality is to demonstrate what is now known as the first fundamental theorem of welfare economics: If all the agents in the economy take prices as given, an equilibrium must be a point of maximum ophelimity. That is, it must be Pareto optimal. Moreover, the conditions for an equilibrium and the conditions for maximum ophelimity are generally one and the same, so an optimal socialist economy must satisfy the same set of equations as an optimal market economy. This is an early version of what is now known as the second fundamental theorem of welfare economics. (See

Allais 1968 and, for a definitive modern analysis of an economic equilibrium, see Debreu 1959.)

It is important to note that the essential ideas of the first fundamental theorem can be traced back to Adam Smith and other classical economists, who argued that the 'invisible hand' ([1776] 1937: 423) of the market will lead to the greatest national wealth. With certain exceptions, Smith maintained that government should leave every man 'free to pursue his own interest in his own way' (ibid.: 651), and that such a policy of economic liberty will promote the public interest of maximizing the total value of what is produced by society. In classical economics, economic liberty maximizes wealth. In utilitarian economics, what should be maximized is the sum total of all utilities, and the policy that achieves this might be activist and complicated. In Paretian economics, an economic equilibrium, where agents are price-taking ordinal utility or profit maximizers, is Pareto optimal.

'BEST' AND 'BETTER', VIRTUES AND VICES. At this point I have described three economic notions of what is 'best'. For a classical economist, what is best is that which maximizes society's wealth. For a utilitarian economist, what is best is that which maximizes the sum total of the (cardinal and interpersonally comparable) utilities of all of society's members. For a modern economist, what is best is that which is Pareto optimal, that is, that which is undominated in the vector-space of (ordinal) utilities. (A utility vector $u = (u_1, u_2, \ldots, u_n)$ is 'undominated' if there does not exist another feasible utility vector $v = (v_1, v_2, \ldots, v_n)$, such that $v_1 \geq u_i$ for all i, and $v_i > u_i$ for some i. Note that the subscript i indexes persons 1 through n. Moving to such a v, if it existed, would make some people better off and make no one worse off.) There are many other philosophical, sociological and legal notions of what is 'best', but these are the dominant ones in economics.

Each of the three notions of 'best' has virtues and vices. The virtue of wealth maximization is its practicality. We feel we can measure money and wealth; in fact, we do it all the time. There are two vices. First is its neglect of distributional fairness. Wealth may be maximized, but the state of society that maximizes overall wealth may create grinding poverty for some. Second, although wealth appears easily measurable, changes in wealth may be difficult or impossible to measure in a logically consistent way.

To illustrate these difficulties, assume there are two (or more) goods that people care about. (If there is only one good, called 'money', there are no logical problems in aggregation.) For instance, suppose that in situation A, society has in total two pints of ale and three loaves of bread. Now suppose prices of both pints and loaves double. We all know we must not conclude that society's wealth has doubled; it has stayed constant. So to measure wealth properly, we must account for inflation, or 'normalize' prices in some way. (Pareto does this in the same way as Walras, by choosing a 'numeraire' good whose price is set at 1.) Now suppose situation B involves totals of three pints and two loaves. Has wealth increased or decreased? There are more pints, but fewer loaves. Whether or not wealth has increased depends on the relative prices of ale and bread, and, as Pareto was aware, those

prices depend on both (a) the ordinal utilities, or preferences, of the members of society, and (b) the distribution of goods among members of society. So, in truth, the definition of wealth itself actually *depends* on utility functions, and on distributions. As it turns out, a claim that society's aggregate *wealth* is maximized is as logically shaky as a claim that society's aggregate *utility* is maximized. (See, for instance, Samuelson (1950).)

The virtue of aggregate utility maximization has to do with its moral appeal. Many people are attracted to the notions that (a) what should matter is people's happiness, and (b) your happiness and my happiness should be equally important in the calculus of the social good. The vices start with the fundamental one noted by Pareto, the impossibility of measurement of an individual's utility level and the resulting meaninglessness of adding together non-comparable utilities of different individuals. It will soon be a century since Pareto noted that utility cannot be objectively measured, and there is still no measure. Other vices of the utilitarian approach will be mentioned below.

With respect to Pareto's notion of best, the idea of Pareto optimality, there are also virtues and vices. One virtue is found in the first fundamental theorem of welfare economics, according to which, in an economy whose agents are price takers, the equilibrium – what we now call a competitive equilibrium – must be Pareto optimal. That is, in a sense Pareto optimality is automatically achieved. It is a nice state towards which Smith's 'invisible hand' steers us. We can aspire to it, and have a reasonable hope of getting there. Note, however, that we may not get there if there are 'market failures', that is, if there are economic agents who are not price takers (for instance, monopolists), or if there are externalities. There is an 'externality' when the consumption and/or production decisions of one agent affect another in a way not reflected in the price system; see, for example, Bator (1958).

The vices of the notion of Pareto optimality are first, like the notion of wealth maximization, that it ignores distributional fairness. In any economy there are many conceivable initial allocations of resources, some fair and some unfair, and there are also many conceivable Pareto optima. Some of the latter will involve relatively equal allocations of goods, but some will involve drastically unequal allocations. And second, as we will see below, even aside from the issue of fairness, there may be simply too many states that are Pareto optimal.

Hand in hand with the idea of what is 'best' are ideas of what is 'better'. In the abstract, an alternative B is best if there is no feasible alternative A that is better. Connected to the three notions of best mentioned above there are (at least) three notions of better: A is better than B in the classical economics or wealth sense if social wealth under A is greater than social wealth under B. Call this the *wealth better* notion. Alternatively, A is better than B in the utilitarian sense if the sum total of utilities under A is greater than under B. Call this the *utilitarian better* notion. And finally A is better than B in the Pareto sense if some people have higher (ordinal) utilities under A than B, and no one has higher (ordinal) utility under B than A. Call this the *Pareto better* notion.

PARETO OPTIMALITY, THE PARETO BETTER NOTION AND LEGAL NOTION. Those who apply economics to legal topics, like property, torts, crime and contracts, are most often followers of the classical economics school: they are interested in increasing society's wealth, or finding the wealth maximum. Occasionally, they are followers of the modern (Paretian) economics school: interested in maximizing one person's (ordinal) utility, subject to other people's (ordinal) utilities being held constant. Rarely are they now outright utilitarians. (The utilitarian followers may well have been dominant before the 1960s; see Posner 1979: 106. The Paretian followers never were.)

In a seminal article, R.H. Coase (1960) analyses an externality arising from the physical proximity of two business firms – a farmer, and a rancher whose cattle trample the farmer's crops. This is economic analysis applied to property law. Coase is partly motivated by his distaste for the standard treatment of externalities of A.C. Pigou (1920), who recommended that market failures resulting from externalities be remedied by taxes or subsidies. Coase's famous argument is that, providing farmer and rancher can bargain and contract with each other costlessly, it is unnecessary for government to step in with Pigouvian taxes to remedy the cattle/crop externality. All that society need do is to assign a clear legal property right to one party or the other. Once that right is defined, farmer and rancher will bargain and contract their way to a total-wealth-maximizing outcome. This argument is now known as the Coase theorem. (Years later (1988: 160), Coase wrote that his bargaining and contracting model might have reflected his 'subconscious memory of the [contracting] argument in [Edgeworth's] *Mathematical Psychics . . .*'.)

The initial rights definition is necessary, according to Coase, 'since without . . . this initial delimitation of rights there can be no market transactions to transfer and recombine them' (1960: 8) If bargaining and contracting are costly, Coase observes, then society ought to assign rights in such a way that social wealth (net of all appropriate costs) is maximized. Coase's analysis is notable first because of his theorem – making taxes unnecessary for social wealth maximization when there is clear delineation of legal rights and when bargaining is costless – and second because of the attention he pays to 'transaction costs' when those are important. But Pareto optimality is of little relevance in Coase; his optimality notion is wealth maximization. On the other hand, the Coasian bargains struck between farmer and rancher are examples of Pareto better moves.

Economic notions of better and best invaded tort law starting around 1970. Especially notable is J.P. Brown's (1973) analysis, partly based on Calabresi's (1970) work on accidents. In Brown's model the optimum is 'that combination of [accident] avoidance measures which minimizes the sum of the costs of [accident avoidance] controls and the expected cost of the accident' (1973: 325). So Brown is in the classical economics tradition of wealth maximization. Brown analyses eight rules that might govern the assignment of liability between injurer and victim in tort cases, including rules based on a famous 1947 opinion of Judge Learned Hand. Depending on the tort liability law in

force, the outcome might or might not be an optimum – in the wealth-maximizing sense. Since Brown, there has been some economic analysis of torts that explicitly uses the notion of Pareto optimality – in the sense of maximizing party A's utility subject to the constraint that party B's be held constant – particularly that of Shavell (1982 and 1987).

Economic notions of wealth maximization invaded criminal law in the late 1960s, most notably with Becker's (1968) analysis. Becker's model lays out various costs to society of crime (and punishment), all measured in money-equivalents, sums the costs, and then derives conditions for total-net-cost-minimization, that is, social wealth maximization. (Becker relegates utility to two minor footnotes.) The various optimality conditions have certain policy implications, for instance that fines are preferable to imprisonment. Becker's student Ehrlich (1975) applies the Becker model to an economic theory of murder, derives conditions for optimality in the sense of social wealth maximization, and in this context analyzes capital punishment as a deterrent to murder.

Economic notions of wealth maximization are well developed in the economic theory of contract law. Models of contractually interacting sellers and buyers by Shavell (1980), Cooter (1985) and others discuss the optimality (in the sense of net-wealth-maximizing) properties of the standard remedies for breach of contract available under Anglo-American law, such as specific perform-ance, and damages of the expectation, reliance, or resti-tution type. These models are somewhat like the tort models, although the tort models typically come to more optimistic conclusions (for instance, that several liability rules, including commonly used ones, are likely to produce the optimal outcome). The breach of contract models find that the standard damage remedies (expecta-tion, reliance, restitution) would all result in some non-optimal behaviour. Since contracts are usually made by parties who are interested in profits, and since those parties are often risk-neutral, the wealth-maximization model (rather than the strict Pareto approach) is very natural here.

PARETO, POSNER AND CALABRESI. Richard Posner and Guido Calabresi are two of the leaders of modern law and economics analysis; both have been pre-eminent academics and both are, as this is written, pre-eminent judges in US appeals courts. Posner (see, e.g., 1977) is an unabashed believer in wealth maximization (which he calls the 'efficiency norm'), a clear descendant of the classical econ-omists, who holds that (1) when they make decisions judges ought to behave as if they are guided by the over-arching principle of wealth maximization, and that (2) it is an historical fact that, in many branches of law, this is how they have behaved. Posner (1980) is keenly aware of the three notions of 'better' discussed above. He opts for the classical sense, the wealth better sense, and he quickly dis-misses the Pareto better notion, which he views, like many others concerned with practical matters, as 'useless for most policy questions' (1980: 489).

In the same paper Posner makes the interesting claim that there is an *ethical* basis for wealth maximization. It is true that in a concrete setting, a judge weighing the claim of litigant A against litigant B rarely thinks to himself 'the ethical thing to do is to adopt the rule that maximizes total wealth'. But Posner argues that we should all imagine ourselves as a collection of *potential* litigants, thinking about what legal rule we want to adopt, *ex ante*, before we know whether we are the accident victims, say, or the injurers. (Note that Posner borrows this 'veil of ignor-ance' approach from Rawls (1971), who, believing that society should act so as to maximize the utility level of the worst-off person, would come to a radically different conclusion.) If we imagine ourselves in this before-the-fact or behind-the-veil position, Posner claims, we would opt for the legal rule that maximizes average wealth, and by implication our own expected wealth. Thus, we would unanimously consent to wealth-maximizing legal rules, and so, such rules have the ethical basis of unanimous consent.

Posner (1979) compares wealth maximization and utilitarianism as bases for legal rules. He argues force-fully that utilitarianism is a poor basis for law, for many reasons (all of which are long-standing arguments against utilitarianism). First is the boundary problem: when utilitarians maximize the sum of all utilities, who should be included in that sum? Citizens or non-citizens? The unborn? Sheep and pigs? Second is a conflict between total utilitarianism and average utilitarianism. Is the maxi-mand the sum of all utilities? Or is it that divided by the number of people? If the former, it is better to have a society with an enormous number of miserable people than one with a modest number of happy people. If the latter, then one clear policy implication is to kill the unhappy. Third is the old problem, noted by Pareto, that no one has devised a method of utility measurement. Fourth, utilitarianism may endorse morally monstrous behaviour, such as painlessly killing your old, mean and unhappy grandfather.

Having surveyed some nasty implications of utilitarian-ism, Posner opts for wealth maximization. He claims that, among other things, wealth maximization is consistent with our usual notions of virtue (such as keeping promises and telling the truth), and that it is consistent with our usual notions of rights and justice.

Calabresi is on the other side of the philosophical fence from Posner; he allows that society has goals that are as important, or more important, than wealth maximization. But he joins Posner in rejecting the notion of Pareto optimality as a guide to legal principles. Recall the Coase theorem, according to which, absent transaction costs, any initial assignment of rights between farmer and rancher will ultimately lead to an optimal (that is, wealth-maximizing) end point, and that the move from the initial assignment to the end point will be a Pareto better move. Calabresi (1991) claims that no matter what the initial assignment, any outcome will be Pareto optimal even when there are transaction costs! The reason is that transaction costs ought to count in the calculation of what is and is not Pareto optimal, just as, for instance, costs of labour and capital go directly into the calculation of what is profit maximizing, and therefore indirectly into the calculation of what is Pareto optimal.

Once one accepts that costs of bargaining and contracting are just like costs of building a car, then every equilibrium state must be Pareto optimal, because if it weren't, people would already have discovered the Pareto better alternatives and moved there. The notion of Pareto optimality is therefore useless, according to Calabresi, because it includes everything. In terms of what economists call utility frontiers (that is, loci of Pareto optima in a two-or-more-person utility diagram), there really are no moves to the frontier; all relevant policy choices involve moves along the frontier, or shifts of the frontier. Every state we consider is already Pareto optimal, and any change will hurt somebody.

Nor does wealth maximization provide a way out of the dilemma, according to Calabresi. Absent transaction costs, any wealth-increasing move would already have been made, automatically, as in the Coase theorem. With transaction costs, if the move from B to A increases wealth, even when all such costs have been figured in, it still must inevitably worsen the position of someone, for otherwise the move would have been made. (This argument suggests that the notion of transaction costs may be disturbingly vague, and that the notion of increasing wealth needs careful analysis.) Therefore, according to Calabresi, any judgment about the desirability of A over B must face the issue of distributional fairness. In the end, since virtually everything is Pareto optimal, any weighing of alternatives must be based in good part on distributional considerations, and in part on other considerations.

THE PLACE OF PARETO OPTIMALITY IN DISCUSSIONS OF ECONOMICS AND THE LAW. Vilfredo Pareto would probably be distraught with this outcome. His notions of better and best, based on comparisons of vectors of ordinal utilities, seem to escape the impossibilities of the utilitarian approach, and seem to formalize nicely, in the first fundamental theorem, the connection between competitive markets and an 'optimum' for society. I think he would be amazed by the claim that *everything* is Pareto optimal. As any economics student knows, throwing a dart at a standard Edgeworth–Pareto box diagram hits a non-Pareto optimal point 100 percent of the time, and hits a Pareto optimal point 0 percent of the time. This suggests, in the world of theory, that almost everything is non-Pareto optimal, and almost nothing is Pareto optimal.

Yet in reality we do not live in an Edgeworth–Pareto box diagram. In the world of government policy choices, or choices of legal rules, almost every move makes someone worse off. If the move from B to A makes someone worse off and the move from A to B does also, and if this is true for all the relevant choices, then all the choices are Pareto optimal. Consequently the set of Pareto optima is really much too large. We are then forced to consider wealth maximization, although we are aware of the major logical problems in the notion of wealth. And we may also have to consider issues of distributional fairness, even utility gains and losses, before opting for one policy over another.

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See also CALABRESI, GUIDO; COORDINATION GAMES; KALDOR–HICKS COMPENSATION; LEGAL PATERNALISM AND EFFICIENCY; POSNER, RICHARD A.; REGULATORY CAPTURE; VALUE MAXIMIZATION; WEALTH MAXIMIZATION.

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partnership. A partnership is a type of firm – that is, a contract that substitutes hierarchical governance for a series of discrete market transactions (Coase 1937). Though many different types of firms can be partnerships, partnerships are analysed here mainly in relation to the 'standard form' rules set forth in partnership statutes and case law (Coase 1937; Masten 1988).

The following discussion focuses on US partnership law, which is based on the Uniform Partnership Act (UPA) or the Revised Uniform Partnership Act (RUPA). US law closely resembles English partnership law (Partnership Act 1890), upon which the original Uniform Partnership Act was based. English and US partnership law differ in some respects from that of other industrialized countries, including regarding voting rules and requisite formalities. A few important differences between US and German law are noted below. However, the similarities among different countries' partnership laws are more important than the differences. Partnerships in all of these countries are the basic form of business association and share certain fundamental characteristics to which most of the following discussion applies: partners are personally liable for debts of the partnership and, at least in the absence of contrary agreement, participate directly in management and control and may veto the admission of new members (Heenen 1975).

Partnership default rules, like those for other types of business associations, are agreements that the parties to the firm can adopt without incurring the costs of customized contracting (Ribstein 1995a). These rules are designed for actors who function as monitors with the power to control inputs and the right to share in the marginal product of their efforts (Alchian and Demsetz 1972). As such, partners can be viewed as members of a coalition who collectively own the firm's assets, including its goodwill (Hart and Moore 1990).

In the absence of contrary agreement, partners are both owners and managers. This distinguishes partnerships from corporations in which ownership and management are usually separated (Fama and Jensen 1983). As owner-managers, partners are both agents of the firm and principals who are represented by the other partners and who are personally liable for the firm's debts.

Partners can waive most partnership default rules in their agreements (Easterbrook and Fischel 1993; Ribstein 1997b). However, courts may interpret some statutory or judicial rules, such as fiduciary or good faith duties, as mandatory or at least enforce only contracts that explicitly contract around the rules. This may be explained by the inherent incompleteness of firm-type contracts and the impracticality of anticipating all contingencies in the initial agreement (Grossman and Hart 1986). On the other hand, even rules that are apparently mandatory are actually optional in the sense that the parties can avoid them by contracting for a different form of relationship or to be governed by the law of a different jurisdiction.

EXISTENCE OF PARTNERSHIP RELATIONSHIP. Partnership default rules apply to those who agree to be partners or to deal with partnerships. Partnership is defined by US partnership law as 'an association of two or more persons to carry on as co-owners a business for profit' (UPA, §6(1); RUPA, §202). Co-ownership of the partnership, as for other forms of property (Grossman and Hart 1986), is indicated by sharing the residual claim to earnings and rights to control and manage the property (UPA §§7 and 18, RUPA §§202 and 401). Parties may contract explicitly to be partners or they may be partners as a result of contracting to form a relationship that fits the statutory definition of partnership. Since partnership law usually does not require a formal filing, it is often unclear whether contracting parties have elected to be subject to partnership rules. For example, the parties may enter into an employer–employee or debtor–creditor relationship that has some elements of partnership, particularly including joint control and profit-sharing. The issue in these cases is whether the partnership owns certain inputs or contracts with other owners for their use.

MANAGEMENT AND VOTING. As discussed above, partners participate directly in management (UPA §18(e) and RUPA §401(f)). In larger and more complex partnerships, partners may vary the default rule by creating a management committee to run the firm in order to minimize decision-making costs and permit specialization of ownership and management functions.

Under the assumption that all partners are monitors and make important contributions to the firm's value, partnership default rules give each partner one vote rather than apportioning votes by the value of money contributions as under corporate law. Where partners' contributions vary, the partnership agreement may allocate voting rights according to partner contributions.

US partnership statutes provide, subject to contrary agreement, that a majority of the partners must approve 'ordinary' decisions while all must approve extraordinary decisions. The latter category includes amendment of the agreement and admission of new partners who will co-own and co-manage the firm (UPA §18(h)-(i) and RUPA §401(i)-(j)). The majority voting rule for ordinary decisions is consistent with ownership of the partnership by a coalition of agents who are important to creating and maintaining the firm's value (Hart and Moore 1986: 1135). The majority and unanimity voting rules reflect, respectively, the high coordination costs of getting approval by all members and the costs that certain decisions may impose on dissenters (Buchanan and Tullock 1962).

PARTNER AS AGENT OF THE FIRM. Since partners are by default co-owners and co-managers they are normally empowered to bind the firm in ordinary business transactions with third parties (UPA §9-13, RUPA §301-305). Partners have somewhat broader power to bind the partnership under German partnership law than under the law of other countries, particularly regarding the extent to which third parties are bound by restrictions on authority of which they have actual or constructive knowledge (Heenen 1975: 134-6). Because partners are also assumed