

Entrepreneurship: Productive, Unproductive, and Destructive

Author(s): William J. Baumol

Source: *The Journal of Political Economy*, Vol. 98, No. 5, Part 1 (Oct., 1990), pp. 893-921

Published by: The University of Chicago Press

Stable URL: <http://www.jstor.org/stable/2937617>

Accessed: 29/01/2009 16:46

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=ucpress>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit organization founded in 1995 to build trusted digital archives for scholarship. We work with the scholarly community to preserve their work and the materials they rely upon, and to build a common research platform that promotes the discovery and use of these resources. For more information about JSTOR, please contact support@jstor.org.



The University of Chicago Press is collaborating with JSTOR to digitize, preserve and extend access to *The Journal of Political Economy*.

Entrepreneurship: Productive, Unproductive, and Destructive

William J. Baumol

New York University and Princeton University

The basic hypothesis is that, while the total supply of entrepreneurs varies among societies, the productive contribution of the society's entrepreneurial activities varies much more because of their allocation between productive activities such as innovation and largely unproductive activities such as rent seeking or organized crime. This allocation is heavily influenced by the relative payoffs society offers to such activities. This implies that policy can influence the allocation of entrepreneurship more effectively than it can influence its supply. Historical evidence from ancient Rome, early China, and the Middle Ages and Renaissance in Europe is used to investigate the hypotheses.

It is often assumed that an economy of private enterprise has an automatic bias towards innovation, but this is not so. It has a bias only towards profit. [HOBBSAWM 1969, p. 40]

When conjectures are offered to explain historic slowdowns or great leaps in economic growth, there is the group of usual suspects that is

I am very grateful for the generous support of the research underlying this paper from the Division of Information Science and Technology of the National Science Foundation, the Price Institute for Entrepreneurial Studies, the Center for Entrepreneurial Studies of the Graduate School of Business Administration, New York University, and the C. V. Starr Center for Applied Economics. I am also very much indebted to Vacharee Devakula for her assistance in the research. I owe much to Joel Mokyr, Stefano Fenoaltea, Lawrence Stone, Constance Berman, and Claudia Goldin for help with the substance of the paper and to William Jordan and Theodore Rabb for guidance on references.

regularly rounded up—prominent among them, the entrepreneur. Where growth has slowed, it is implied that a decline in entrepreneurship was partly to blame (perhaps because the culture's "need for achievement" has atrophied). At another time and place, it is said, the flowering of entrepreneurship accounts for unprecedented expansion.

This paper proposes a rather different set of hypotheses, holding that entrepreneurs are always with us and always play *some* substantial role. But there are a variety of roles among which the entrepreneur's efforts can be reallocated, and some of those roles do not follow the constructive and innovative script that is conventionally attributed to that person. Indeed, at times the entrepreneur may even lead a parasitical existence that is actually damaging to the economy. How the entrepreneur acts at a given time and place depends heavily on the rules of the game—the reward structure in the economy—that happen to prevail. Thus the central hypothesis here is that it is the set of rules and not the supply of entrepreneurs *or the nature of their objectives* that undergoes significant changes from one period to another and helps to dictate the ultimate effect on the economy via the *allocation* of entrepreneurial resources. Changes in the rules and other attendant circumstances can, of course, modify the composition of the class of entrepreneurs and can also alter its size. Without denying this or claiming that it has no significance, in this paper I shall seek to focus attention on the allocation of the changing class of entrepreneurs rather than its magnitude and makeup. (For an excellent analysis of the basic hypothesis, independently derived, see Murphy, Shleifer, and Vishny [1990].)

The basic proposition, if sustained by the evidence, has an important implication for growth policy. The notion that our productivity problems reside in "the spirit of entrepreneurship" that waxes and wanes for unexplained reasons is a counsel of despair, for it gives no guidance on how to reawaken that spirit once it has lagged. If that is the task assigned to policymakers, they are destitute: they have no means of knowing how to carry it out. But if what is required is the adjustment of rules of the game to induce a more felicitous allocation of entrepreneurial resources, then the policymaker's task is less formidable, and it is certainly not hopeless. The prevailing rules that affect the allocation of entrepreneurial activity can be observed, described, and, with luck, modified and improved, as will be illustrated here.

Here, extensive historical illustrations will be cited to impart plausibility to the contentions that have just been described. Then a short discussion of some current issues involving the allocation of entrepreneurship between productive and unproductive activities will be of-

ferred. Finally, I shall consider very briefly the means that can be used to change the rules of the game, and to do so in a manner that stimulates the productive contribution of the entrepreneur.

I. On the Historical Character of the Evidence

Given the inescapable problems for empirical as well as theoretical study of entrepreneurship, what sort of evidence can one hope to provide? Since the rules of the game usually change very slowly, a case study approach to investigation of my hypotheses drives me unavoidably to examples spanning considerable periods of history and encompassing widely different cultures and geographic locations. Here I shall proceed on the basis of historical illustrations encompassing all the main economic periods and places (ancient Rome, medieval China, Dark Age Europe, the Later Middle Ages, etc.) that the economic historians almost universally single out for the light they shed on the process of innovation and its diffusion. These will be used to show that the relative rewards to different types of entrepreneurial activity have in fact varied dramatically from one time and place to another and that this seems to have had profound effects on patterns of entrepreneurial behavior. Finally, evidence will be offered *suggesting* that such reallocations can have a considerable influence on the prosperity and growth of an economy, though other variables undoubtedly also play substantial roles.

None of this can, of course, be considered conclusive. Yet, it is surely a standard tenet of scientific method that tentative confirmation of a hypothesis is provided by observation of phenomena that the hypothesis helps to explain and that could not easily be accounted for if that hypothesis were invalid. It is on this sort of reasoning that I hope to rest my case. Historians have long been puzzled, for example, by the failure of the society of ancient Rome to disseminate and put into widespread practical use some of the sophisticated technological developments that we know to have been in its possession, while in the "High Middle Ages," a period in which progress and change were hardly popular notions, inventions that languished in Rome seem to have spread like wildfire. It will be argued that the hypothesis about the allocability of entrepreneurial effort between productive and unproductive activity helps considerably to account for this phenomenon, though it certainly will *not* be claimed that this is all there was to the matter.

Before I get to the substance of the discussion, it is important to emphasize that nothing that follows in this article makes any pretense of constituting a contribution to economic history. Certainly it is not intended here to try to explain any particular historical event. More-

over, the analysis relies entirely on secondary sources, and all the historical developments described are well known to historians, as the citations will indicate. Whatever the contribution that may be offered by the following pages, then, it is confined to enhanced understanding and extension of the (nonmathematical) theory of entrepreneurship in general, and not to an improved analysis of the historical events that are cited.

II. The Schumpeterian Model Extended: Allocation of Entrepreneurship

The analysis of this paper rests on what seems to be the one theoretical model that effectively encompasses the role of the entrepreneur and that really “works,” in the sense that it constitutes the basis for a number of substantive inferences.¹ This is, of course, the well-known Schumpeterian analysis, whose main shortcoming, for our purposes, is the paucity of insights on policy that emerge from it. It will be suggested here that only a minor extension of that model to encompass the *allocation* of entrepreneurship is required to enhance its power substantially in this direction.

Schumpeter tells us that innovations (he calls them “the carrying out of new combinations”) take various forms besides mere improvements in technology:

This concept covers the following five cases: (1) the introduction of a new good—that is one with which consumers are not yet familiar—or of a new quality of a good. (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before. (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be

¹ There has, however, recently been an outburst of illuminating writings on the theory of the innovation process, analyzing it in such terms as *races* for patents in which the winner takes everything, with no consolation prize for a close second, or treating the process, alternatively, as a “waiting game,” in which the patient second entrant may outperform and even survive the first one in the innovative arena, who incurs the bulk of the risk. For an overview of these discussions as well as some substantial added insights, see Dasgupta (1988).

created. (5) The carrying out of the new organization of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position. [(1912) 1934, p. 66]

The obvious fact that entrepreneurs undertake such a variety of tasks all at once suggests that theory can usefully undertake to consider what determines the *allocation* of entrepreneurial inputs among those tasks. Just as the literature traditionally studies the allocation of other inputs, for example, capital resources, among the various industries that compete for them, it seems natural to ask what influences the flow of entrepreneurial talent among the various activities in Schumpeter's list.

Presumably the reason no such line of inquiry was pursued by Schumpeter or his successors is that any analysis of the allocation of entrepreneurial resources among the five items in the preceding list (with the exception of the last—the creation or destruction of a monopoly) does not promise to yield any profound conclusions. There is no obvious reason to make much of a shift of entrepreneurial activity away from, say, improvement in the production process and toward the introduction of new products. The general implications, if any, for the public welfare, for productivity growth, and for other related matters are hardly obvious.

To derive more substantive results from an analysis of the allocation of entrepreneurial resources, it is necessary to expand Schumpeter's list, whose main deficiency seems to be that it does not go far enough. For example, it does not explicitly encompass innovative acts of technology transfer that take advantage of opportunities to introduce already-available technology (usually with some modification to adapt it to local conditions) to geographic locales whose suitability for the purpose had previously gone unrecognized or at least unused.

Most important for the discussion here, Schumpeter's list of entrepreneurial activities can usefully be expanded to include such items as innovations in rent-seeking procedures, for example, discovery of a previously unused legal gambit that is effective in diverting rents to those who are first in exploiting it. It may seem strange at first blush to propose inclusion of activities of such questionable value to society (I shall call them acts of "unproductive entrepreneurship") in the list of Schumpeterian innovations (though the creation of a monopoly, which Schumpeter does include as an innovation, is surely as questionable), but, as will soon be seen, this is a crucial step for the analysis that follows. If entrepreneurs are defined, simply, to be persons who are ingenious and creative in finding ways that add to their own wealth, power, and prestige, then it is to be expected that not all of

them will be overly concerned with whether an activity that achieves these goals adds much or little to the social product or, for that matter, even whether it is an actual impediment to production (this notion goes back, at least, to Veblen [1904]). Suppose that it turns out, in addition, that at any time and place the magnitude of the benefit the economy derives from its entrepreneurial talents depends *substantially*, among other variables, on the allocation of this resource between productive and unproductive entrepreneurial activities of the sorts just described. Then the reasons for including acts of the latter type in the list of entrepreneurial activities become clear.

Here no exhaustive analysis of the process of allocation of entrepreneurial activity among the set of available options will be attempted. Rather, it will be argued only that at least *one* of the prime determinants of entrepreneurial behavior at any particular time and place is the prevailing rules of the game that govern the payoff of one entrepreneurial activity relative to another. If the rules are such as to impede the earning of much wealth via activity A, or are such as to impose social disgrace on those who engage in it, then, other things being equal, entrepreneurs' efforts will tend to be channeled to other activities, call them B. But if B contributes less to production or welfare than A, the consequences for society may be considerable.²

As a last preliminary note, it should be emphasized that the set of active entrepreneurs may be subject to change. Thus if the rules of the game begin to favor B over A, it may not be just the same individuals who switch their activities from entrepreneurship of type A to that of type B. Rather, some persons with talents suited for A may simply drop out of the picture, and individuals with abilities adapted to B may for the first time become entrepreneurs. Thus the allocation of entrepreneurs among activities is perhaps best described in the way Joan Robinson (following Shove's suggestion) analyzed the allocation of heterogeneous land resources (1933, chap. 8): as the solution of a jigsaw puzzle in which the pieces are each fitted into the places selected for them by the concatenation of pertinent circumstances.

III. Entrepreneurship, Productive and Unproductive: The Rules Do Change

Let us now turn to the central hypothesis of this paper: that the exercise of entrepreneurship can sometimes be unproductive or even

² There is a substantial literature, following the work of Jacob Schmookler, providing strong empirical evidence for the proposition that even the allocation of inventive effort, i.e., the directions pursued by inventive activities, is itself heavily influenced by relative payoff prospects. However, it is now agreed that some of these authors go too far when they appear to imply that almost nothing but the demand for the product of invention influences to any great extent which inventions will occur. For a good summary and references, see Abramovitz (1989, p. 33).

destructive, and that whether it takes one of these directions or one that is more benign depends heavily on the structure of payoffs in the economy—the rules of the game. The rather dramatic illustrations provided by world history seem to confirm quite emphatically the following proposition.

PROPOSITION 1. The rules of the game that determine the relative payoffs to different entrepreneurial activities *do* change dramatically from one time and place to another.

These examples also suggest strongly (but hardly “prove”) the following proposition.

PROPOSITION 2. Entrepreneurial behavior changes direction from one economy to another in a manner that corresponds to the variations in the rules of the game.

A. *Ancient Rome*

The avenues open to those Romans who sought power, prestige, and wealth are instructive. First, it may be noted that they had no reservations about the desirability of wealth or about its pursuit (e.g., Finley 1985, pp. 53–57). *As long as it did not involve participation in industry or commerce*, there was nothing degrading about the wealth acquisition process. Persons of honorable status had three primary and acceptable sources of income: landholding (not infrequently as absentee landlords), “usury,” and what may be described as “political payments”:

The opportunity for “political moneymaking” can hardly be over-estimated. Money poured in from booty, indemnities, provincial taxes, loans and miscellaneous extractions in quantities without precedent in Graeco-Roman history, and at an accelerating rate. The public treasury benefited, but probably more remained in private hands, among the nobles in the first instance; then, in appropriately decreasing proportions, among the *equites*, the soldiers and even the plebs of the city of Rome. . . . Nevertheless, the whole phenomenon is misunderstood when it is classified under the headings of “corruption” and “malpractice”, as historians still persist in doing. Cicero was an honest governor of Cilicia in 51 and 50 B.C., so that at the end of his term he had earned only the legitimate profits of office. They amounted to 2,200,000 sesterces, more than treble the figure of 600,000 he himself once mentioned (*Stoic Paradoxes* 49) to illustrate an annual income that could permit a life of luxury. We are faced with something structural in the society. [Finley 1985, p. 55]

Who, then, operated commerce and industry? According to Veyne (1961), it was an occupation heavily undertaken by freedmen—former slaves who, incidentally, bore a social stigma for life. Indeed, according to this writer, slavery may have represented the one avenue for advancement for someone from the lower classes. A clever (and handsome) member of the lower orders might deliberately arrange to be sold into slavery to a wealthy and powerful master.³ Then, with luck, skill, and drive, he would grow close to his owner, perhaps managing his financial affairs (and sometimes engaging in some homosexual activity with him). The master then gained cachet, after a suitable period, by granting freedom to the slave, setting him up with a fortune of his own. The freedmen, apparently not atypically, invested their financial stakes in commerce, hoping to multiply them sufficiently to enable them to retire in style to the countryside, thereafter investing primarily in land and loans in imitation of the upper classes.

Finally, regarding the Romans' attitude to the promotion of technology and productivity, Finley makes much of the "clear, almost total, divorce between science and practice" (1965, p. 32). He goes on to cite Vitruvius's monumental work on architecture and technology, in whose 10 books he finds only a single and trivial reference to means of saving effort and increasing productivity. Finley then reports the following story:

There is a story, repeated by a number of Roman writers, that a man—characteristically unnamed—invented unbreakable glass and demonstrated it to Tiberius in anticipation of a great reward. The emperor asked the inventor whether anyone shared his secret and was assured that there was no one else; whereupon his head was promptly removed, lest, said Tiberius, gold be reduced to the value of mud. I have no opinion about the truth of this story, and it is only a story. But is it not interesting that neither the elder Pliny nor Petronius nor the historian Dio Cassius was troubled by the point that the inventor turned to the emperor for a reward, instead of turning to an investor for capital with which to put his invention into production?⁴ . . . We must

³ Stefano Fenoaltea comments that he knows no documented cases in which this occurred and that it was undoubtedly more common to seek advancement through adoption into an upper-class family.

⁴ To be fair to Finley, note that he concludes that it is *not* really interesting. North and Thomas (1973, p. 3) make a similar point about Harrison's invention of the ship's chronometer in the eighteenth century (as an instrument indispensable for the determination of longitude). They point out that the incentive for this invention was a large governmental prize rather than the prospect of commercial profit, presumably because of the absence of effective patent protection.

remind ourselves time and again that the European experience since the late Middle Ages in technology, in the economy, and in the value systems that accompanied them, was unique in human history until the recent export trend commenced. Technical progress, economic growth, productivity, even efficiency have not been significant goals since the beginning of time. So long as an acceptable life-style could be maintained, however that was defined, other values held the stage. [1985, p. 147]

The bottom line, for our purposes, is that the Roman reward system, although it offered wealth to those who engaged in commerce and industry, offset this gain through the attendant loss in prestige. Economic effort "was neither the way to wealth nor its purpose. Cato's gods showed him a number of ways to get more; but they were all political and parasitical, the ways of conquest and booty and usury; labour was not one of them, not even the labour of the entrepreneur" (Finley 1965, p. 39).

B. Medieval China

In China, as in many kingdoms of Europe before the guarantees of the Magna Carta and the revival of towns and their acquisition of privileges, the monarch commonly claimed possession of all property in his territories. As a result, particularly in China, when the sovereign was in financial straits, confiscation of the property of wealthy subjects was entirely in order. It has been claimed that this led those who had resources to avoid investing them in any sort of visible capital stocks, and that this, in turn, was a substantial impediment to economic expansion (see Balazs 1964, p. 53; Landes 1969, pp. 46–47; Rosenberg and Birdzell 1986, pp. 119–20; Jones 1987, chap. 5).

In addition, imperial China reserved its most substantial rewards in wealth and prestige for those who climbed the ladder of imperial examinations, which were heavily devoted to subjects such as Confucian philosophy and calligraphy. Successful candidates were often awarded high rank in the bureaucracy, high social standing denied to anyone engaged in commerce or industry, even to those who gained great wealth in the process (and who often used their resources to prepare their descendants to contend via the examinations for a position in the scholar bureaucracy). In other words, the rules of the game seem to have been heavily biased against the acquisition of wealth *and position* through Schumpeterian behavior. The avenue to success lay elsewhere.

Because of the difficulty of the examinations, the mandarins (scholar-officials) rarely succeeded in keeping such positions in their

own families for more than two or three generations (see Marsh 1961, p. 159; Ho 1962, chap. 4 and appendix). The scholar families devoted enormous effort and considerable resources to preparing their children through years of laborious study for the imperial examinations, which, during the Sung dynasty, were held every 3 years, and only several hundred persons in all of China succeeded in passing them each time (E. A. Kracke, Jr. in Liu and Golas [1969, p. 14]). Yet, regularly, some persons not from mandarin families also attained success through this avenue (see, e.g., Marsh [1961] and Ho [1962] for evidence on social mobility in imperial China).

Wealth was in prospect for those who passed the examination and who were subsequently appointed to government positions. But the sources of their earnings had something in common with those of the Romans:

Corruption, which is widespread in all impoverished and backward countries (or, more exactly, throughout the pre-industrial world), was endemic in a country where the servants of the state often had nothing to live on but their very meager salaries. The required attitude of obedience to superiors made it impossible for officials to demand higher salaries, and in the absence of any control over their activities from below it was inevitable that they should purloin from society what the state failed to provide. According to the usual pattern, a Chinese official entered upon his duties only after spending long years in study and passing many examinations; he then established relations with protectors, incurred debts to get himself appointed, and then proceeded to extract the amount he had spent on preparing himself for his career from the people he administered—and extracted both principal and interest. The degree of his rapacity would be dictated not only by the length of time he had had to wait for his appointment and the number of relations he had to support and of kin to satisfy or repay, but also by the precariousness of his position. [Balazs 1964, p. 10]

Enterprise, on the other hand, was not only frowned on, but may have been subjected to impediments deliberately imposed by the officials, at least after the fourteenth century A.D.; and some historians claim that it was true much earlier. Balazs tells us of

the state's tendency to clamp down immediately on any form of private enterprise (and this in the long run kills not only initiative but even the slightest attempts at innovation), or, if it did not succeed in putting a stop to it in time, to take over

and nationalize it. Did it not frequently happen during the course of Chinese history that the scholar-officials, although hostile to all inventions, nevertheless gathered in the fruits of other people's ingenuity? I need mention only three examples of inventions that met this fate: paper, invented by a eunuch; printing, used by the Buddhists as a medium for religious propaganda; and the bill of exchange, an expedient of private businessmen. [P. 18]

As a result of recurrent intervention by the state to curtail the liberty and take over any accumulated advantages the merchant class had managed to gain for itself, "the merchant's ambition turned to becoming a scholar-official and investing his profits in land" (p. 32).

C. The Earlier Middle Ages

Before the rise of the cities and before monarchs were able to subdue the bellicose activities of the nobility, wealth and power were pursued primarily through military activity. Since land and castles were the medieval forms of wealth most highly valued and most avidly sought after, it seems reasonable to interpret the warring of the barons in good part as the pursuit of an economic objective. For example, during the reign of William the Conqueror (see, e.g., Douglas 1964), there were frequent attempts by the barons in Normandy and neighboring portions of France to take over each other's lands and castles. A prime incentive for William's supporters in his conquest of England was their obvious aspiration for lands.⁵ More than that, violent means also served to provide more liquid forms of income (captured treasure), which the nobility used to support both private consumption and investment in military plant and equipment, where such items could not easily be produced on their own lands and therefore had to be purchased from others. In England, with its institution of primogeniture (the exclusive right of the eldest son to inherit his father's estate), younger sons who chose not to enter the clergy often had no socially acceptable choice other than warfare as a means to make their fortunes, and in some cases they succeeded spectacularly. Thus note the case of William Marshal, fourth son of a minor noble, who rose

⁵ The conquest has at least two noteworthy entrepreneurial sides. First, it involved an innovation, the use of the stirrup by the Normans at Hastings that enabled William's warriors to use the same spear to impale a series of victims with the force of the horse's charge, rather than just tossing the spear at the enemy, much as an infantryman could. Second, the invasion was an impressive act of organization, with William having to convince his untrustworthy allies that they had more to gain by joining him in England than by staying behind to profit from his absence by trying to grab away his lands as they had tried to do many times before.

through his military accomplishments to be one of the most powerful and trusted officials under Henry II and Richard I, and became one of the wealthiest men in England (see Painter 1933).

Of course, the medieval nobles were not purely economic men. Many of the turbulent barons undoubtedly enjoyed fighting for its own sake, and success in combat was an important avenue to prestige in their society. But no modern capitalist is a purely economic man either. What I am saying here is that warfare, which was of course pursued for a variety of reasons, was *also* undertaken as a primary source of economic gain. This is clearly all the more true of the mercenary armies that were the scourge of fourteenth-century France and Italy.

Such violent economic activity, moreover, inspired frequent and profound innovation. The introduction of the stirrup was a requisite for effective cavalry tactics. Castle building evolved from wooden to stone structures and from rectangular to round towers (which could not be made to collapse by undermining their corners). Armor and weaponry became much more sophisticated with the introduction of the crossbow, the longbow, and, ultimately, artillery based on gunpowder. Military tactics and strategy also grew in sophistication. These innovations can be interpreted as contributions of military entrepreneurs undertaken at least partly in pursuit of private economic gains.

This type of entrepreneurial undertaking obviously differs vastly from the introduction of a cost-saving industrial process or a valuable new consumer product. An individual who pursues wealth through the forcible appropriation of the possessions of others surely does not add to the national product. Its net effect may be not merely a transfer but a net reduction in social income and wealth.⁶

⁶ In saying all this, I must not be interpreted as taking the conventional view that warfare is an unmitigated source of impoverishment of any economy that unquestionably never contributes to its prosperity. Careful recent studies have indicated that matters are more complicated (see, e.g., Milward 1970; Olson 1982). Certainly the unprecedented prosperity enjoyed afterward by the countries on the losing side of the Second World War suggests that warfare need not always preclude economic expansion, and it is easy to provide earlier examples. The three great economic leaders of the Western world preceding the United States—Italy in the thirteenth–sixteenth centuries, the Dutch Republic in the seventeenth and eighteenth, and Great Britain in the eighteenth and nineteenth—each attained the height of their prosperity after periods of enormously costly and sometimes destructive warfare. Nevertheless, the wealth gained by a medieval baron from the adoption of a novel bellicose technique can hardly have contributed to economic growth in the way that resulted from adoption of a new steelmaking process in the nineteenth century or the introduction of a product such as the motor vehicle in the twentieth.

D. The Later Middle Ages

By the end of the eleventh century the rules of the game had changed from those of the Dark Ages. The revival of the towns was well under way. They had acquired a number of privileges, among them protection from arbitrary taxation and confiscation and the creation of a labor force by granting freedom to runaway serfs after a relatively brief residence (a year and a day) in the towns. The free-enterprise turbulence of the barons had at least been impeded by the church's pacification efforts: the peace and the (later) truce of God in France, Spain, and elsewhere; similar changes were taking place in England (see, e.g., Cowdrey [1970]; but Jones [1987, p. 94] suggests that some free-enterprise military activity by the barons continued in England through the reigns of the earlier Tudors in the sixteenth century). All this subsequently "gave way to more developed efforts to enforce peace by the more organized governments of the twelfth century" (Brooke 1964, p. 350; also p. 127). A number of activities that were neither agricultural nor military began to yield handsome returns. For example, the small group of architect-engineers who were in charge of the building of cathedrals, palaces, bridges, and fortresses could live in great luxury in the service of their kings.

But, apparently, a far more common source of earnings was the water-driven mills that were strikingly common in France and southern England by the eleventh century, a technological innovation about which more will be said presently. An incentive for such technical advances may have been the monopoly they conferred on their owners rather than any resulting improvement in efficiency. Such monopoly rights were alike sought and enforced by private parties (Bloch 1935, pp. 554–57; Brooke 1964, p. 84) and by religious organizations (see below).

The economic role of the monks in this is somewhat puzzling—the least clear-cut part of our story.⁷ The Cistercian abbeys are generally assigned a critical role in the promotion of such technological advances. In some cases they simply took over mills that had been constructed by others (Berman 1986, p. 89). But the Cistercians improved them, built many others, and vastly expanded their use; at

⁷ Bloch (1935) notes that the monasteries had both the capital and the large number of consumers of flour necessary to make the mills profitable. In addition, they were less likely than lay communities to undergo military siege, which, Bloch notes, was (besides drought and freezing of the waterways) one of the main impediments to adoption of the water mill, since blocking of the waterway that drove the mill could threaten the besieged population with starvation (pp. 550–53).

least some writers (e.g., Gimpel 1976, pp. 3–6) seem to suggest that the Cistercians were the spearhead of technological advance.

Historians tell us that they have no ready explanation for the entrepreneurial propensities of this monastic order. (See, e.g., Brooke [1964, p. 69] and also a personal communication to me from Constance Berman. Ovitt [1987, esp. pp. 142–47] suggests that this may all have been part of the twelfth-century monastic drive to reduce or eliminate manual labor in order to maximize the time available for the less onerous religious labors—a conclusion with which Bloch [1935, p. 553] concurs.) But the evidence suggests strongly that avid entrepreneurs they were. They accumulated vast tracts of land; the sizes of their domesticated animal flocks were enormous by the standards of the time; their investment rates were remarkable; they sought to exercise monopoly power, being known, after the erection of a water mill, to seek legal intervention to prevent nearby residents from continuing to use their animal-powered facilities (Gimpel 1976, pp. 15–16); they were fierce in their rivalrous behavior and drive for expansion, in the process not sparing other religious bodies—not even other Cistercian houses. There is a “record of pastoral expansionism and monopolies over access established by the wealthiest Cistercian houses . . . at the expense of smaller abbeys and convents . . . effectively pushing out all other religious houses as competitors” (Berman 1986, p. 112).

As with early capitalists, the asceticism of the monks, by keeping down the proportion of the monastery’s output that was consumed, helped to provide the resources for levels of investment extraordinary for the period (pp. 40, 83). The rules of the game appear to have offered substantial economic rewards to exercise of Cistercian entrepreneurship. The order obtained relatively few large gifts, but instead frequently received support from the laity and from the church establishment in the form of exemptions from road and river tolls and from payment of the tithe. This obviously increased the *marginal* yield of investment, innovation, and expenditure of effort, and the evidence suggests the diligence of the order in pursuing the resulting opportunities. Their mills, their extensive lands, and their large flocks are reported to have brought scale economies and extraordinary financial returns (chap. 4). Puritanical, at least in earlier years, in their self-proclaimed adherence to simplicity in personal lifestyle while engaged in dedicated pursuit of wealth, they may perhaps represent an early manifestation of elements of “the Protestant ethic.” But whatever their motive, the reported Cistercian record of promotion of technological progress is in diametric contrast to that of the Roman empire.

E. Fourteenth Century

The fourteenth century brought with it a considerable increase in military activity, notably the Hundred Years' War between France and England. Payoffs, surely, must have tilted to favor more than before inventions designed for military purposes. Cannons appeared as siege devices and armor was made heavier. More imaginative war devices were proposed: a windmill-propelled war wagon, a multibarreled machine gun, and a diving suit to permit underwater attacks on ships. A pervasive business enterprise of this unhappy century of war was the company of mercenary troops—the *condottiere*—who roamed Europe, supported the side that could offer the most attractive terms, and in lulls between fighting, when unemployment threatened, wandered about thinking up military enterprises of their own, at the expense of the general public (Gimpel 1976, chap. 9; see also McNeill 1969, pp. 33–39). Clearly, the rules of the game—the system of entrepreneurial rewards—had changed, to the disadvantage of productive entrepreneurship.

F. Early Rent Seeking

Unproductive entrepreneurship can also take less violent forms, usually involving various types of rent seeking, the type of (possibly) unproductive entrepreneurship that seems most relevant today. Enterprising use of the legal system for rent-seeking purposes has a long history. There are, for example, records of the use of litigation in the twelfth century in which the proprietor of a water-driven mill sought and won a prohibition of use in the vicinity of mills driven by animal or human power (Gimpel 1976, pp. 25–26). In another case, the operators of two dams, one upstream of the other, sued one another repeatedly at least from the second half of the thirteenth century until the beginning of the fifteenth, when the downstream dam finally succeeded in driving the other out of business as the latter ran out of money to pay the court fees (pp. 17–20).

In the upper strata of society, rent seeking also gradually replaced military activity as a prime source of wealth and power. This transition can perhaps be ascribed to the triumph of the monarchies and the consequent imposition of law and order. Rent-seeking entrepreneurship then took a variety of forms, notably the quest for grants of land and patents of monopoly from the monarch. Such activities can, of course, sometimes prove to contribute to production, as when the recipient of land given by the monarch uses it more efficiently than the previous owner did. But there seems to have been nothing in the

structure of the land-granting process that ensured even a tendency toward transfer to more productive proprietors, nor was the individual who sought such grants likely to use as an argument in favor of his suit the claim that he was likely to be the more productive user (in terms of, say, the expected net value of its agricultural output).

Military forms of entrepreneurship may have experienced a renaissance in England in the seventeenth century with the revolt against Charles I. How that may have changed the structure of rewards to entrepreneurial activity is suggested by Hobsbawm (1969), who claims that at the end of the seventeenth century the most affluent merchants earned perhaps three times as much as the richest "master manufacturers."⁸ But, he reports, the wealthiest noble families probably had incomes more than 10 times as large as those of the rich merchants. The point in this is that those noble families, according to Hobsbawm, were no holdovers from an ancient feudal aristocracy; they were, rather, the heirs of the Roundheads (the supporters of the parliamentary, or puritan, party) in the then-recent Civil War (pp. 30–32). On this view, once again, military activity would seem to have become the entrepreneur's most promising recourse.

But other historians take a rather different view of the matter. Studies reported in Thirsk (1954) indicate that ultimately there was little redistribution of property as the result of the Civil War and the restoration. Rather it is noted that in this period the "patrician élites depended for their political power and economic prosperity on royal charters and monopolies rather than on talent and entrepreneurial initiative" (Stone 1985, p. 45). In this interpretation of the matter, it was rent seeking, not military activity, that remained the prime source of wealth under the restoration.

By the time the eighteenth-century industrial revolution ("the" industrial revolution) arrived, matters had changed once again. According to Ashton (1948, pp. 9–10), grants of monopoly were in good part "swept away" by the Monopolies Act of 1624, and, we are told by Adam Smith (1776), by the end of the eighteenth century they were rarer in England than in any other country. Though industrial activity continued to be considered somewhat degrading in places in which industry flourished, notably in England during the industrial revolution there was probably a difference in degree. Thus Lefebvre (1947, p. 14) reports that "at its upper level the [French] nobility . . . were envious of the English lords who enriched themselves in bourgeois

⁸ The evidence indicates that the wealth of affluent families in Great Britain continues to be derived preponderantly from commerce rather than from industry. This contrasts with the record for the United States, where the reverse appears to be true (see Rubinstein 1980, pp. 22–23, 59–60).

ways,” while in France “the noble ‘derogated’ or fell into the common mass if [like Mirabeau] he followed a business or profession” (p. 11). (See, however, Schama [1989], who tells us that “even a cursory examination of the eighteenth-century French economy . . . reveals the nobility deeply involved in finance, business and industry—certainly as much as their British counterparts. . . . In 1765 a royal edict officially removed the last formal obstacles to their participation in trade and industry” [p. 118].) In England, primogeniture, by forcing younger sons of noble families to resort to commerce and industry, apparently was imparting respectability to these activities to a degree that, while rather limited, may have rarely been paralleled before.

The central point of all the preceding discussion seems clear—perhaps, in retrospect, self-evident. If entrepreneurship is the imaginative pursuit of position, with limited concern about the means used to achieve the purpose, then we can expect changes in the structure of rewards to modify the nature of the entrepreneur’s activities, sometimes drastically. The rules of the game can then be a critical influence helping to determine whether entrepreneurship will be allocated predominantly to activities that are productive or unproductive and even destructive.

IV. Does the Allocation between Productive and Unproductive Entrepreneurship Matter Much?

We come now to the third proposition of this article.

PROPOSITION 3. The allocation of entrepreneurship between productive and unproductive activities, though by no means the only pertinent influence, can have a profound effect on the innovativeness of the economy and the degree of dissemination of its technological discoveries.

It is hard to believe that a system of payoffs that moves entrepreneurship in unproductive directions is not a substantial impediment to industrial innovation and growth in productivity. Still, history permits no test of this proposition through a set of anything resembling controlled experiments, since other influences *did*, undoubtedly, also play important roles, as the proposition recognizes. One can only note what appears to be a remarkable correlation between the degree to which an economy rewarded productive entrepreneurship and the vigor shown in that economy’s innovation record.

Historians tell us of several industrial “near revolutions” that occurred before *the* industrial revolution of the eighteenth century that are highly suggestive for our purposes (Braudel [1986, 3:542–56]; for a more skeptical view, see Coleman [1956]). We are told that two

of the incipient revolutions never went anywhere, while two of them were rather successful in their fashion. I shall report conclusions of some leading historians on these episodes, but it should be recognized by the reader that many of the views summarized here have been disputed in the historical literature, at least to some degree.

A. Rome and Hellenistic Egypt

My earlier discussion cited ancient Rome and its empire as a case in which the rules did not favor productive entrepreneurship. Let us compare this with the evidence on the vigor of innovative activity in that society. The museum at Alexandria was the center of technological innovation in the Roman empire. By the first century B.C., that city knew of virtually every form of machine gearing that is used today, including a working steam engine. But these seem to have been used only to make what amounted to elaborate toys. The steam engine was used only to open and close the doors of a temple.

The Romans also had the water mill. This may well have been the most critical pre-eighteenth-century industrial invention because (outside the use of sails in transportation by water) it provided the first significant source of power other than human and animal labor: "it was able to produce an amount of concentrated energy beyond any other resource of antiquity" (Forbes 1955, 2:90). As steam did in more recent centuries, it offered the prospect of providing the basis for a leap in productivity in the Roman economy, as apparently it actually did during the eleventh, twelfth, and thirteenth centuries in Europe. Yet Finley (1965, pp. 35–36), citing White (1962), reports that "though it was invented in the first century B.C., it was not until the third century A.D. that we find evidence of much use, and not until the fifth and sixth of general use. It is also a fact that we have no evidence at all of its application to other industries [i.e., other than grinding of grain] until the very end of the fourth century, and then no more than one solitary and possibly suspect reference . . . to a marble-slicing machine near Trier."

Unfortunately, evidence of Roman technical stagnation is only spotty, and, further, some historians suggest that the historical reports give inadequate weight to the Roman preoccupation with agricultural improvement relative to improvement in commerce or manufacture. Still, the following quotation seems to summarize the weight of opinion: "Historians have long been puzzled as to why the landlords of the Middle Ages proved so much more enterprising than the landlords of the Roman Empire, although the latter, by and large, were much better educated, had much better opportunities for making technical and scientific discoveries if they had wished to do so"

(Brooke 1964, p. 88). It seems at least plausible that some part of the explanation is to be found in the ancient world's rules of the game, which encouraged the pursuit of wealth but severely discouraged its pursuit through the exercise of productive entrepreneurship.⁹

B. *Medieval China*

The spate of inventions that occurred in ancient China (before it was conquered by the barbarian Yuan dynasty in 1280) constituted one of the earliest potential revolutions in industry. Among the many Chinese technological contributions, one can list paper, (perhaps) the compass, waterwheels, sophisticated water clocks, and, of course, gunpowder. Yet despite the apparent prosperity of the Sung period (960–1270) (see, e.g., Liu and Golas 1969), at least some historians suggest that none of this spate of inventions led to a flowering of *industry*¹⁰ as distinguished from commerce and some degree of general prosperity. And in China too, as we have seen, the rules did not favor productive entrepreneurship. Balazs (1964, p. 53) concludes that

what was chiefly lacking in China for the further development of capitalism was not mechanical skill or scientific aptitude, nor a sufficient accumulation of wealth, but scope for individual enterprise. There was no individual freedom and no security for private enterprise, no legal foundation for rights other than those of the state, no alternative investment other than landed property, no guarantee against being penalized by arbitrary exactions from officials or against intervention by the state. But perhaps the supreme inhibiting

⁹ It has been suggested by historians (see, e.g., Bloch 1935, p. 547) that an abundance of slaves played a key role in Roman failure to use the water mill widely. However, this must imply that the Romans were not efficient wealth seekers. As the cliometric literature has made clear, the cost of maintaining a slave is not low and certainly is not zero, and slaves are apt not to be efficient and dedicated workers. Thus if it had been efficient to replace human or animal power by the inanimate power of the waterways, failure to do so would have cut into the wealth of the slaveholder, in effect saddling him with the feeding of unproductive persons or keeping the slaves who turned the mills from other, more lucrative, occupations. Perhaps Roman landowners *were* fairly unsophisticated in the management of their estates, as Finley (1985, pp. 108–16) suggests, and, if so, there may be some substance to the hypothesis that slavery goes far to account for the failure of water mills to spread in the Roman economy.

¹⁰ Also, as in Rome, none of this was associated with the emergence of a systematic body of science involving coherent theoretical structure and the systematic testing of hypotheses on the basis of experiment or empirical observation. Here, too, the thirteenth-century work of Bishop Grosseteste, William of Henley, and Roger Bacon was an early step toward that unique historical phenomenon—the emergence of a systematic body of science in the West in, say, the sixteenth century (see Needham 1956).

factor was the overwhelming prestige of the state bureaucracy, which maimed from the start any attempt of the bourgeoisie to be different, to become aware of themselves as a class and fight for an autonomous position in society. Free enterprise, ready and proud to take risks, is therefore quite exceptional and abnormal in Chinese economic history.

C. *Slow Growth in the "Dark Ages"*

An era noted for its slow growth occurred between the death of Charlemagne (814) and the end of the tenth century. Even this period was not without its economic advances, which developed slowly, including the beginnings of the agricultural improvements that attended the introduction of the horseshoe, harness, and stirrup, the heavy plow, and the substitution of horsepower for oxen, which may have played a role in enabling peasants to move to more populous villages further from their fields (see White 1962, p. 39 ff.). But, still, it was probably a period of significantly slower growth than the industrial revolution of the eleventh–thirteenth centuries (Gimpel 1976), about which more will be said presently. We have already seen that this was a period in which military violence was a prime outlet for entrepreneurial activity. While this can hardly pretend to be *the* explanation of the relative stagnation of the era, it is hard to believe that it was totally unimportant.

D. *The "High Middle Ages"*

A good deal has already been said about the successful industrial revolution (and the accompanying commercial revolution sparked by inventions such as double-entry bookkeeping and bills of exchange [de Roover 1953]) of the late Middle Ages, whose two-century duration makes it as long-lived as our own (see Carus-Wilson 1941; White 1962; Gimpel 1976).

Perhaps the hallmark of this industrial revolution was that remarkable source of productive power, the water mills, that covered the countryside in the south of England and crowded the banks of the Seine in Paris (see, e.g., Gimpel 1976, pp. 3–6; Berman 1986, pp. 81–89). The mills were not only simple grain-grinding devices but accomplished an astonishing variety of tasks and involved an impressive variety of mechanical devices and sophisticated gear arrangements. They crushed olives, ground mash for beer production, crushed cloth for papermaking, sawed lumber, hammered metal and woolens (as part of the "fulling" process—the cleansing, scouring, and pressing of

woven woolen goods to make them stronger and to bring the threads closer together), milled coins, polished armor, and operated the bellows of blast furnaces. Their mechanisms entailed many forms of ingenuity. Gears were used to translate the vertical circular motion of the efficient form of the waterwheel into the horizontal circular motion of the millstone. The cam (a piece attached, say, to the axle of the waterwheel, protruding from the axle at right angles to its axis of rotation) served to lift a hammer and to drop it repeatedly and automatically (it was apparently known in antiquity, but may not have been used with waterwheels). A crank handle extending from the end of the axle transformed the circular motion of the wheel into the back and forth (reciprocating) motion required for sawing or the operation of bellows. The most sophisticated product of all this mechanical skill and knowledge was the mechanical clock, which appeared toward the end of the thirteenth century. As White (1962, p. 129) sums up the matter, "the four centuries following Leonardo, that is, until electrical energy demanded a supplementary set of devices, were less technologically engaged in discovering basic principles than in elaborating and refining those established during the four centuries before Leonardo."¹¹

In a period in which agriculture probably occupied some 90 percent of the population, the expansion of industry in the twelfth and thirteenth centuries could not by itself have created a major upheaval in living standards.¹² Moreover, it has been deduced from what little we know of European gross domestic product per capita at the beginning of the eighteenth century that its average growth in the preceding six or seven centuries must have been very modest, since if the poverty of that later time had represented substantial growth from

¹¹ As was already noted, science and scientific method also began to make an appearance with contributions such as those of Bishop Grosseteste and Roger Bacon. Walter of Henley championed controlled experiments and observation over recourse to the opinions of ancient authorities and made a clear distinction between economic and engineering efficiency in discussing the advisability of substituting horses for oxen. Bacon displayed remarkable foresight when he wrote, circa 1260, that "machines may be made by which the largest ships, with only one man steering them, will be moved faster than if they were filled with rowers; wagons may be built which will move with incredible speed and without the aid of beasts; flying machines can be constructed in which a man . . . may beat the air with wings like a bird . . . machines will make it possible to go to the bottom of seas and rivers" (as quoted in White [1962, p. 134]).

¹² But then, much the same was true of the first half century of "our" industrial revolution, which, until the coming of the railways, was centered on the production of cotton that perhaps constituted only some 7–8 percent of national output (Hobsbawm 1969, p. 68). Initially, the eighteenth-century industrial revolution was a very minor affair, at least in terms of investment levels and contributions to output and to growth in productivity (perhaps 0.3 percent per year) (see Landes 1969, pp. 64–65; Feinstein 1978, pp. 40–41; Williamson 1984).

eleventh-century living standards, much of the earlier population would surely have been condemned to starvation.

Still, the industrial activity of the twelfth and thirteenth centuries was very substantial. By the beginning of the fourteenth century, according to Gimpel (1976), 68 mills were in operation on less than one mile of the banks of the Seine in Paris, and these were supplemented by floating mills anchored to the Grand Pont. The activity in metallurgy was also considerable—sufficient to denude much of Europe of its forests and to produce a rise in the price of wood that forced recourse to coal (Nef [1934]; other historians assert that this did not occur to any substantial degree until the fifteenth or sixteenth century, with some question even about those dates; see, e.g., Coleman [1975, pp. 42–43]). In sum, the industrial revolution of the twelfth and thirteenth centuries was a surprisingly robust affair, and it is surely plausible that improved rewards to industrial activity had something to do with its vigor.

E. The Fourteenth-Century Retreat

The end of all this period of buoyant activity in the fourteenth century (see the classic revisionist piece by Lopez [1969] as well as Gimpel [1976, chap. 9]) has a variety of explanations, many of them having no connection with entrepreneurship. For one thing, it has been deduced by study of the glaciers that average temperatures dropped, possibly reducing the yield of crops (though recent studies indicate that the historical relation between climatic changes and crop yields is at best ambiguous) and creating other hardships. The plague returned and decimated much of the population. In addition to these disasters of nature, there were at least two pertinent developments of human origin. First, the church clamped down on new ideas and other manifestations of freedom. Roger Bacon himself was put under constraint.¹³ The period during which new ways of thinking brought rewards and status was apparently ended. Second, the fourteenth century included the first half of the devastating Hundred Years' War. It is implausible that the associated renewal of rewards to military enterprise played no part in the economic slowdown.

F. Remark on "Our" Industrial Revolution

It need hardly be added, in conclusion, that *the* industrial revolution that began in the eighteenth century and continues today has brought

¹³ The restraints imposed by the church had another curious effect: they apparently made bathing unfashionable for centuries. Before then, bathhouses had been popular as centers for social and, perhaps, sexual activity; but by requiring separation of the sexes and otherwise limiting the pleasures of cleanliness, the church undermined the inducements for such sanitary activities (see Gimpel 1976, pp. 87–92).

to the industrialist and the businessperson generally a degree of wealth and a respect probably unprecedented in human history. The fact that this period yielded an explosion of output at least equally unprecedented is undoubtedly attributable to a myriad of causes that can probably never be discovered fully and whose roles can never be disentangled. Yet the continued association of output growth with high financial and respectability rewards to productive entrepreneurship is surely suggestive, even if it can hardly be taken to be conclusive evidence for proposition 3, which asserts that the allocation of entrepreneurship *does* really matter for the vigor and innovativeness of an economy.

V. On Unproductive Avenues for Today's Entrepreneur: A Delicate Balance

Today, unproductive entrepreneurship takes many forms. Rent seeking, often via activities such as litigation and takeovers, and tax evasion and avoidance efforts seem now to constitute the prime threat to productive entrepreneurship. The spectacular fortunes amassed by the "arbitrageurs" revealed by the scandals of the mid-1980s were *sometimes*, surely, the reward of unproductive, occasionally illegal but entrepreneurial acts. Corporate executives devote much of their time and energy to legal suit and countersuit, and litigation is used to blunt or prevent excessive vigor in competition by rivals. Huge awards by the courts, sometimes amounting to billions of dollars, can bring prosperity to the victor and threaten the loser with insolvency. When this happens, it must become tempting for the entrepreneur to select his closest advisers from the lawyers rather than the engineers. It induces the entrepreneur to spend literally hundreds of millions of dollars for a single legal battle. It tempts that entrepreneur to be the first to sue others before those others can sue him. (For an illuminating quantification of some of the social costs of one widely publicized legal battle between two firms, see Summers and Cutler [1988].)

Similarly, taxes can serve to redirect entrepreneurial effort. As Lindbeck (1987, p. 15) has observed, "the problem with high-tax societies is not that it is impossible to become rich there, but that it is difficult to do so by way of productive effort in the ordinary production system." He cites as examples of the resulting reallocation of entrepreneurship " 'smart' speculative financial transactions without much (if any) contribution to the productive capacity of the economy" (p. 15) as well as "illegal 'business areas' such as drug dealing" (p. 25).

In citing such activities, I do not mean to imply either that rent-seeking activity has been expanding in recent decades or that takeover bids or private antitrust suits are always or even preponderantly unproductive. Rather, I am only suggesting where current rent-

seeking activities are likely to be found, that is, where policy designers should look if they intend to divert entrepreneurial talents into more productive channels.

The main point here is to note that threats of takeovers are sometimes used as a means to extract "greenmail" and that recourse to the courts as a means to seek to preserve rents through legally imposed impediments to competition does indeed occur, and to suggest that it is no rare phenomenon. This does, then, become an attraction for entrepreneurial talent whose efforts are thereby channeled into unproductive directions. Yet, to the extent that takeovers discipline inefficient managements and that antitrust intervention sometimes is legitimate and sometimes contributes to productivity, it would seem that it will not be easy to change the rules in a way that discourages allocation of entrepreneurial effort into such activities, without at the same time undermining the legitimate role of these institutions. Some promising proposals have been offered, but this is not a suitable place for their systematic examination. However, a few examples will be reported in the following section.

VI. Changes in the Rules and Changes in Entrepreneurial Goals

A central point in this discussion is the contention that if reallocation of entrepreneurial effort is adopted as an objective of society, it is far more easily achieved through changes in the rules that determine relative rewards than via modification of the goals of the entrepreneurs and prospective entrepreneurs themselves. I have even gone so far as to use the same terms to characterize those goals in the very different eras and cultures referred to in the discussion. But it would be ridiculous to imply that the attitudes of a wealth-seeking senator in Rome, a Sung dynasty mandarin, and an American industrialist of the late nineteenth century were all virtually identical. Still, the evidence suggests that they had more in common than might have been expected by the casual observer. However, even if it were to transpire that they really diverged very substantially, that would be of little use to the designer of policy who does not have centuries at his or her disposal and who is notoriously ineffective in engendering profound changes in cultural influences or in the structure of preferences. It is for this reason that I have chosen to take entrepreneurial goals as given and to emphasize modification in the structure of the rewards to different activities as the more promising line of investigation.

This suggests that it is necessary to consider the process by which those rules are modified in practice, but I believe that answers to even this more restricted question are largely beyond the powers of the

historians, the sociologists, and the anthropologists into whose domains it falls. One need only review the disputatious literature on the influences that led to the revival of trade toward the end of the early Middle Ages to see how far we still are from anything resembling firm answers. Exogenous influences such as foreign invasions or unexpected climatic changes can clearly play a part, as can developments within the economy. But the more interesting observation for our purposes is the fact that it is easy to think of measures that *can* change these rules quickly and profoundly.¹⁴

For example, the restrictions on royal grants of monopolies imposed by Parliament in the Statute of Monopolies are said to have reduced substantially the opportunities for rent seeking in seventeenth- and eighteenth-century England and may have moved reluctant entrepreneurs to redirect their efforts toward agricultural improvement and industry. Even if it did not succeed to any substantial extent in reallocation of the efforts of an unchanged body of entrepreneurs from one of those types of activity to the other, if it increased failure rates among the rent seekers while not impeding others who happened to prefer productive pursuits, the result might have been the same. Similarly, tax rules can be used to rechannel entrepreneurial effort. It has, for instance, been proposed that takeover activity would be reoriented substantially in directions that contribute to productivity rather than impeding it by a "revenue-neutral" modification in capital gains taxes that increases rates sharply on assets held for short periods and decreases them considerably for assets held, say, for 2 years or more. A change in the rules that requires a plaintiff firm in a private antitrust suit to bear both parties' legal costs if the defendants are found not to be guilty (as is done in other countries) promises to reduce the frequency with which such lawsuits are used in an attempt to hamper effective competition.

As has already been said, this is hardly the place for an extensive discussion of the design of rational policy in the arena under consideration. The objective of the preceding brief discussion, rather, has been to suggest that there are identifiable means by which the rules of the game can be changed effectively and to illustrate these means concretely, though hardly attempting to offer any generalizations about their character. Certainly, the few illustrations that have just been offered should serve to confirm that there exist (in principle)

¹⁴ Of course, that still leaves open the critical metaquestion, How does one go about changing the society's value system so that it will *want* to change the rules? But that is not the issue with which I am grappling here, since I see no basis on which the economist can argue that society *ought* to change its values. Rather, I am positing a society whose values lead it to favor productivity growth and am examining which instruments promise to be most effective in helping it to pursue this goal.

testable means that promise to induce entrepreneurs to shift their attentions in productive directions, *without any major change in their ultimate goals*. The testability of such hypotheses indicates that the discussion is no tissue of tautologies, and the absence of references to the allocability of entrepreneurship turned up in extensive search of the literature on the entrepreneur suggests that it was not entirely self-evident.

VII. Concluding Comment

There is obviously a good deal more to be said about the subject; however, enough material has been presented to indicate that a minor expansion of Schumpeter's theoretical model to encompass the determinants of the *allocation* of entrepreneurship among its competing uses can enrich the model considerably and that the hypotheses that have been associated with the model's extension here are not without substance, even if none of the material approaches anything that constitutes a formal test of a hypothesis, much less a rigorous "proof." It is also easy to confirm that each of the hypotheses that have been discussed clearly yields some policy implications.

Thus clear guidance for policy is provided by the main hypothesis (propositions 1–3) that the rules of the game that specify the relative payoffs to different entrepreneurial activities play a key role in determining whether entrepreneurship will be allocated in productive or unproductive directions and that this can significantly affect the vigor of the economy's productivity growth. After all, the prevailing laws and legal procedures of an economy are prime determinants of the profitability of activities such as rent seeking via the litigative process. Steps such as deregulation of the airlines or more rational antitrust rules can do a good deal here.

A last example can, perhaps, nail down the point. The fact that Japan has far fewer lawyers relative to population and far fewer lawsuits on economic issues is often cited as a distinct advantage to the Japanese economy, since it reduces at least in part the quantity of resources devoted to rent seeking. The difference is often ascribed to national character that is said to have a cultural aversion to litigiousness. This may all be very true. But closer inspection reveals that there are also other influences. While in the United States legal institutions such as trebled damages provide a rich incentive for one firm to sue another on the claim that the latter violated the antitrust laws, in Japan the arrangements are very different. In that country any firm undertaking to sue another on antitrust grounds must first apply for permission from the Japan Fair Trade Commission. But

such permission is rarely given, and, once denied, there is no legal avenue for appeal.

The overall moral, then, is that we do not have to wait patiently for slow cultural change in order to find measures to redirect the flow of entrepreneurial activity toward more productive goals. As in the illustration of the Japanese just cited, it may be possible to change the rules in ways that help to offset undesired institutional influences or that supplement other influences that are taken to work in beneficial directions.

References

- Abramovitz, Moses. *Thinking about Growth, and Other Essays of Economic Growth and Welfare*. New York: Cambridge Univ. Press, 1989.
- Ashton, Thomas S. *The Industrial Revolution, 1760–1830*. London: Oxford Univ. Press, 1948.
- Balazs, Etienne. *Chinese Civilization and Bureaucracy: Variations on a Theme*. New Haven, Conn.: Yale Univ. Press, 1964.
- Berman, Constance H. "Medieval Agriculture, the Southern French Countryside, and the Early Cistercians: A Study of Forty-three Monasteries." *Trans. American Philosophical Soc.* 76, pt. 5 (1986).
- Bloch, Marc. "Avènement et conquêtes du moulin à eau." *Annales d'Histoire Économique et Sociale* 7 (November 1935): 538–63.
- Braudel, Fernand. *Civilization and Capitalism, 15th–18th Century*. Vols. 2, 3. New York: Harper and Row, 1986.
- Brooke, Christopher N. L. *Europe in the Central Middle Ages, 962–1154*. London: Longman, 1964.
- Carus-Wilson, Eleanor M. "An Industrial Revolution of the Thirteenth Century." *Econ. Hist. Rev.* 11, no. 1 (1941): 39–60.
- Coleman, Donald C. "Industrial Growth and Industrial Revolutions." *Economica* 23 (February 1956): 1–22.
- . *Industry in Tudor and Stuart England*. London: Macmillan (for Econ. Hist. Soc.), 1975.
- Cowdrey, H. E. J. "The Peace and the Truce of God in the Eleventh Century." *Past and Present*, no. 46 (February 1970), pp. 42–67.
- Dasgupta, Partha. "Patents, Priority and Imitation or, the Economics of Races and Waiting Games." *Econ. J.* 98 (March 1988): 66–80.
- de Roover, Raymond. "The Commercial Revolution of the 13th Century." In *Enterprise and Secular Change: Readings in Economic History*, edited by Frederic C. Lane and Jelle C. Riemersma. London: Allen and Unwin, 1953.
- Douglas, David C. *William the Conqueror: The Norman Impact upon England*. Berkeley: Univ. California Press, 1964.
- Feinstein, C. H. "Capital Formation in Great Britain." In *The Cambridge Economic History of Europe*, vol. 8, pt. 1, edited by Peter Mathias and M. M. Postan. Cambridge: Cambridge Univ. Press, 1978.
- Finley, Moses I. "Technical Innovation and Economic Progress in the Ancient World." *Econ. Hist. Rev.* 18 (August 1965): 29–45.
- . *The Ancient Economy*. 2d ed. London: Hogarth, 1985.
- Forbes, Robert J. *Studies in Ancient Technology*. Leiden: Brill, 1955.

- Gimpel, Jean. *The Medieval Machine: The Industrial Revolution of the Middle Ages*. New York: Holt, Reinhart and Winston, 1976.
- Ho, Ping-Ti. *The Ladder of Success in Imperial China, 1368–1911*. New York: Columbia Univ. Press, 1962.
- Hobsbawm, Eric J. *Industry and Empire from 1750 to the Present Day*. Harmondsworth: Penguin, 1969.
- Jones, Eric L. *The European Miracle: Environments, Economies, and Geopolitics in the History of Europe and Asia*. Cambridge: Cambridge Univ. Press, 1987.
- Landes, David S. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*. New York: Cambridge Univ. Press, 1969.
- Lefebvre, Georges. *The Coming of the French Revolution, 1789*. Princeton, N.J.: Princeton Univ. Press, 1947.
- Lindbeck, Assar. "The Advanced Welfare State." Manuscript. Stockholm: Univ. Stockholm, 1987.
- Liu, James T. C., and Golas, Peter J., eds. *Change in Sung China: Innovation or Renovation?* Lexington, Mass.: Heath, 1969.
- Lopez, Robert S. "Hard Times and Investment in Culture." In *The Renaissance: A Symposium*. New York: Oxford Univ. Press (for Metropolitan Museum of Art), 1969.
- McNeill, William H. *History of Western Civilization*. Rev. ed. Chicago: Univ. Chicago Press, 1969.
- Marsh, Robert M. *The Mandarins: The Circulation of Elites in China, 1600–1900*. Glencoe, Ill.: Free Press, 1961.
- Milward, Alan S. *The Economic Effects of the Two World Wars on Britain*. London: Macmillan (for Econ. Hist. Soc.), 1970.
- Murphy, Kevin M.; Shleifer, Andrei; and Vishny, Robert. "The Allocation of Talent: Implications for Growth." Manuscript. Chicago: Univ. Chicago, 1990.
- Needham, Joseph. "Mathematics and Science in China and the West." *Science and Society* 20 (Fall 1956): 320–43.
- Nef, John U. "The Progress of Technology and the Growth of Large-Scale Industry in Great Britain, 1540–1640." *Econ. Hist. Rev.* 5 (October 1934): 3–24.
- North, Douglass C., and Thomas, Robert Paul. *The Rise of the Western World: A New Economic History*. Cambridge: Cambridge Univ. Press, 1973.
- Olson, Mancur. *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*. New Haven, Conn.: Yale Univ. Press, 1982.
- Ovitt, George, Jr. *The Restoration of Perfection: Labor and Technology in Medieval Culture*. New Brunswick, N.J.: Rutgers Univ. Press, 1987.
- Painter, Sidney. *William Marshal: Knight-Errant, Baron, and Regent of England*. Baltimore: Johns Hopkins Press, 1933.
- Robinson, Joan. *The Economics of Imperfect Competition*. London: Macmillan, 1933.
- Rosenberg, Nathan, and Birdzell, L. E., Jr. *How the West Grew Rich: The Economic Transformation of the Industrial World*. New York: Basic Books, 1986.
- Rubinstein, W. D., ed. *Wealth and the Wealthy in the Modern World*. London: Croom Helm, 1980.
- Schama, Simon. *Citizens: A Chronicle of the French Revolution*. New York: Knopf, 1989.
- Schumpeter, Joseph A. *The Theory of Economic Development*. Leipzig: Duncker and Humblot, 1912. English ed. Cambridge, Mass.: Harvard Univ. Press, 1934.

- Smith, Adam. *An Inquiry into the Nature and Causes of the Wealth of Nations*. 1776. Reprint. New York: Random House (Modern Library), 1937.
- Stone, Lawrence. "The Bourgeois Revolution of Seventeenth-Century England Revisited." *Past and Present*, no. 109 (November 1985), pp. 44–54.
- Summers, Lawrence, and Cutler, David. "Texaco and Pennzoil Both Lost Big." *New York Times* (February 14, 1988).
- Thirsk, Joan. "The Restoration Land Settlement." *J. Modern Hist.* 26 (December 1954): 315–28.
- Veblen, Thorstein. *The Theory of Business Enterprise*. New York: Scribner, 1904.
- Veyne, Paul. "Vie de trimalcion." *Annales: Économies, Sociétés, Civilisations* 16 (March/April 1961): 213–47.
- White, Lynn T., Jr. *Medieval Technology and Social Change*. Oxford: Clarendon, 1962.
- Williamson, Jeffrey G. "Why Was British Growth So Slow during the Industrial Revolution?" *J. Econ. Hist.* 44 (September 1984): 687–712.