Bringing Entrepreneurship and Innovation into the Theory of Value

I am an invisible man. No, I am not a spook like those who haunted Edgar Allan Poe; nor am I one of your Hollywood-movie ectoplasms. I am a man of substance, of flesh and bone, fiber and liquids—and I might even be said to possess a mind. I am invisible, understand, simply because people refuse to see me. . . . When they approach me they see only my surroundings, themselves, or figments of their imagination—indeed, everything and anything except me.

—Ralph Ellison, *Invisible Man* (1952, 3)

THE INVISIBLE ENTREPRENEUR

My belief, delusory or not, is that I provide here the first quasi-formal, theoretical analysis of the role and activities of the *innovative* entrepreneur—an entrée into the elementary theory of value.[1] Through this book, I hope to introduce innovative entrepreneurship into the accepted body of mainstream microtheory.

However, this effort should also not be taken to imply that there exists no valuable research on the subject, or even that nontheoretical work on this topic is lacking. On the contrary, there is a profuse and rapidly growing body of empirical research—much of it imaginative, highly competent, and illuminating.[2] This work has begun to show, for example, the type of person most likely to become an innovating entrepreneur, the sources of financing available for this entrepreneurial activity, the institutional arrangements that stimulate it, the economic value of entrepreneurship, and a good deal more.[3]

In addition, as the reader need hardly be reminded, there is an invaluable macroeconomic literature on economic growth, stemming from the

work of Robert Solow and including the writings of Paul Romer and Robert Lucas and, more recently, the outstanding volume by Philippe Aghion and Peter Howitt (1998). In these macrotheoretic writings, entrepreneurs usually lurk in the background—largely concealed, but present under certain interpretations. Finally, there also is a considerable body of microtheoretic work in the arena of invention, including the pathbreaking analyses of Karl Shell.

It is clear, then, that work much more profound than mine has been provided by others in more sophisticated and advanced theories of innovation that have indirect implications for the theory of entrepreneurship. Even more extensive is the fine body of empirical work on the subject provided by economists and sociologists, among others. But despite the existing literature and near universal acknowledgment of the entrepreneur's crucial contribution to economic growth and the general welfare, theoretical material on entrepreneurship has not yet become a required component of all training in microtheory, nor has it become a mandatory portion of every elementary textbook. In fact, the word fails to appear in the indices of many such textbooks.

Thus, even the valuable empirical and theoretical work in the microeconomic arena, to which I have just alluded, does not meet the goals of this book, for it lies outside the mainstream of basic microtheory. The theory of entrepreneurship does not go totally unrecognized or unappreciated in discussions of growth, but it remains relegated to the suburbs of the microeconomic literature. As things stand, few of us who teach economics, in designing a one-semester course on the theory of the firm, would be expected to assign much time to the writings noted in the previous paragraphs. Although few deny the importance of the entrepreneurs and many acknowledge their critical role, they are almost entirely excluded from our standard theoretical models of the firm.

There are obvious reasons why this state of affairs should be considered curious. Entrepreneurs seem to be widely recognized as prime contributors to economic progress. However, it also should be obvious that the current state of economic welfare and standard of living in industrialized economies owes vastly more to the market mechanism's past growth performance than it does to any static efficiency contributions for which it is arguably responsible. Thus, there is little reason to expect the need for the work of entrepreneurs to diminish substantially in the foreseeable future. Despite this, our lectures on microtheory of the firm and its contribution to economic welfare focus almost exclusively on the static side of the latter. Surely, something here is out of order.

The nearly exclusive focus by welfare economics literature on those "market failures" that are static in character—monopoly, externalities of the type usually cited, inadequate output of public goods, and the like—

Table I.1
Rise in Real Per Capita GDP, 1900–2001

|	% Rise	Multiple
U.S.	583	6.83
France	633	7.33
Japan	1,653	17.53
Sweden	703	8.03
U.K.	348	4.48
Italy	967	10.67
Germany	526	6.26

Source: Maddison 2003.

is entirely indefensible because it neglects the welfare implication of micro-activities related to economic growth. The result is, arguably, a serious misallocation of classroom time and textbook space, in which a markedly excessive share is allotted to the stationary analysis, as will be argued next.

GROWTH: THE SIGNIFICANT SOURCE OF ENHANCED GENERAL WELFARE

It seems not very difficult to indicate, albeit in imperfectly rigorous terms, something a bit more specific about the relative importance of the statics and dynamics of policy for the economic well-being of the general public. For this purpose, let us begin by taking note of some important data estimates: the evaluation of the magnitude of growth in per capita income. Perhaps the most conservative estimate of the rate of expansion of per capita real income in the past century is offered by Maddison (2003), who reports that this increased nearly sevenfold in the United States—surely an impressive number (see table I.1). Roughly speaking, this means that in 1900, average per capita income was a bit more than $5,000 per year (in 2000 dollars)—a standard of living that is virtually impossible to comprehend today. Several other estimates of twentieth-century growth are far higher. Alan Greenspan, for example—who is not noted for exaggeration in his data estimates, is reported by DeLong (2000) to have concluded that the true figure is something like a thirtyfold rise.

   In order to analyze what this implies for our subject, I will employ a conservative approach, taking the lower (near sevenfold) multiplication
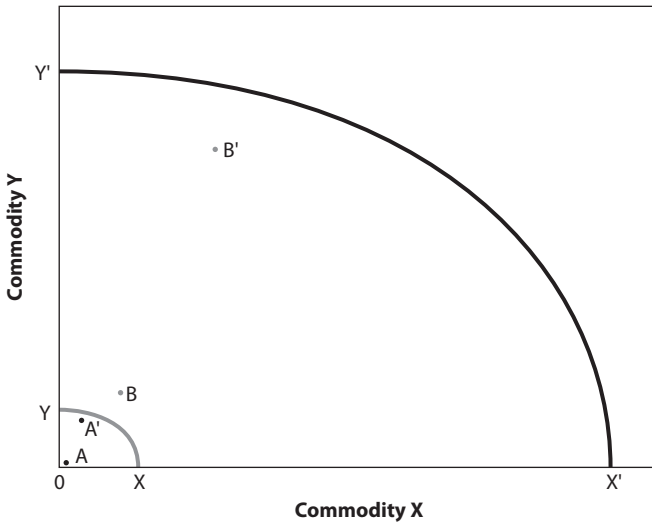
FIGURE I.1

Hypothetical Progress, 1900–2000: Elimination of Monopoly Power vs. Innovation

to be correct. Figure I.1 represents such an increase via two hypothetical production-possibility frontiers, *XY* and *X'Y'* (in two commodities). The frontiers are drawn as replicas of one another, except that *X'Y'* is magnified sevenfold and, therefore, placed seven times as far from the origin as *XY*. The frontier of 1900 is represented by *XY*, while *X'Y'* signifies that of 2000.

Next, consider what a plausible increase in *static* efficiency could possibly have contributed to welfare, starting from the earlier date. We can, of course, take as the hypothetical initial position any point below the 1900 frontier, *XY*. However, in order to remain conservative, I select point *A*, which lies well below the 1900 frontier, as the initial position of the economy. This is a conservative assumption in that static inefficiency is taken to be implausibly enormous, leaving extensive room for improvement via static efficiency contributing measures. That is, under this premise, any move from *A* to anywhere on the *XY* frontier must be feasible.

In contrast, a sevenfold increase in every output from point *A*, permitted by the twentieth-century *growth* performance, brings us all the way from point *A* to point *B*—well beyond the 1900 frontier, *XY*. The disparity between the possible static change and the change made possible by growth is apt to be huge because the largest possible improvement in welfare at that date cannot take us any higher than some point on the

(very low) 1900 boundary, which determines the maximal improvement technologically feasible at that time.

It is also illuminating to consider the implications of an alternative, initial 1900 position, point A', that already represents a state of relatively abundant welfare for that time, since A' lies very close to the 1900 frontier. Because point A' has far greater proximity to the 1900 frontier, as compared with point A, A' will have far greater static efficiency than A. With initial point A', the disparity between a move to the static frontier and the alternative contribution of growth to corresponding point B' of year 2000 is enormously larger than that permitted by point A. This is because point A' is already close to the frontier, so there is comparatively little room for contribution by *static*-efficiency increasing measures. Thus, my choice of A as the illustrative initial position can indeed be considered conservative.

In other words, if we take the position of those who believe that the performance of the unconstrained market is reasonably close to optimality, then there is necessarily an enormous excess of the welfare contribution offered by growth over anything a set of static programs can possibly provide.

The empirical evidence we do have appears to suggest that point A' in the graph is much closer to a true depiction of reality than point A. Although it has elicited a fair amount of criticism and reservations, the most noted evidence on the subject is that provided in Harberger's classic discussion (1954, 524), which concludes that "elimination of resource misallocation in American manufacturing in the late twenties would bring with it an improvement in consumer welfare of little more than a tenth of a percent [!] in present value. This welfare gain would amount to about $2.00 per capita." This astonishing estimate suggests that even point A' in the graph is far further from the frontier than it would be in reality.

More conservative studies raise the estimated figure for static efficiency gains from antitrust and regulatory activities, alone, to about 1 percent of GDP. This is easily shown to mean that, if we had completely eliminated all market failure attributable to imperfect competition, but the economy had failed to grow, the accumulated year-by-year gains from eliminating monopolistic distortions would have added up to about $5,000 per person over the entire twentieth century. The opportunity cost, in the form of the foregone accumulation of the benefits of growth (adding together the year-by-year gains), would have totaled about 300 times that amount—an incredible $1,500,000 per person (roughly) over the course of the century.

Other evidence also suggests that significant improvements in welfare have derived from the activities of entrepreneurs when they have devoted themselves to productive activities. Take, for instance, figure I.2, which
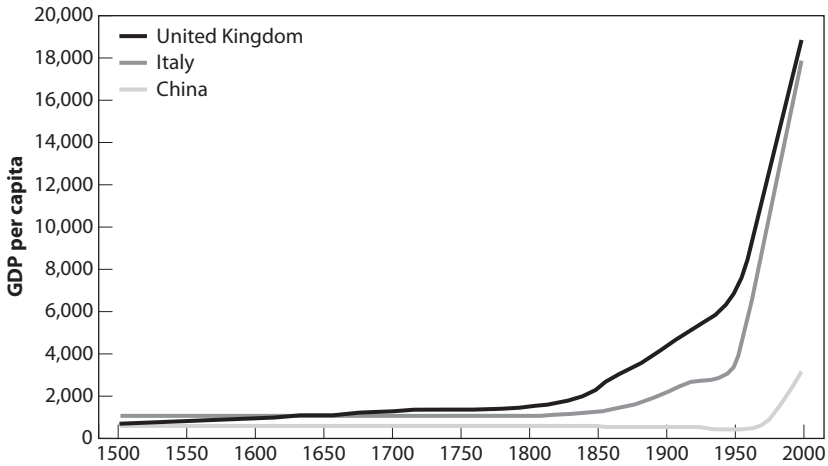
FIGURE I.2
GDP Per Capita, 1500–2006: China, Italy, and the United Kingdom (1990 inter-national $). (Source: Maddison 2001, 264.)

shows the record of productivity growth over a 500-year period for China, Italy, and the United Kingdom.

Between 1500 and the middle of the eighteenth century, the curves representing the levels of per capita gross domestic product (GDP) in the three countries are virtually horizontal—a striking record of progress at a snail's pace.[4] But from then on, it is clear that the rate of improvement grows ever faster, until the curves jut sharply upward, and China's growth rate pulls ahead of both the U.K. and Italy in the second half of the twentieth century, as figure I.3 shows.[5]

What is striking here is the poor economic performance of China—until the late twentieth century, when its explosive productivity growth occurred.[6] That is, the recent explosion in output contrasts dramatically with China's earlier centuries of astonishing invention, which failed to produce anything like Western growth after the Industrial Revolution. One can argue that the extended medieval period in China was characterized by profusion of inventors, but with entrepreneurs seeking roles in the bureaucracy, rather than in industry. In contrast, in recent decades, entrepreneurship in China has directed itself to the business sector, while accompanied by no innovation comparable to its incredible earlier performance.

Add to this the more dramatic contributions of growing prosperity—for example, the striking increase in longevity that has doubled life expectancy at birth and the elimination of European famine that, until the end of the
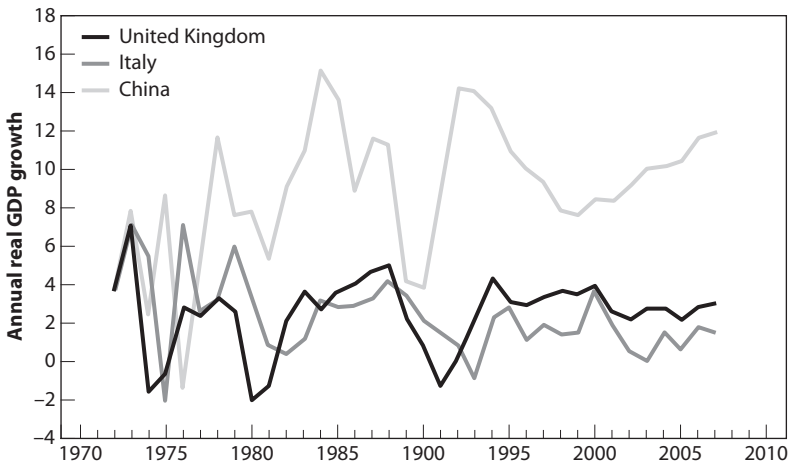
FIGURE I.3
Annual Real GDP Growth, 1972–2007: China, Italy, and the United Kingdom.
(Source: Organization for Economic Cooperation and Development 2009.)

eighteenth century, occurred every decade, on average, and it becomes difficult not to acknowledge the enormously unmatched contribution to the general welfare of economic growth and, by implication, the critical role of the entrepreneur in this achievement.

THE OVERALL IMPLICATION

It appears evident that the really significant payoff to welfare economics lies in intertemporal, rather than stationary, analysis. One of the aims of this book is to suggest how a move in this direction can be carried out; another is to derive some pertinent results that fall within the domain of the welfare economics of growth.

Here there is one important exception: externalities. Static externalities can threaten enormous damage to the general welfare, as in the case of global warming. Still, where else are externalities more enormous than in the case of the huge spillovers from innovation? Consequently, we will pay attention to them in several of the chapters that follow.

However, the conclusions that emerge here will be far from the usual ones. Instead, I will argue that, unlike other externalities that invariably result in welfare-damaging market failure, the externalities of innovation have made an enormously beneficial distributive contribution to the general

welfare. While the result may not pass any formal test of approximation to allocative efficiency, it nevertheless may be considered to be very desirable on the whole—most notably in its contribution to the reduction of poverty. In addition, I will show that in much of the affected economic activity, the market mechanism provides strong incentives for business firms to undertake *voluntary* actions that incidentally support and enhance this externality in a manner that is socially beneficial.

In sum, this book emphasizes the importance of redirecting microeconomic analysis from statics toward dynamics, as well as restoring attention to entrepreneurship, the much neglected, fourth "factor of production."