William J. Baumol has made an impressive number of important contributions to our understanding of entrepreneurship. This article presents an interview in which Baumol discusses the role and importance of innovation in the economy, as well as his views on methodological and pedagogical issues. In addition to summarizing briefly Baumol's classic argument on productive, unproductive, and destructive entrepreneurship, the article highlights some areas of his work that are less known among entrepreneurship scholars. In particular, the article discusses Baumol's work on economic growth and his theory of contestable markets. Both topics offer fruitful research venues for those interested in the relationship between strategic entrepreneurship, market entry, and innovation. Copyright © 2016 Strategic Management Society.

INTRODUCTION

In 2003, the Swedish Foundation for Small Business Research and the Swedish Board of Industrial and Technical Development awarded the International Award for Entrepreneurship and Small Business Research to William J. Baumol.¹ In 2014, the Entrepreneurship Division of the Academy of Management awarded him the Foundational Paper Award.² While these prestigious recognitions (to cite two among the many he has received) acknowledge and celebrate Baumol’s contribution to our understanding of entrepreneurship, they do not sufficiently convey the magnitude and importance of such contribution. With more than 50 authored books and more than 500 articles in leading journals, Baumol is undoubtedly one of the foundational figures of the field.

William J. Baumol was born on February 26, 1922, in the Bronx, New York. He attended public schools in New York City and received his undergraduate degree from the College of the City of New York. After a few years working at the U.S. Department of Agriculture and after getting out of the army in 1946, Baumol attended the London School of Economics, where he received a PhD in economics in 1949 working with Lionel Robbins. Upon graduation, he joined the department of economics at Princeton University, where he worked closely with economists such as Jacob Viner and Lester Chandler and mathematicians such as Harold Kuhn and Albert Tucker. In 1971, Baumol accepted a joint appointment with New York University and

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²The Prize citation reads: ‘His insistence that the entrepreneurs should have a key role in the theory of the firm; ‘his studies of the role of institutions for the channeling of entrepreneurship into productive use;’ and ‘his early formulation of a competition policy emphasizing the disciplinary effect of dynamic entrepreneurship.’

begun splitting his time between the two schools. After a long and remarkably productive academic career, William J. Baumol retired from Princeton in 1991 after 42 years of service and from New York University in 2014 after 43 years of service. He is now Professor Emeritus at NYU and continues living and working in his native New York City.\(^3\)

Today, in the field of entrepreneurship, we associate Baumol’s work primarily with his classic article on productive, unproductive, and destructive entrepreneurship (Baumol, 1990). The paper is highly cited and has inspired a significant amount of research in entrepreneurship. Yet, there is much more to Baumol and has inspired a significant amount of research in entrepreneurship (Baumol, 1990). The paper is highly cited productive, unproductive, and destructive entre-

REPLICATIVE AND INNOVATIVE ENTREPRENEURS

For more than four centuries, economists have developed the theory of entrepreneurship. Cantillon (1755) identified the willingness to bear the personal financial risk of a business as the defining characteristic of an entrepreneur. Say (1803) stressed the role of the entrepreneur in creating value by moving resources from less productive to more productive activities. Mill (1848) described the entrepreneur as someone who assumes both the risk and management of a business, thereby making explicit the distinction between the entrepreneur and other business owners. Finally, Schumpeter (1947) stressed the role of the entrepreneur as an innovator and a disruptive economic force, since the introduction of innovations leads to the obsolescence of existing products and markets.

From the 1960s, however, most economists began focusing on formal models in which entrepreneurship is implicitly subsumed under technological innovation. There were, of course, exceptions. Among them, Kirzner and Baumol emerged as the most notable. They are recognized as the main architects of the resurgence of interest in entrepreneurship recently observed in economics. Their work has inspired much of the significant amount of research developed in recent years on the economics of entrepreneurship (see Parker, 2009, for a comprehensive bibliography and extensive review of this literature). Within the context of the Austrian school, Kirzner (1973, 1979) emphasized the encompassing nature of entrepreneurial alertness as the mechanism that creates new ends-means relationships. Baumol, too, put the entrepreneur at the center of the market. However, he also reconciled the classical tradition with the neoclassical methodological developments of the 1980s by introducing the distinction between replicative and innovative entrepreneurs.\(^5\)

\(^3\) For more bibliographic details on Baumol’s interesting life, see Krueger’s (2001) very enjoyable article and Griffiths et al. (2012). Readers interested in learning more about Baumol’s work will find a concise (albeit not up to date) overview in Bailey and Willig (1992). A summary of his contributions to entrepreneurship researchers. In addition, I hope to show how, throughout his work, Baumol put innovation and the entrepreneur who brings it to the market, at the center of the whole economic system and at the origin of economic growth. During his long and prolific career, Baumol never lost sight of what matters: his preoccupation remained the elimination of poverty and the belief that innovative entrepreneurs are the only people who can reduce it. But innovation and innovative entrepreneurs are elusive. In Baumol’s vision, our fundamental quest is, in his own words, ‘to invent the analysis of invention.’

The rest of the article is organized around a conversation I had with Professor Baumol in his Manhattan apartment, other personal exchanges we have had over the years, and my own reading and interpretation of his work. Our recent conversation spanned entrepreneurship, innovation, poverty, history, and pedagogical issues, and it illustrates his views on these topics as well as describes his more recent research interests. Professor Baumol’s answers are all presented verbatim with only minimal editorial changes, which are included in square brackets.\(^4\) While it is impossible to do justice to the scope and applications of his work in a single article, my goal is to highlight some of William Baumol’s contributions in areas that are of interest to the readership of this journal, such as entrepreneurship and innovation and his methodological insights, as well as suggest ways we can build upon them to push the boundaries of the field forward.

\(^4\) Because of space constraints, I do not report the entire conversation. Also, to enhance the coherence of the overall argument, the sequence of questions has been slightly modified from the original. A copy of the original recording has been made available to the editors. Kalindi Dinoffer transcribed the interview.

\(^5\) Throughout his writing, Baumol uses different (although largely overlapping) terminology to distinguish between replicative and innovative entrepreneurs. For example, in his 1993a paper, he uses the terms ‘firm-organizing entrepreneur’ and ‘Schumpeterian-innovating’ entrepreneur. In other cases, he uses ‘imitative’ and ‘innovating.’ For consistency, in this article, I use the terminology he chose to use during our conversation.
Innovative entrepreneurship refers to the introduction of products and production techniques that were not available before. Replicative entrepreneurship, instead, refers to the diffusion of these innovations after their utility has been demonstrated by the innovators.\(^6\) I asked Baumol to describe his view of the entrepreneur.

Minniti (M thereafter): In many of your writings related to entrepreneurship, you have made a sharp distinction between replicative and innovative entrepreneurs. Does the importance of this distinction rest on the fact that the latter generates productivity changes?

Baumol (B thereafter): That’s right. And I would say this: for short-run problems like a recession, you need the replicative entrepreneurs above all. The people who are jobless, they can open a little shop and make it work, even if there are a thousand other little shops like it. He’s no longer losing his house, or whatever, but he is not increasing the productivity of the economy. But, if you are going to get rid of the poverty of Africa and Latin America, that isn’t enough. That’s where you need the breakthroughs that change productivity and that have increased real per capita income in the United States over a century by a factor of six or seven. I mean, these are things neither you nor I can imagine. What was it like to live when you had one-sixth of the purchasing power today in your weekly salary, in your bank account, in any other source of funding? And not just numbers, but actually in terms of real purchasing power. It is totally incredible to us.

M: Still, don’t you agree that the adoption of innovation developed elsewhere increases the standard of living in those countries enormously?

B: Oh yes, oh yes! You’ve caught the point exactly. So you need them both. And one (replicative entrepreneurship), we know how to teach at least pretty well. I’m not saying that we have the final answer. The other we do not know...And the whole point in studying innovative entrepreneurship is that is the only way by which humanity has ever reduced poverty over broad stretches of geography. And the thing is that you need that sort of activity in Africa, in Latin America. China has learned about it. See, China now is inventing very little. It used to be the leader of the world in invention, but it had no entrepreneurs who dared to bring these things to market because they feared what the emperor would do. Now it’s the opposite. The government is encouraging the Chinese entrepreneurs to learn from Italy, from France, from the United States, and take the ideas and produce them a little more cheaply, a little more prettily, whatever, and in that way they are catching up, but they will also run into trouble. Because as Jean Baptiste Say said in 1803, you need all three of them: you need the inventor, you need the manufacturer, and you need the entrepreneur to bring them together. So China today is well supplied with entrepreneurs. Though I have in one paper that was sent to me from China an estimate than more than half of the Chinese billionaires are in prison. Literally. I mean that’s still not the right way to do it.

Thus, according to Baumol, both types of entrepreneur are important for the performance of the economy, but they differ profoundly in their roles, the nature of their influence, and the type of analysis their role requires. Baumol’s distinction among entrepreneurial types also has important methodological implications. Baumol (1968: 66) famously wrote that ‘the theoretical firm is entrepreneurless—the Prince of Denmark has been expunged from the discussion of Hamlet.’ As a result, he is sometimes incorrectly cited as having argued that formal economic models are not suitable to study entrepreneurship. However, this is inaccurate, as he never made that claim.\(^7\) In Baumol’s view, the process of replicative entrepreneurship can be described formally and its requirements of optimality in decision making can be usefully determined. But, the range of options available to the innovative entrepreneur at any given time is unknown, and the consequences of any decision (and the resulting outcomes) is unexplored and unknowable. As a result, the calculation of optimality conditions is not feasible.

Much of the standard theory of the firm is based on the premise of optimization. Firms are viewed as profit-maximizing agencies able to plan optimal inventories, hire the optimal number of employees, and produce the products that optimize their market position. This approach to the theory of the firm provides a number of surprising results and useful applications as tools for consulting and management.

\(^6\) It is easy to interpret this distinction as akin to that between Schumpeterian innovators and Kirznerian arbitrageurs. This, however, would be incorrect since Kirzner’s concept of alert arbitrageurs is very broad and Schumpeterian innovators can be viewed as a subset of the latter (Koppl and Minniti, 2010).

\(^7\) Baumol is one of the main scholars responsible for popularizing the use of mathematical modeling in economics and the social sciences (Eliasson and Henrekson, 2004). For some examples of his early work based on the use of mathematical methods see, among other publications, Baumol (1966, 1964).
Thus, Baumol argues, optimization models provide a rich treatment of the replicative entrepreneur. For example, in Williamson’s (1985) transactions-cost analysis, the important problems of negotiating contracts and organizational structure are represented with acts of optimizing calculations. Even if, in reality, the replicative entrepreneur’s decisions are not necessarily optimal, this representation serves as an important guide for the improvement of those decisions. However, this is precisely why optimization models may not be suitable to describe the innovative entrepreneur.

As Baumol (1993a: 200) argues, ‘because it must constantly change, we have difficulty in providing any sort of general description of what [the innovative entrepreneur] does, except in the broadest and generic of terms...And that largely rules out systematic optimization calculations.’ While it is possible to describe ex post what an innovative entrepreneur did in the past, Baumol (1993a) admonishes, that description, necessarily, can explain only an activity that would qualify as innovative entrepreneurship at the time, but it is no longer so and, if re-enacted, could be viewed only as replicative entrepreneurship. The acts of innovating entrepreneurs entail the introduction of something unprecedented and unexpected that cannot be easily formalized. According to Baumol, the mechanism set in motion by innovation creates incentives for further innovations, and this is the activity at the center of productivity increases and economic growth.8

Baumol’s view, which he further develops in his theory of contestable markets, points out that innovative entrepreneurs are not casual contributors of new products and services but, individuals who are forced to maintain the flow of innovation in order to protect their entrepreneurial rents. Thus, in addition to clarifying the emphasis he puts on distinguishing the replicative from the innovative entrepreneur, Baumol’s methodological distinction underlies the important point that innovative entrepreneurship is incomputable in nature and, therefore, cannot be planned (Koppl, 2008). Furthermore, Baumol’s position on the formalization of entrepreneurship at the individual level highlights how his analysis of the innovative entrepreneur links organically to his work on institutions and aggregate economic activity (Baumol, 1990).

**ENTREPRENEURSHIP: PRODUCTIVE, UNPRODUCTIVE, DESTRUCTIVE**

In one of the most widely cited papers in the entrepreneurship literature, Baumol (1990) provides a typology of entrepreneurship based on the unintended consequences of individual action at the aggregate level and links explicitly the quality of institutions to the distribution of entrepreneurial activity across different types. Baumol’s contribution is significant because it fundamentally shifts the focus of academic inquiry toward the role institutions have on entrepreneurship. While Baumol’s (1993a) individual-level analysis focuses on the characteristics of the activity, whether innovative or replicative, and their relative effects on productivity, his 1990 paper reverses the causal linkage and focuses on the effect the macroeconomic environment has on entrepreneurship.

In his theory, Baumol makes a distinction between the total supply of entrepreneurs and the allocation of entrepreneurs between productive and unproductive activities. When comparing different countries or geographic areas, he argues, there are factors that may influence the total supply of entrepreneurs, for example, the age distribution, the income, or the education level of the population. Governments have limited ability to influence the size of this total supply, at least in the short run. Within a specific geographic area, however, governments do have the power to influence how this total supply of entrepreneurship is distributed across alternative economic functions. This is the case because changes in the allocation of entrepreneurial talent are largely caused by the incentive structure, not by the population’s underlying propensity to be entrepreneurial. Governments do have the power to alter those incentives. Thus, Baumol makes a fundamental distinction between overall supply and distribution of that supply across entrepreneurial types, which he then classifies as productive, unproductive, and destructive.

Baumol’s productive entrepreneurship is based on the Schumpeterian description of entrepreneurship and refers to the ‘carrying-out of new combinations’ of all types of resources (Baumol, 1990: 896). Productive entrepreneurship can be replicative or innovative but it is always of value to society.

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8 Baumol’s position with respect to the suitability of analytical methods for the study of entrepreneurship is best understood by reading together his 2010 book (Baumol, 2010) and his 1968 and 1993a papers. Importantly, in his 1993a paper and 2010 book, Baumol also noted that optimization models in general may be useful for studying how innovative entrepreneurship is necessary for the enhancement of profits, which, in turn, constitute a stimulus for replicative entrepreneurs to enter and compete away the innovator’s rents.
Unproductive entrepreneurship, however, refers to activities focused on developing new forms of rent seeking. It is of questionable value to society since it produces merely a welfare transfer. Finally, destructive entrepreneurship refers to activities that produce only a welfare transfer and that, in doing so, result also in a net reduction of social well-being. Warfare and slavery are two such examples. Thus, the important and distinctive feature of all productive entrepreneurship is its value creation potential and its ability to contribute positively to well-being. Productive innovative entrepreneurship, in addition, pushes this contribution further by generating productivity improvements. These improvements contribute to outward shifts of the production possibility frontier of a country and, ultimately, generate economic growth. Consistent with a long-standing tradition in economics, Baumol defines entrepreneurship broadly and reasons that entrepreneurship is a universal characteristic of human nature. He notes that what differs across countries is not the quantity of entrepreneurial orientation across the population, but the way this orientation is expressed.9

Extensive empirical evidence across countries supports Baumol’s view. For example, albeit merely descriptive, the analysis of a large sample of GEM data shows, among other things, a significantly wider discrepancy between aggregate nascent entrepreneurship rates than between average individual-level entrepreneurial propensity (Singer, Amoros, and Moska, 2015). As Sobel (2008) points out, Baumol’s theory stems from the idea that individuals respond to a variety of incentives and that entrepreneurs exploit not only profit opportunities in private markets, but also rents within political and legal arenas. As a result, differences in aggregate rates of entrepreneurship across countries are largely due to the different incentive structures created by prevailing economic and political institutions, whether formal or informal. Among those institutions, a significant amount of research in management and entrepreneurship has shown property rights to be of particular importance (for example, see Acs and Audretsch, 2005, and Foss and Foss, 2005, among many). Given his extensive work on patents and property right systems, I asked Baumol to describe his view on this point.

M: In your famous 1990 paper, you argued that institutions are important because they may encourage or deter productive entrepreneurship which, in turn, drives economic growth. During your career, you have written extensively on the patent system. Is the latter such an institution? Is it important?

B: Well, right now I am working on a book on the patent system because there are now many complaints, especially in the United States, about how slow it is, how uninformative it is, et cetera, et cetera. I have a coauthor, and our basic position is that in any really efficient organization (that is, any field of operation or study), you need a partnership between government and the market. In places where you have had government alone, you end up as in [WW II] Germany, in communist China, et cetera, et cetera, whereas if you have no government intervention, you get the monopolist taking over, you get all sorts of impediments to free exchange, accurate information, and the like. Now there are many problems with patent systems throughout the world and the United States in particular. For example, if you file for a patent today, before you get a decision, it is likely to take two years or three years, and the value of the invention is going down all the time because others are getting similar ideas, et cetera. There are other great problems with the patent system as it is run today. For example, there is no incentive for everyone who applies for a patent; you must write a description of the technology, of the manner in which it works, et cetera, but there is no incentive for writing it clearly, for writing it so others can use it. And the result is that if I want to take an invention of yours and pay you for its use, I have to do it without knowing what it is exactly that your invention does. First of all, I may not even recognize that your invention is the right one for me and, second, it loses an opportunity for society to get full usage of the new idea.

M: Wouldn’t people be concerned about providing accurate and complete descriptions of their ideas fearing they would be stolen more easily?

B: Yes. But there is the opposite problem, too. And that is, suppose I run a company that is very good at inventing, but we are not manufacturers, and you are a very efficient manufacturer, and I come to you and say ‘I have a wonderful invention. It’s just right for you to start a subdivision.’ And you say ‘Give me the description please, I can’t make a contract without a description.’ If that description is not covered by the

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9. Within this context, Baumol’s broad view of entrepreneurship is close to much of the Austrian theory, where entrepreneurship is viewed as a universal feature of human action influenced by contextual incentives, and to the public choice approach to interactions between individuals and political systems. For a review on this topic, see Koppl and Minniti (2010).
innovativeness, Baumol answers clarify his view that productive entrepreneurship can emerge only when the economic system allows the inventor, the manufacturer, and the entrepreneur to coexist and their incentives to be aligned. In countries characterized by well-defined rules of laws and effective limits on a government’s ability to capture entrepreneurial rents (through taxation and regulation), individuals are more likely to engage in productive entrepreneurship. In countries without those institutional characteristics, the same individuals will still be creative, but, in order to extract entrepreneurial rents, they will attempt to manipulate the political or legal process. That is, individuals will undertake costly activities that do not create wealth but, at best, redistribute it, such as lobbying and lawsuits, and possibly destroy it, such as crime.

As Sobel (2008) noted, to appreciate Baumol’s contribution to entrepreneurship theory requires understanding opportunity costs and the difference between positive, zero, and negative-sum economic activities. Activities yield positive sum gains when net wealth is created, such as when innovative entrepreneurs increase consumers’ choice by introducing a new product of superior quality. Instead, government actions that transfer wealth by subsidizing or protecting an industry from competition yield zero sum gains since wealth is redistributed but no net wealth is created. Importantly, when obtaining a transfer requires the investment of resources into lobbying, then the overall impact on the economy is a negative sum, since wealth is not only not created but is, instead, reduced by the allocation of resources to unproductive uses. Unproductive entrepreneurship is unproductive precisely because in the process of capturing zero-sum transfers, it allocates resources that could have been allocated to an alternative productive use. I asked Baumol to comment on some of his work that specifically addresses this point.

M: In your 2002 book, you argue that twelfth century China is a very good example of how institutions may go wrong. What happened?

B: The answer, as far as I know, and I have gotten this from a Chinese correspondent, is that inventors were literally afraid that people would take notice of their invention because if the emperor found that you had a better way of making porcelain, he would forbid you from selling it to anyone but the royal court. He would wait, more than that, he would take all the workers in your workshop, make them work at the royal workshops for slave wages and slave commission. So there is an example of government without markets. There was no market for invention, but

M: Is the U.S. system better or worse than other countries’ systems? Is there a flight of patents to any particular country?

B: The answer is, all of them have problems. See, from the very beginning, patents were run by governments and often in bizarre ways. In England, in the eighteenth century, you had to go to seven different government agencies, each had to approve it, the king had to sign the patent twice—it was unbelievable—and the charge was higher than average per capita income. So, it was no wonder that English inventiveness slowed down. I mean, I’m not saying that’s the full story, but [it] surely must have played some role.

M: In several of your writings, patents and property rights are often identified as important drivers of innovation. What else do you think is important?

B: Well, I’m thinking more of the preparatory institutions: [the] education of innovative entrepreneurs. And the point is, nobody knows how to carry it out. Furthermore, there is very little work being done to find it out. That is to say, we are teaching it to prospective, innovative entrepreneurs doing exactly what our teachers taught them. It’s like medicine in the eighteenth century when they used leeches because others had used leeches. And there is very little testing. Just now there is work beginning in this area, but very little systematic testing of how you teach innovative entrepreneurship. You know, Jean Baptiste Say in 1803 pointed out that to have effective technological change, you need three people: the inventor, the manufacturer, and the person who connects the two—the entrepreneur. And we have business schools all over the country, and they teach very good courses that are good primarily for entrepreneurs who are going to do what others have done before them. And that’s important, too. I’m not suggesting that we give up the one, but we also need the other, and the problem is, I don’t know yet how to do it.

While stressing again the distinctive importance of innovativeness, Baumol answers clarify his view that
plenty of government intervention. And that's my hypothesis. I mean, I have one example, but there is no reason to think that that example is extraordinary. We do know what powers the emperors had. We do know that they loved toys. I mean, you know when the Italian Catholics came over and brought clocks to the emperor, the emperor only wanted the clocks with dolls, dancing dolls. He didn’t care at all about whether it gave accurate time or inaccurate time. And one thing you clearly learn is that government without some sort of market countervailing power can sometimes do good, but is so dangerous. From the example of Stalin, of Hitler, whatever, down to the twelfth century in China, where you were all the property of the emperor, and if the emperor liked your invention, you were in terrible trouble.

M: How was the twelfth century in China different from the Italian states during the Renaissance? Both were military states with not much democracy, but in Italy we saw a lot of creativity and inventions. Perhaps the fact that many small states competed with each other was important?

B: Yes, and aside from the Pope, the governments—the Medici governments—did not last. They really did not control individual activities.

M: Were entrepreneurs seen with a more benevolent eye?

B: I believe that is true…But you see, that’s for research. What I would like to see people do is to get some of the documents of the thirteenth century, fourteenth century, the rise of the house of Medici and see what was going on in invention, see what happened to a new idea once it appeared.

As evidenced from his references to specific historical contexts, Baumol’s theory has significant policy implications. Specifically, it implies that entrepreneurship is truly a bottom-up phenomenon and that governments do not have the informational advantage necessary to pick winners. Rather than focusing on expanding narrowly targeted government programs, such as subsidized loans for special types of businesses or industries, the only effective way to encourage productive entrepreneurship is through institutional reforms that are compatible with individual-level incentives (Minniti, 2008). Institutions providing secure property rights, certainty of the law, effective recourse against contract infringement, and reliable limits to the exploitation of rents from the public sector offer lower returns for rent-seeking behavior and higher returns to productive entrepreneurship. In countries without good institutions, instead, the return to rent seeking is higher, and individuals attempt to capture transfers of existing wealth through unproductive entrepreneurship. Prior to Baumol’s theory, researchers focused only on the relationship between entrepreneurial inputs and entrepreneurial outcomes, without considering the role that the rules of the game played in the entrepreneurial process. In an alternative, Baumol’s theory helps to explain which contexts are more conducive to entrepreneurship and why several top-down interventions have shown little success in actually promoting entrepreneurship.10

Sobel (2008) provided a robust test of Baumol’s theory and found that the data support his predictions. Specifically, Sobel (2008) finds institutional quality to be highly correlated with the measures and proxies for the aggregate quantity of productive and unproductive entrepreneurship. An important implication of Baumol’s argument—and a crucial one for entrepreneurship research—is that while institutions are an important cause of economic change and progress, entrepreneurship is the mechanism that allows economic change to take place (Boettke and Coyne, 2003; Sobel, 2008). The intuition behind this argument is that since entrepreneurs are present in all settings, it is different institutional structures that generate the large variances in standards of living across countries. In summary, Baumol’s (1990) theory puts the innovative entrepreneur who engages in productive entrepreneurship at the core of the economic process and, therefore, positions him/her as the main engine of economic growth.

INNOVATIVE ENTREPRENEURSHIP AND ECONOMIC GROWTH

Citing extensive evidence from Maddison (1982, 2001) and Summers and Heston (1984); Baumol (1986, 2004c) identifies four common patterns that have characterized the history of developed countries since the Industrial Revolution. These patterns consist of a remarkable growth in productivity, the convergence of productivity levels, the similarity and predictability of economic growth rates, and the simultaneous failure of many developing countries to catch up and converge with the industrialized ones. It is in this context that Baumol makes yet another pivotal contribution by focusing on the analysis of comparative economic systems and the role

10Boettke (2001) and Boettke and Coyne (2003) provide policy-oriented extensions of Baumol’s theory.
entrepreneurship plays in the elimination of poverty and in fostering economic growth.\footnote{For some examples of Baumol’s writings on economic growth, see, among others, Baumol (2003, 2002, 2002a, 1986) and Baumol, Litan, and Schramm (2007). A version of Baumol (2002a) was also used as the acceptance lecture for the 2003 FSF-NUTEK Prize held at the Stockholm School of Economics in May 2003.} I asked Baumol to comment on the value of comparative analysis and what scholars can learn from it.

M: You have written extensively on macroeconomic phenomena such as capitalism, the free market innovation machine, and poverty. Does entrepreneurship really reduce poverty? Do you think researchers should appreciate more the lessons history teaches us?\footnote{In his writings, Baumol has used history extensively, both through the use of long-term longitudinal data and through comparative cases. For some specific examples, see Baumol (2002, 2004b), Baumol \textit{et al.} (2007) and the edited volume by Landes, Mokyr, and Baumol (2010).}

B: The answer is, I couldn’t agree with you more. I think history is the only way we are going to get evidence on the subject because it’s very hard to experiment with people. You don’t really want to do that. But you can compare China in the twelfth and thirteenth centuries with China today. And, in fact, I’ve written or coauthored a paper on the subject because in the earlier period, you had this enormous outpouring of invention that seems never to have helped the economy, whereas the twenty-first century China is not a great inventor at all, but has entrepreneurs who copy ideas from other places and is growing at a rate which China has not experienced before. It is my hypothesis that you need them both. That is, that you need the people who create the ideas, who are not entrepreneurs (in general, they can be sometimes), and entrepreneurs who recognize the importance of the idea, who notice that it isn’t quite ready to be used, who see what modifications have to be made to market them effectively, and then you need the people who then turn this into practice. So, in all of this, see, the entrepreneurs play an important part and, to me, who believes with George Bernard Shaw that poverty is the world’s most critical problem, you need both innovative and replicative entrepreneurs.\footnote{Here Baumol is referring to Shaw’s famous quote ‘The greatest of our evils and the worst of our crimes is poverty.’} You need the replicative entrepreneurs today, during the recession, not coming through with speculative ideas that will take 10 years to develop, but a better way to manufacture what we’re already getting, and giving jobs to immigrants, giving jobs to people whose parents were not educated, as we used to do at the end of the nineteenth, beginning of the twentieth century. Whereas today, we try to keep all the immigrants out without thinking how much we are denying them and denying ourselves.

M: Most economists suggest that immigrants play an important role in a country’s wealth and productivity. You seem to agree with that.

B: Well, you look at the people who live in this building, all of whom are very comfortable, and I’ll say nine out of 10 had parents who were immigrants, came here, opened up businesses, learned a trade. My parents, my wife’s parents, I and you need them. They need the opportunity, and we need them. So we are certainly on complete agreement on that—as I expected.

In Baumol’s view, the key to explaining the patterns that have characterized the history of industrialized countries in the last 250 years is, again, the distinction between innovative and replicative entrepreneurship. Throughout his career, Baumol has remained passionate about the innovative productive entrepreneur because of his belief that the entrepreneur alone can ignite the process conducive to the elimination of poverty. Baumol (2002b) argues that throughout history, innovative entrepreneurship has been a key feature of free markets and industrialized economies. In contrast, he continues, imitative entrepreneurship has been a more widespread phenomenon, widely observed in industrialized economies, but also in transition, emerging, and even some centrally planned economies.

For example, Baumol (2002b) discusses extensively the mechanisms that explain why and how capitalism has produced economic growth and living standards unparalleled by any other economic system in history. Most often, arguments used to explain this observation rest on the idea that competition, by pushing prices down, forces firms to be efficient, thereby yielding the most productive use of resources and the highest benefits to consumers. In an alternative, and while still giving price competition its due credit, Baumol focuses on innovation and firm dynamics as the basic engine behind both growth and competition. In his view, and regardless of structure, industries are highly dynamic environments where firms face a continuous arms race not to fall behind (Baumol, Panzar, and Willig, 1982). This pressure encourages continuous innovation and, as a result, increases productivity and pushes outward the economy’s production possibility frontier (Baumol
The linkage between innovative and replicative entrepreneurship and the economic growth characteristics of Baumol’s view of the economic process now becomes clear: as important as the actual process of invention is, the activity of those who translate the inventions into practical and commercializable new products and services is the real lubricant of economic activity (Audretsch and Keilbach, 2007). In Baumol’s logic, the inventor and the innovative entrepreneur are both necessary for economic growth to take place, and without either one of them, the process cannot unfold. Still, a fundamental role also exists for the imitative entrepreneur who is responsible for the massive expansion of markets and for the creation of competitive pressures that push innovative entrepreneurs toward further innovations.

In the last few decades, and in spite of massive technological innovations, the growth rates and per capita GDP of several developing and emerging economies have converged toward those of historical economic leaders. This suggests that in the former group of countries, a sufficiently large number of entrepreneurs have specialized in adopting and replicating the leaders’ innovations. In other words, replicative entrepreneurs are spearheading the growth process of those countries.

Baumol (2004c, 2002b) also argues that this convergence phenomenon has been stimulated by the coexistence of several other circumstances: (1) the reduction of cross-country impediments to the free exchange of scientific and technical information; (2) the increasing reliance of countries’ economies on international trade and, therefore, their need to avoid lagging technologically behind their foreign competitors; (3) the exponential growth in the number of people engaged in information-related activities, which has put an unprecedented number of individuals in the position to diffuse information; (4) the improvement of communication techniques, which has greatly reduced the lags involved in the dissemination of relevant knowledge. Taken together, these factors have allowed replicative entrepreneurs to succeed in large numbers and contribute to growth in an unprecedented way.

If replicative entrepreneurship is the key to the convergence of living standards observed across industrialized and many developing countries, then it is reasonable to conjecture that other countries’ failure to converge may be attributed, at least in part, to their lack of a sufficient number of replicative entrepreneurs. This argument is consistent with Baumol (1990)’s theory of productive and unproductive entrepreneurship. Lacking any specific non-contextual reasons why the total supply of entrepreneurs should be lower in some countries than in others, a country’s failure to produce a sufficient quantity of productive entrepreneurship, whether innovative or replicative, suggests the presence of cultural or political impediments to its exercise. Thus, once again, important policy implications emerge from Baumol’s work (Audretsch, Baumol, and Burke, 2001).

First, replicative entrepreneurship is less sensitive than innovative entrepreneurship to the economic and political constraints characterizing a country. This explains why, as long as replicative entrepreneurship is present, even some nonmarket economies have benefited from innovation initially developed in market economies. It is also consistent with Mulligan, Gil, and Sala-i-Martin (2004), who found little difference in economic policy between democracies and non-democracies. Second, the encouragement and support of a critical mass of replicative entrepreneurship may be a sufficient condition to enable a developing country’s convergence on the living standards of industrialized economies. This is consistent with Minniti and Levesque (2010), who developed a model of economic growth in which, given prohibitive R&D costs, convergence can be driven by replicative entrepreneurship. Third, the development of institutional arrangements that preserve incentives to innovation emerges as one of the main goals of economic policy—not only domestically, but from the viewpoint of world economic welfare as well.

In sum, the focus of Baumol’s vision of the economic system centers on the strategic behavior of innovative productive entrepreneurs. Because of the costs of R&D and the risk of obsolescence, firms do not necessarily wish to innovate. Nevertheless, the pressure to remain competitive forces them to do so,

14 In this journal, Baumol and Strom (2008: 233) wrote: ‘Since Adam Smith’s articulation of the invisible hand, these scholars have contended that the market mechanism grew by itself, that it runs by itself, and that there is no one who operates or controls it. A close look at the extraordinary economic growth of the last two centuries, however, suggests that the market mechanism does not do its work without the input of individual actors. In fact, we can identify a group of people who play an indispensable role for operation of the market mechanism and for driving these unparalleled levels of growth: the entrepreneurs who bring cutting-edge innovations to market.’
not only with respect to products, but also with respect to how their innovation is used and disseminated (Baumol, 2004a). Thus, in Baumol’s analysis of capitalism, the strategic actions of innovative productive entrepreneurs and the industry dynamics they produce are at the core of economic growth because they generate a huge surplus for the economy as a whole.

CONTESTABLE MARKETS AND THE COST DISEASE

The historical evidence on the market’s accomplishments emphasizes its dynamic nature and its ability to stimulate a flow of new products and processes. This explains the unprecedented growth in productivity and per capita GDP experienced since the Industrial Revolution. Within this context, Baumol’s view of the economy considers the innovative productive entrepreneur as the key agent of change and origin of growth in the economy. Still, the mechanism through which the actions of this agent influence industrial dynamics and the economy needs to be clarified. The goal of this part of the paper is precisely to close the loop by highlighting two of Baumol’s main contributions to our understanding of industry dynamics. Once again, both contributions emphasize, whether implicitly or explicitly, the role of the entrepreneur.

Sustained growth requires the rapid dissemination of technological advances so that all firms can make use of the new products and processes. The standard depiction of the innovating firm is often that of an organization that uses patents, trade secrets, and other available means to prevent other firms from using its ideas. And yet, the reality of industrial strategy and relations paints a different picture. Innovations are rarely developed in isolation or kept secret for a long time. While the pressure to innovate forces firms to strive to stay ahead, it also creates incentives for that knowledge to be shared so that all firms benefit from a larger pool of R&D investment (Baumol 2000, 1993b). In his 2001 interview with Alan Krueger, for example, Baumol refers explicitly to IBM and Toshiba sharing practices and the extent to which they would go to remain involved with each other’s portfolios of innovations (and those of the other competitors). Dissatisfied with static depictions of industrial dynamic, Baumol tackles the analysis of innovation and its resulting strategic implications at the industry and entry levels in his theory of contestable markets (Baumol, 1982; Baumol et al., 1982; Baumol, Panzar, and Willig, 1983).

While well known in economics, the theory of contestable markets is not yet well known in the entrepreneurship and management literature. According to Baumol, a contestable market is a market that, although characterized by the presence of a small number of established firms, is also characterized by a high degree of competition due to the presence and churning of many potential short-term entrants. In other words, the basic idea is that certain features of the market allow new entrants to ‘contest’ the incumbents’ dominance.

A perfectly contestable market has three main features. Namely, it has no entry or exit barriers, no sunk costs, and all firms (new and incumbent) have access to the same level of technology. The absence of sunk costs is important because if new entrants cannot reuse or transfer resources, exit barriers are present, and firms will not enter the market. Access to the same level of technology, instead, is relevant since it is an important determinant of production costs. New firms with insufficient knowledge or technology will face higher average costs and be unable to compete.

While very few markets may be perfectly contestable, many markets are highly contestable, especially those in which smaller and newer firms are more likely to enter. For example, traditionally considered one of the most concentrated in the economy, even the U.S. steel industry turned out to be a contestable market thanks to the emergence of small steel mills in the 1970s and 1980s. Similarly, deregulation and the emergence of low cost carriers rendered the airline industry a highly contestable market, at least for a period of time. From the point of view of the economy as a whole, contestable markets are important because they allow for outcomes that, in spite of significant market concentration, yield outcomes that are similar to those delivered by competition. Competition, however, is not taken as a given and inescapable feature of the market. Instead, it emerges organically and endogenously from the strategic decisions of firms.15

Contestable markets are characterized by what Baumol et al. (1982) call ‘hit and run’ competition. If a firm in a contestable market raises its prices well above the average price level of the market and, thus, begins to earn above economics profits, potential rivals will enter that market. When the original incumbent firms respond by lowering prices to levels

15 For related arguments, see also Arora, Fosfuri, and Gambardella (2002) and Lamoreaux and Sokoloff (1996).
consistent with normal profits, the new firms will exit. Thus, an important implication of the theory of contestable markets is that industry structure is explained endogenously by the strategic decisions of firms rather than accepted as existing exogenously. Baumol’s contribution goes beyond standard industrial organization and shows that pricing and production decisions are not actually dependent solely on market structure, but on the threat of competition (Baumol, 2000).

The competitive dynamic described in the theory of contestable markets has important implications for our understanding of strategic behavior (which remains largely unexplored). In particular, Baumol’s logic allows us to better understand the double-edge strategic pressure that innovative entrepreneurs face in contestable markets where they are caught between strong incumbents and potentially short-lived entrepreneurial rents. The theory of contestable markets has significant implications also for the development of appropriate antitrust laws and, in general, for the analysis of what property rights and regulatory structure may be more conducive to innovation.

In addition to the theory of contestable markets, Baumol’s work on industrial organization and the theory of the firm spans contributions on the use of rules of thumb (Baumol and Quandt, 1964), the behavioral theory of the firm (Baumol and Stewart, 1971), and the analysis of the performing arts industry (Baumol and Bowen, 1966), to cite just a few. Baumol’s work on the economics of the arts is particularly important and at the origin of his theory of productivity differentials across sectors. Normally referred to as ‘Baumol’s cost disease,’ the theory of productivity differentials also has implications for strategic entrepreneurship.

The intuition behind the cost disease is that some industries, such as many sectors in manufacturing, have a potential for sustained long-term productivity growth, while other industries, such as the performing arts, cannot increase productivity significantly, even in the long run (Baumol and Bowen, 1966). This asymmetry implies that in industries whose productivity cannot increase, output prices will increase indefinitely compared to prices in industries where productivity grows. This explains why, for example, the price of surgical procedures keep rising while the price of automobiles does not. In turn, this means that the demand for the output in relatively low productivity industries will either decrease over time or become an increasingly larger share of consumers’ total expenditures. The nature of the output (whether it be theater performances or surgical procedures) and the elasticity of its demand will determine which scenario will emerge.

Baumol’s cost disease is important because it reconciles the neoclassical economics view that wages are closely tied to labor productivity changes with the real-world observation that this is not the case in many labor intensive sectors, especially those characterized by complex productive structures where labor is combined with a web of complementary factors. The ramifications of the cost disease are evident everywhere in the economy, from health care to education to elder care and the arts. Baumol’s theory of productivity differentials has significant implications for strategic entrepreneurship because innovative entrepreneurs tend to be disproportionately located precisely in those knowledge- and labor-intensive sectors that are more susceptible to the cost disease. Thus, while still relatively unknown among entrepreneurship scholars, Baumol’s insight on the implications of productivity constraints provides a useful model for the study of entry, survival rates, profitability, performance, coopetition, and other strategic entrepreneurship issues.

Importantly, although the theory of contestable markets and the cost disease argument both focus on strategic issues related to the market, they still put the entrepreneur at the center of the economic process. For example, the threat of entry in contestable markets forces incumbents to continue innovating and behave entrepreneurially. In a different scenario, the lack of entry due to, say, regulatory behavior or other impediments that cannot be overcome by innovation and enterprise, results in the cost disease.

INVENTING THE ANALYSIS OF INVENTION

Baumol’s focus on innovation, his theory of productive entrepreneurship, and his work on contestable markets are just a few of the many

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16 Importantly, Baumol’s cost disease is consistent with the observation that even in some sectors where labor is combined with a web of complementary factors, wages may decline for a subset of workers. This is due to the combined effect of excess entry together with low elasticity of demand toward a portion of the participating workers generated by reputational effects that increase the marginal product of those workers. In other words, it is possible to have an Oscar-winning actor receive a $50 million engagement contract in spite of there being thousands of underemployed actors.
controlled experiment

B: Did entrepreneurs who need not do what our teachers trying does a better job than what our teachers did time that we started to experiment to find out taught with great care to do what was done yesterday craftspeople maybe a little bit better in Japan tend to destroy both of them said that the way universities are now operated economics courses, see Phipps, Strom, and Baumol (2012).

M: Do you really think we can learn by working directly with students?

B: Well, I would urge you to think of it as an almost controlled experiment. I mean for their benefit and recording of what you have learned from what works and what does not work as well in the process. It's that opportunity to turn medicine from taking leeches into testing new pharmaceuticals. It is only from experiences such as yours and historical analysis. Those, as far as I can see, are the only two ways that are available to us to find out how to stimulate and prepare innovative entrepreneurs...And maybe there is no way to teach, except to bring a bunch of students together and say 'I will give a prize for the best idea in this group. You can help each other, you can keep it from one another. Just see what your imagination can produce.'

M: Are you suggesting that courses focusing specifically on innovative entrepreneurship are important?

B: We can study in your courses and mine when you have a group of 20 students if it's a course in innovative entrepreneurship, not replicative entrepreneurship. And I don't classify one as better than the other, but they are different. In the replicative entrepreneurship, we know what to teach. We do a good job at teaching them. We teach them bookkeeping. We teach them how to deal with tax laws. We teach them all sorts of things that they need, and we need them during a recession, we need when immigrants come into a country who go out and start new shoe shops, and new stationary stores, whatever. They need to know what laws apply, and they need to know how to keep records, and we know how to teach that. And the business schools do a good job of that. So it's not unimportant, and we have information. But the really critical thing for the long run, if we are going to continue to fight poverty in the world, is productivity enhancing inventions. And not only inventing, but making sure that it is used efficiently.

M: Do you think this is an area that needs to be investigated more carefully than done so far?

B: Oh, I think as you know, it's an important field, and it's one in which especially on the innovative entrepreneur side, standard methods don't work. By definition, you can't add up two inventions to a third invention and get a total, you know. By definition, it's easy to find out what happens to cost when you produce two dozen apples instead of one dozen apples because there is homogeneity. But, by definition, if it's homogeneous, it isn't an invention. That is, if two products can be added, they are merely replications of the other. So the standard method doesn't work because it is the ultimate field in which heterogeneity predominates. Every unit of every commodity

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[17] For more discussion on the relationship between education and innovation, see Baumol et al. (2009). For a discussion focusing on the explicit introduction of the entrepreneur in principles of economics courses, see Phipps, Strom, and Baumol (2012).
produced has to be different from every other, so you can’t add them, you can’t subtract them, you can’t use the letter n to represent the number because the number doesn’t mean anything. So that is why we are driven back to history. You see, we can conduct experiments very well, we can in teaching, and there I do argue that we’re not doing enough, but in analyzing the work of the entrepreneur, there’s a limit to what rigorous analysis can do. That does not mean no analysis; imagination and the analysis is also possible, but you can never really construct a model in which ‘n’ is the number of inventions and ‘h’ is the number of hours the inventor worked on them. It makes no sense because by very definition, the product, the process has to be heterogeneous. So, in a sense, I think it’s an opportunity.

Entrepreneurs are made, not born. Baumol argues this is true for innovative entrepreneurs as well. Although much recent research has addressed issues related to entrepreneurial cognition and creativity, Baumol’s work invites us to explore and leverage the lesson of history, and he stresses the importance of pushing our investigations across disciplinary boundaries. Eliasson and Henrekson (2004: 1) appropriately have written that: ‘Although basically neoclassical, Baumol’s ambition has been to extend mainstream economics to be compatible with a wider range of theoretical assumptions and economic phenomena than the received model is capable of addressing in a relevant way. In doing so, Baumol has constantly built new bridges that link theory, policy, and practice. In many ways, Baumol can be seen as a revolutionary from within in that he masters the tools of the trade and insists that they be used, as far as possible, to address real-life problems of great urgency.’

CONCLUSIVE REMARKS

In sum, William Baumol is well known for the quality and theoretical rigor of his work. He is also known for having always focused on important, real questions. Among other things, Baumol has written on the cost of health care and education (Baumol, 1993c), the development of a proper set of patent laws and property rights (Baumol and Ordover, 1988), the support and distribution of the arts (Baumol and Bowen, 1966), the political economy of procurements (Baumol, 1947), and the importance of R&D expenditures (Braunstein, Baumol, and Mansfield, 1980). His strong ethics have always compelled him to make sure the practical implications of his research were well fleshed out. Even in the brief thank you message he recorded for receiving the 2014 Entrepreneurship Division Foundational Paper Award from the Academy of Management, William Baumol reminded us that what we do matters and that there is nothing intrinsically virtuous about innovation: it is what people innovate and how the innovation is used that matters. Toward the end of our conversation I asked:

M: Innovation is so important, but how do we know what is more conducive to innovativeness?
B: The answer is, you don’t know and neither do I. I mean, it’s a field that is ready for us to invade. We have to invent the analysis of invention.
M: This seems like a very difficult problem that you plan on continue working on and worrying about in the future…
B: Yes, yes. So that’s one of the hard parts that you and I have to worry about. Yes. And enjoy worrying about.
M: I guess one of the great advantages of our profession is being able to ask important questions that we really care about.
B: Exactly right!

On October 1, 2014, the Stern School of Business and the College of Arts and Sciences at New York University gathered to celebrate William J. Baumol on the occasion of his retirement. Now well into his 90s, Will remains an active researcher. He continues to enjoy worrying about important questions he really cares about.

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