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Question 1:

The Harrod-Domar and other classical growth models all share similarities that preclude them from having a place for the entrepreneur. When economic growth essentially depends on savings, capital investment, and the supply of labor to firms, the concept of an entrepreneur is separated from classical economic theory. It is only by focusing on endogenous human capital as an engine of economic growth that economic theory can begin to explain exactly from where the addition of exogenous technology to the economic system comes.

The creation of models based on endogenous growth opened the door for entrepreneurship and added to the question of convergence theory in several important ways. The classical growth models such as the Solow and Harrod-Domar models addressed the existence of firms but did not include the essential entrepreneur that represents the firm. These models tended to be based on the firm and the industry rather than the individual; perfect competition, static equilibrium, and perfect information about the markets and processes of production necessitated that individuals be homogenized. As economic growth theory evolved, the necessity of individuals who are specialized in entrepreneurship gained recognition¹. The presence of entrepreneurship was needed in the endogenous growth models, which stated that economic growth did not come from some exogenous factors but from actors within the

¹ Vera Catarina Rocha, "The Entrepreneur in Economic Theory: From an Invisible Man Toward a New Research Field", *FEP Working Papers N. 459*, 2012, 2-3.

economy. As inventors created inventions, entrepreneurs created innovations, and it was this innovation that explained the way in which the economy grows.

What Rocha tells us is that competitive market theory is based on exogenous assumptions that provide for the opportunity to avoid explaining entrepreneurship. In endogenous growth theory, certain functions – discovering new ways to combine knowledge, promoting other individuals' inventions, exploiting opportunities on a subjectively evaluated basis – can only be fulfilled by the existence of an entrepreneur or at least an entrepreneurial function performed by an individual. The discovery of knowledge cannot be explained by firms' actions, because in the end knowledge is always discovered through some cognitive process. In the endogenous growth models, the entrepreneur often bears risk in order to achieve market equilibrium².

As Wennekers and Thurik iterate, classical economic growth theory concentrated mostly on economic expansion as the result of labor and capital. In all of neo-classical economics, endogenous growth theory is demonstrably the most effective in providing a place for the entrepreneur. Solow's 1970 theory involving long-run tendencies as well as the theory of growth accounting propounded by Denison does not have a place for the entrepreneur; perfect competition, as Wennekers and Thurik explain, implies that any individuals with entrepreneurial potential would not have an opportunity for profit. A general perfect equilibrium is incompatible with the concept of innovation, and growth accounting does not explain from where capital comes³.

² Rocha, 2-3.

³ Sander Wennekers and Roy Thurik, "Linking Entrepreneurship And Economic Growth", *Small Business Economics* 13, no. 1 (1999): 35.

Romer's endogenous growth theory shows economic growth as the result of research and innovation. The entrepreneurial function has a place in transforming blueprints into economically viable products. Distinguishing itself by emphasizing growth as inherent to the economic system, Romer's theory studies research and development as well as productivity by looking at individuals. While some say growth comes from technological change, endogenous models such as Romer's suggest that the aggregate rate of knowledge discovery, regardless of such discovery's circumstances and intentions, is endogenous. This is because the rate of discovery is determined by what individuals do. Since individuals perform this function, best described as entrepreneurial, growth is almost purely endogenous⁴. The additional advent of spillover models has also made its contribution; knowledge and technology spillovers are best explained by the actions of the individual entrepreneur.

Growth being endogenous to economies, the lack of convergence of income rates in the short-run is more explainable. Entrepreneurship, as opposed to its marginal role in earlier centuries, gains greater relevance⁵. By propounding theories where the formation and conversion of knowledge into capital is needed for growth, economists such as Romer and Lucas expanded on the role of industrial innovation. The assumption of lack of increasing returns to scale and the rigidity of classical growth models precluded this role⁶.

Knowledge spillovers require a channel through which to occur. As Rocha says, they do not happen automatically; knowledge must be converted into a relevant and viable format by the

⁴ Paul M. Romer, "The Origins of Endogenous Growth", *Journal of Economic Perspectives* 8, no. 1 (1994): 13.

⁵ Rocha, 3.

⁶ Ibid., 17.

subjective observations of the entrepreneur. This phenomenon in theory gives products quality and creates growth within an economy⁷.

It is the idea that traditional factors such as labor and capital are insufficiently explanatory and that knowledge plays a vital role that truly opened the door for the entrepreneur in economic theory. Research and development, human capital, and invention all give the entrepreneur vitality in these theories⁸.

The appropriation of exogenous knowledge in a process known as innovation creates firms in the endogenous growth model. The necessity for the commercialization, or transformation, of exogenous knowledge into economically viable output is what gives the individual entrepreneur a place in economic theory⁹. While competitive market theory assumes perfectly competitive markets, endogenous growth theory acknowledges that markets derive the extent of such competition from the entry and exit of new firms and thus from the quantity of entrepreneurship. By finding different means of utilizing available existing knowledge, entrepreneurs increase firm diversity and thereby increase competition¹⁰.

⁷ Ibid., 17-28.

⁸ David Audretsch and Roy Thurik, "A Model Of The Entrepreneurial Economy", *International Journal Of Entrepreneurship Education* 2, no. 2 (2004): 144.

⁹ "A Model of the Entrepreneurial Economy", 151.

¹⁰ "A Model of the Entrepreneurial Economy", 152.

Question 2:

Focusing on the entrepreneurial function, the Acs, Audretsch, et. al theory of entrepreneurship describes knowledge spillovers. In contrast, Baumol examines the way in which the entrepreneur thinks as well as his or her motivations for choosing to engage in entrepreneurial activities of various levels. The Acs et. al theory describes how research and development creates knowledge endogenously. Rather than entrepreneurs' knowledge creation spilling over to other individuals, Acs et. al tend to focus on the entrepreneurial function's ability to identify and exploit knowledge so as to create new firms and drive economic growth¹¹.

Citing Nordhaus' 2004 empirically-based statement that innovators are usually only able to capture approximately 2.2 percent of the surplus generated from innovation, Baumol emphasizes the fact that entrepreneurs typically incur low economic profits. Relating the low or even negative profits of the entrepreneur to those of an individual buying lottery tickets, Baumol emphasizes the notion of psychic compensation for such low economic returns¹². Essentially, Baumol seems to focus on the traits of the entrepreneur, whereas Acs et. al focus less on the individual's characteristics and more on his risk-bearing behavior and decision-making process.

In theory, both articles describe in different ways the notion that existing firms experience numerous market factors and momentum-based incentives that inhibit them from making use of economic opportunities to the extent that certain individuals are capable. Baumol's theory mainly adds to this notion by explaining why individuals behave in entrepreneurial fashion;

¹¹ Zoltan J. Acs et al., "The Knowledge Spillover Theory Of Entrepreneurship", *Center For Economic Policy Research*, 5326 (2005): 1.

¹² William J. Baumol, "Entrepreneurship and Innovation: The (Micro) Theory Of Price And Profit", *Working Paper*, 2007. 18.

essentially, he evaluates the intrinsic psychic rewards as adequate compensations to the extrinsic low economic profits in the mind of the entrepreneur.

The focus of Baumol on the motivations of the entrepreneur contrasts with the focus of Acs et. al on factors promoting and inhibiting entrepreneurship. The knowledge spillover theory influences the latter's concept of information spillovers depending on the quantity of human interaction as well as the former's concept of economic returns to innovation being lost to such spillovers. Baumol explains the psyche of the individual who chooses entrepreneurship instead of gainful employment by attributing his or her behavior to miscalculation or overly optimistic perceptions of his or her economic prospects for reward¹³.

Acs, Audretsch, et. al describe the sources of opportunity for entrepreneurs to exploit, criticizing Schumpeter's early work for its lack of explanation in that regard. They applaud Romer and expand on his question of opportunity's origins by determining that incumbent firms open up opportunities for entrepreneurial exploitation by engaging in research and development. When incumbent firms cannot make full use of the resulting knowledge, we see a spillover effect to other individuals. It is this explanation of economic opportunity in the article that partially distinguishes it from the Baumol article¹⁴.

Such exploitation of opportunity to Acs, Audretsch, et. al mostly depends not on previously common ideas that entrepreneurs are simply less risk-averse and more talented as individuals. Their article illustrates the idea of discovery. Discovery is a creative process, and it

¹³ William J. Baumol, "Entrepreneurship and Innovation: The (Micro) Theory Of Price And Profit", *Working Paper*, 2007. 19.

¹⁴ Zoltan J. Acs et al., "The Knowledge Spillover Theory Of Entrepreneurship", *Center For Economic Policy Research*, 5326 (2005): 3.

depends exclusively on the individual because organizations and incumbent firms are not people. Only entrepreneurial individuals can engage in discovery, and therefore the Acs, Audretsch, et. al paper essentially leaves us with the unique notion that entrepreneurship is based more on individual cognition than anything else. This cognition is a dynamic process, and therefore an individual's propensity to innovate can change over time. Essentially, Acs, Audretsch, et. al tell us that entrepreneurship is based on this factor more-so than it is based on the idea that people are inherently and innately different in their innovative abilities¹⁵. Basically, it depends on the individual's subjective ability to perceive objective opportunities.

Both seem to suggest that opportunities are endogenous rather than exogenous¹⁶. Baumol additionally revolves his article around the notion that incumbent firms and entrepreneurs are engaged in a mutually beneficial relationship. For economic theory, this implies that large firms find it more profitable to delegate more radical innovation to smaller firms and to place their focus on research and development that leads to incremental improvements¹⁷. Innovation in this respect is a weapon; it is used to force firms to engage in research and development in order to merely keep up with the industry standard¹⁸. For both authors, high levels of knowledge contribute extensively to entrepreneurial opportunities in different ways. Investments in new

¹⁵ Zoltan J. Acs et al., "The Knowledge Spillover Theory Of Entrepreneurship", *Center For Economic Policy Research*, 5326 (2005): 4.

¹⁶ Ibid., 11.

¹⁷ William J. Baumol, "Entrepreneurship And Innovation: The (Micro) Theory Of Price And Profit", *Working Paper*, 2007.

¹⁸ Ibid., 29.

knowledge lead to more entrepreneurial activity. Both authors make substantial contributions to occupational choice theory¹⁹.

¹⁹ "The Knowledge Spillover Theory Of Entrepreneurship", 13-14.

Question 3:

One element of Knight's understanding of entrepreneurship that brings light to the characteristics of the entrepreneurial economy is the argument that low uncertainty causes transactions within firms to be more efficient than market transactions. This, as Audretsch and Thurik ascertain, has important implications. In an economy characterized by large quantities of entrepreneurial activity, higher levels of uncertainty make market transactions more efficient than transactions within firms²⁰.

An additional and very basic contribution made by Schumpeter is the recognition that an economic model without the inclusion of entrepreneurship is akin to a performance of Hamlet without the Prince of Denmark²¹. The Baumol article, which describes the market's imposition on firms of the necessity for discriminatory pricing as implicit to Schumpeter's model²², essentially tells us that entrepreneurs are motivated to price discriminate.

Schumpeter taught us that a competitive market is essential to the process of creative destruction. His ideas help us understand entrepreneurship through the lens of serving as an important and primary source of competition and thus economic growth²³. Schumpeter and his work are defined by dynamism, and he defines the entrepreneur as a dynamic character. The occupational choice of the individual, whether it is employment or entrepreneurship, depends on

²⁰ David Audretsch and Roy Thurik, "A Model Of The Entrepreneurial Economy", *International Journal Of Entrepreneurship Education* 2, no. 2 (2004): 157.

²¹ William J. Baumol, "Entrepreneurship And Innovation: The (Micro) Theory Of Price And Profit", *Working Paper*, 2007. 2.

²² *Ibid.*, 2.

²³ Hasan Torun, "Innovation: Is the Engine for the Economic Growth?", *Ege University Working Paper 13-03-1625*, 2007, 8.

culture, economic circumstances, and the extent of knowledge within the economy. As Lucas describes in his article, the entrepreneurial talent or skill within individuals is variable, and its distribution gives the entrepreneurial economy and its firms their dynamic and heterogeneous characteristics.

Schumpeter's assertion that capitalists fund entrepreneurs and that entrepreneurs do not necessarily need to have their own savings contributes to our understanding of occupational choice theory²⁴. Essentially, what Schumpeter contributes to the discussion is that entrepreneurship disrupts economic equilibrium, depends not on savings but on low risk aversion, and that the entrepreneur is a temporary status for the individual. All of these factors distinguish the study of entrepreneurial activity from the study of classical theory. Models of the economy that exclude the necessary existence of the entrepreneur tend to be much more static.

Schumpeter's assertion that entrepreneurship is basically a function performed by an individual gives us a greater understanding of occupational choice theory²⁵. Individuals can differ in their ability to innovate and to act in entrepreneurial ways. An individual's action can be described as entrepreneurial as long as it alters the course of affairs in any situation. Individual differences in the ability to perform the function of entrepreneurship are reflected in the growth and distribution of firms. Schumpeter's statement, by implying that the economy is in need of an individual to perform radical innovation due to the limitations imposed on incumbent firms, demonstrates the psychological aspect of entrepreneurship.

²⁴ John A. Mathews, "An Evolutionary Theory of the Economy as a Whole: Reflections on Schumpeter's Lost Seventh Chapter to the Theory of Economic Development", *MGSM Working Papers 2003-15*, 2002, 5.

²⁵ *Ibid.*, 5.

With an understanding of opportunity cost, we can ascertain that a larger economy with higher wages makes this entrepreneurial function less prevalent in the economy. The Klepper article generally emphasizes that as firms grow larger to take up a greater portion of their industries their profits proportionally increase. In theory, this means that firms evolve in accordance with the sum of their implicit entrepreneurial talent. The differences in entrepreneurial ability are magnified as time continues for each industry.

There are numerous contributions that Knight and Schumpeter make to our understanding of entrepreneurship and the entrepreneurial economy. These contributions set the stage to allow us to understand the factors underlying the entry and exit of firms in any given industry; most firms will exit, save for those with the greatest human capital in terms of entrepreneurship. Dynamism dissipates and the fluctuation of the market ceases to occur to a large degree as economies mature. This notion (the idea that entrepreneurship decreases as all firm sizes increase) is essential to our understanding of the phenomenon of entrepreneurship.

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