A Discourse on A Model of the Entrepreneur-Centered Economy

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I. Introduction

Despite its elegance and beauty, the neoclassical model [see Debreu, 1959] has long been a subject of dissension. Critics of the Model are concerned (for example), with (1) its reticence on the *raison d'etre* of the firm and the boundary between the firm and market, (2) whether this equilibrium model is capable of dealing with the ever changing market and (3) its ability to discern whether econmic development is driven by technological change or by market extension. The standard neoclassical model's inability to deal with these issues can be seen readily by reminding the reader how the market economy is perceived by the neoclassical economist.

The economy is composed of two sets of primitive agents - the consumer and the firm. All agents are assumed to behave non-cooperatively and pursue their own self-interests in a complete and competitive market environment. Given the market prices, the consumer chooses a consumption plan to maximize his utility subject to a budget constraint, and the firm selects a production plan to maximize its profit. Demand and supply interact in the market to determine prices which clear the markets. Guided by prices within and without the firm, resources are allocated solely by the impersonal market. A state of equilibrium will emerge and this equilibrium is Pareto optimal.

This static view of the economy is also valid in a multi-period setting. In such an environment, commodities are distinguished not only by the physical

characteristics but also by the time and state of nature in which the commodities are delivered. Assume all contingent markets exist and are competitive, agents will trade contingent claims (future contracts) to be carried out when a given state of nature has occurred. Under this situation, both the consumer and the firm will want to make commitments now for future delivery of commodities on the contingent basis. Futures markets which open in the current period will take the place of the spot markets which would have opened sequentially. Equilibrium of the economy occurs whenever there exists a set of futures prices under which the consumer's consumption plan maximizes his expected utility subject to his overall budget constraint, the firm's production plan maximizes its present market value, and demand is equal to supply in each and every market. Because agents, in choosing their plans, have access to the complete set of futures prices, sales are all contracted and paid for in the current period on the basis of the equilibrium contingent prices. As time elapses and events unfold, deliveries are made according to the contractual arrangements. No future use of the spot markets is necessary.

From this description of the economy, it is evident that the neoclassical model was never intended to deal with the initially posed issues. First, not only the existence of the firms is assumed, their allocative role is also denied. Because all the activities in the firm and the market are guided by the market prices, "the market works itself" with demand and supply interacting to determine both the employment of inputs and the distribution of products according to the universal marginal principle. The firm does not possess a separate internal decision rule and makes no independent contribution to the market

outcome. The market alone allocates resources and, as such, there exists no boundary between the firm and the market.

Second, the primary concern of neoclassical economics is not the market process *per se* but the existence of an equilibrium. Because resources are owned by individuals and the individuals' endowments and preferences vary widely, the primary mission of the neoclassical economist is to show that the decentralized market is capable of reaching a mutually consistent outcome for all market participants. In other words, there indeed exists an equilibrium. Consequently, enormous amount of energy and talents has been devoted to identify conditions under which an equilibrium will emerge. The issues concerning the market process are pushed to the background. Once the existence of an equilibrium is assured, the only remaining important issues becomes whether the outcome of this equilibrium (or equilibria) represents an efficient and equitable allocation of society's scarce resources.

Finally, in the neoclassical framework, there is no room for endogenous growth. Since the neoclassical model is developed under the premise that endowments of resources, consumer preferences, and production technologies are all given and full market information through prices is available to all participants, the market necessarily would have explored all opportunities and settle on the one which is optimal both for now and in the future. There is no possibility for improvement and change. Should the economy experience any change at all, the change must be brought about by exogenous factors, such as technological improvement or population growth. Because growth takes place only through exogenous shocks, the distinction between growth induced by the

technological push and by market extension (e.g., population expansion) is minimized. Inadvertently, the capitalistic market is robbed of its inherent creativity.

Recognizing the short-comings of the standard neoclassical model, economists in recent years endeavor to improve its realism by relaxing some of its assumptions. Frank Knight [1971] had pointed out long ago that the fundamental difference between perfect and actual competition is that uncertainty is absent in the former but ubiquitous in the latter. The bulk of the contemporary literature reflects the efforts to extend the neoclassical model by incorporating uncertainty. While these efforts have brought marked improvements, because the modelers insist on retaining the neoclassical perception that the market alone is capable of allocating resources, the extended model remains unequipped to cope with the questions that we seek to answer. An alternative model must be found.

Accordingly, we wish to call the reader's attention to a model of the entrepreneur-centered economy that overcomes these shortcomings. This model [Wu and Qin, 1996] reflects the understanding that the presence of uncertainty implies that some contingent markets are absent. With the absence of these markets, resource owners no longer have access to a complete set of contingent prices and, therefore, lack the full market information. Dissimilarity in endowments and preferences among individuals inevitably leads to disagreement on the production policy. This disagreement destroys joint production and, therefore, causes the market to breakdown.

As points out by Frank Knight, chaos in the market place also offers entrepreneurial spirited individuals opportunities to rise and restore production through their own volitions. Entrepreneurs use their own subjective judgments (instead of

objective knowledge) of the market to make production decisions. In this way, entrepreneurs take an active part in resource allocation. The resulting economy is thus called the entrepreneur-centered economy. The perception of this economy is that

> Consumers are the only primitive agents. They own all the resources of which land, labor and capital are tradable in the factor markets while entrepreneur services are not. Each agent holds at least a two-period decision horizon, today and tomorrow. Today is known with certainty and tomorrow is uncertain. In order to sustain consumption in the future, the agent must convert his current resources into future income. He does so by participating in production. The owner of a tradable resource obtains his income by selling his services to the firm. The entrepreneur, on the other hand, does so indirectly. He first helps to organize the firm which converts inputs into a commodity and then claims a share of the firm's profit as income after the commodity is sold in the market. The firm is organized whenever (1) a set of entrepreneurs agree to organize themselves into a particular form and adopt a profit sharing rule, (2) the cooperative entrepreneurs settle on a specific production and financing policy, and (3) the firm acquires the necessary financing.
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> In the entrepreneur-centered economy, the consumer chooses his consumption, investment and production activities so as to maximize his expected utility subject to a set of appropriate constraints. The firm has no objective of its own; it merely serves as a vehicle for the entrepreneurs to carry out their optimizing activities. Activities in this economy include simultaneously the consumption-investment of the consumer, the coalition formation of the

entrepreneurs, the production of the firm, and the exchanges in the market. As these activities interact to bring the economy into a state of equilibrium, the prices of the commodities and the amount of financial securities are determined, the traded and non-traded resources are channeled into their employment, and the number and internal organization of firms are also determined. In this manner, the formation of the firm, the determination of resource utilization and the exchange of goods and services all become an integral part of the allocative process in this economy.

The purpose of this paper is two fold: First, we briefly describe the recent contributions in the relevant literature and point out why the proposed solutions are still unable to address adequately the issues concerning the nature of the firm, the way in which the market copes with changes, and the causes of economic development. Second, we demonstrate that the model of the entrepreneur-centered economy is naturally suited to deal with these questions. The balance of this paper is divided into two additional sections; Section II deals with issues concerning the firm while Section III with the remaining issues.

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II. On Nature and Boundary of the Firm

It is commonly agreed that the presence of market uncertainty serves as the primary underlying cause for the firms to exist.[1] Four immediate causes are identified in the literature: The firm is organized in order to (1) break the impasse created by a lack of consistent resource commitment among risk averse resource owners [Knight], (2) gain advantage of risk sharing [Portfolio Theorists], (3) reduce shirking by workers who

engage in joint production [Alchain and Demsetz], and (4) avoid the high cost of using the market [Coase]. Although all these views enjoy wide support in the literature, perhaps the Coasian theme is most popular. Ronald Coase [1937] cited transaction cost as a reason for the firm to exist. In a world of uncertainty, the resource owners must incur information costs which the perfect market freely provides. Moreover, it is also costly to negotiate and enforce contracts. The magnitude of these uncertainty related transactions costs will decrease if a firm is created to coordinate production. A Coasian entrepreneur is one who signs contracts with each resource owner "whereby…for a certain remuneration [the resource owner] agrees to obey the direction of an entrepreneur within certain limits." In this way, a firm is created to coordinate production and thus enables its activities to bypass the rule of the market.

To assert that there exists a distinct allocative role for the firm is to imply that the firm and the market become two alternative modes of resource allocation and must share this responsibility. The crucial question is how do the firm and the market divide up the allocative tasks. This question is taken to be equivalent to the question where does the firm end and the market begin. There are two approaches in the literature—the behavioral approach and the cost approach. Neither approach is wholly satisfactory.

The behaviorists [Cyert and Marsh, 1963] advocate the cooperative view of the firm and claim that outside the firm, agents' relationship is short lived and they behave impersonally and non-cooperatively, whereas, within the firm, the agents' relationship is enduring and they behave cooperatively. The behavior-based theorists insist that it is this transformation from individualistic behavior in the market to cooperative behavior in the firm that sets the firm and the market apart. Unfortunately, this approach is not

satisfactory because it is not difficult to find examples of long-run oriented contracts between independent buyers and sellers who cooperate with each other in order to exploit mutually beneficial market opportunities. If so, the boundary between the firm and the market is blurred.

The cost-based theorists [Coase, 1937] start with the proposition that the use of the internal decision apparatus of the firm is not without cost; otherwise, they reason that there would be no way to prevent the firm from expanding indefinitely and thus eliminating market transactions altogether. According to Ronald Coase, there exists a diminishing return to the entrepreneurial function; as the number of internal transactions increases, the probability of failure by the entrepreneur to make the best utilization of the factors of production also increase. In the words of Arrow [1974], it is the overloading of information and decision making capacity of the entrepreneurial authority that brings the firm to its limit.

Because there exists a cost of either using the firms or using the market, neither the firm nor the market can operate exclusively without the other. A firm will expand until the cost of organizing an extra transaction within the firm becomes equal to the cost of carrying out the same by the market. Thus, by substituting at the boundary, Coase and his followers solve the boundary problem between the firm and the market. Unfortunately, because the existence of an internal inconsistency, the cost-based theory is also unsatisfactory. To see this, we need to observe that the Coasian argument involves two parts. First, the entrepreneur employs inputs authoritatively, and second, the boundary between the firm and the market is determined by equating the marginal cost of using the firm with that of using the market. Once this boundary is identified, then the

marginal productivity of the entrepreneur becomes known and the market price for the entrepreneur is determined. In other words, the activities of the entrepreneur are now subject to market discipline. Because the productivity of the entrepreneur is derived from the productivities of the factors that he employs, the marginal productivity of the entrepreneur must reflect the marginal productivities of these inputs. Since the entrepreneur's own reward is subject to market discipline, it is hard to imagine that his employment of the factors of production can be immuned to the same discipline. Under these circumstances, the entrepreneur's private decision rule must be superseded by the market criterion. Consequently, if one wishes to accept the second part of the Coasian argument, one must reject the first part that the entrepreneur does allocate inputs in a purely authoritative fashion. There cannot exist a separate decision mechanism for the firm! With the entrepreneur's independent prerogative vanishing, so does the Coasian delineation of the boundary between the firm and the market.

The entrepreneur-centered theory can shed light on the nature of the two-tier (dual) allocation between the firms and the market and help to settle the associated boundary issue. Based upon the brief description of this model given in the previous section, we see that contrary to the popular belief, the firm does not use non-market means to allocate all resources internally. Instead, it allocates only the non-tradable entrepreneurial services through cooperative bargaining among the entrepreneurs but allocates tradable factor services by the price mechanism. This fact implies that the issues "how the firm and the market divide up the allocative role" and "where the firm ends and the market begins" are not equivalent. This is not to say that the unique way of allocating entrepreneurial services in the firm does not have any impact on the employment of other

factors. On the contrary, because the allocation of the entrepreneurial services simultaneously determines the firm's production policy, it is necessarily true that this allocation determines the firm's demand for the tradable factors of production and the supply of its products. What we wish to say is that the firm's boundary had little to do with how the allocative responsibility is divided between the firm and the market. The only exception occurs whenever all factor owners have opted to act as entrepreneurs. Only in this case will the boundary of the firm serve to separate the ways that the firm and the market allocate resources [Wu 1989, Chapter 6].

The above discussion makes it abundantly clear that the literature has erred in characterizing the precise nature of the two-tier allocative mechanism in the market economy. Because it is believed that the entrepreneur allocates all inputs of the firm by non-market means, the literature concludes that by simply identifying the boundary between the firm and the market, one can discern the division of the allocative responsibility between the entrepreneur and the market. Since the entrepreneur do not, in general, allocate all factors of production but their own services by non-market means, it is not the existence of the boundary between the firm and the market that gives rise to the two-tier allocation of resources. Rather, it is through the unique way that the entrepreneurs allocate their own services that the two-tier system is manifested. Because the entrepreneurs play a central role in the firm, the allocation of their own services inevitably affects the firm's production policy and thereby indirectly affects the level of inputs employed and outputs produced. Perhaps it is this indirect effect that gives many economists the impression that all factors of production are subject to the direction of the entrepreneurs.

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III. On Equilibrium and Growth

Recall that the neoclassical model assumes the market is complete, all state prices are known, and the exchange rates between periods and states are well defined. Futures markets which open in the current period take the place of the spot markets which would have to be opened sequentially. Exchanges are all contracted and paid for in the current period on the basis of the equilibrium futures prices. Since the futures prices in the current period provide accurate forecasts of the equilibrium spot prices in the various dates and events, equilibrium plans in today's futures markets mirror the set of equilibrium actions in the sequential spot markets. Thus, expectations are identical to realizations. This consistency between plans and actions is significant because it is only when this condition is met will today's optimal choices remain optimal in the future and will the choices made today be truly rational. This hall mark of the Arrow-Debreu equilibrium has served as a standard for all modern neoclassical theories to emulate.

The equilibrium analyses in the post Arrow-Debreu era incorporate uncertainty by dealing with general equilibrium in the incomplete market setting. Incomplete market, in the present context, means the absence of some futures markets. A lack of such markets requires that tradings of the associated physical goods take place sequentially in spot markets at future dates. Since equilibrium among periods and states are mutually dependent, the inability of agents to accurately forecast prices that will prevail at future dates implies that the current market equilibrium is also indeterminate. Thus, due to a lack of full price information, the market is prevented from fulfilling its coordinating rule. A market failure results.

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1. Neoclassical Revisions

In recent years, mainstream economists advocate that there indeed exist mechanisms for agents to forecast future prices and thereby avert this market failure. In a seminal paper, Roy Radner [1972] demonstrates that by using a two-step procedure, common expectations of prices among agents can indeed be assured. First, the expectations of the future environment are objectively formulated by observing the historical evolution of the market environment which is deemed to be a common knowledge, and second, given the expected future environment and the assumed commonly known law of the market, each agent formulates expectations about future spot prices. Moreover, by virtue of the above assumptions, these expectations are common to all agents. With the aid of a set of common expectations of the future spot prices and the knowledge of current prices, optimal individual plans for both the consumer and the producer will emerge. As these plans are implemented, the market would clear at each date-event pair. This result implies that plans and actions are indeed consistent.

In an attempt to soften the strong assumptions employed in this path-breaking model, a large body of literature, e.g., under the rubric of rational expectations [Radner, 1979] and temporary equilibrium analysis [Grandmont, 1977], has emerged. Due to the lack of space, we are unable to survey this literature here. It suffices to state that these models in a variety of ways postulate that agents can start with different information about the environment and with different hypotheses about the law of the market. Learning processes have to be added to allow a convergence of environmental information and of the law of the market to its true self. Thus, through learning, agents

adjust their behaviors and the market moves towards an equilibrium. At this equilibrium, expectations become self-fulfilling and plans and actions again become consistent.

Thus, despite the lack of some futures markets, through the agents' uncanny ability to correctly forecast future spot prices, the missing futures markets are sidestepped and an equilibrium is generated. In this regard, the Radner economy conforms closely to the Arrow-Debreu economy. The only difference is that in the Arrow-Debreu model the future is telescoped to the present, whereas in the Radner case agents, at least through learning, are all clairvoyant. In both cases, plans are made correctly with common information and unfailing expectations; all resources are efficiently allocated.

Restoration of market equilibrium notwithstanding, it is evident that the neoclassical model is devoid of endogenous growth. However, growth phenomenon does take place under the circumstance that the economy is currently not in the steady state equilibrium [Solow, 1956]. Because current resources can either be used for current consumption or be invested in capital stock for the purpose of producing goods for future consumption, the issue is how should consumption, hence investment, be determined so that the consumer's utility derived from a stream of consumption over time is maximized subject to the appropriate technological and resource constraints. Take consumer preferences, production technology, labor endowment in each period, as well as initial capital endowment as given, this choice problem is well defined. Assuming that preferences and technology are convex and that there are no external effects, then the consumer choice problem generates a competitive equilibrium growth path which is also efficient. On this growth path, per capita output (as well as capital stock and its price) grow at a constant rate. In the absence of any technological innovation, the per capita

output converges to a steady state equilibrium value. At this point, growth of per capita output ceases to take place. Because genuine growth must be brought about by external changes in technology or in the pattern of labor supply, there is no endogenous growth in this economy.

The above characterization of growth in the neoclassical economy is challenged by the new growth theorists. According to these theorists, investment in knowledge [Arrow 1962, Romer 1986] or in human capital [Lucas, 1988] often promotes increasing returns to scale and generates external effects and thus causes a sustainable endogenous growth. The basic idea is that there is a trade-off between using resources for current consumption or investing it to produce more consumption in the future. Investing resources or time for either the accumulation of knowledge or human capital not only increase their own productivities but through spillover effects also contribute to the productivities of other factors of production. Consequently, investing in knowledge and human capital leads to increasing returns in outputs as well as generating positive externalities. However, the presence of these external effects causes the optimal growth path to deviate from the competitive growth path. At any moment in time, investment in knowledge and human capital will lie below the optimal level. Under-investment of these activities notwithstanding, with the presence of externality, per capita output can grow monotonically over time and is sustained by the growth in knowledge and human capital.

As a consequence, the neoclassical model now depicts the economy as a perpetual growth machine capable of growing monotonically without bound. However, this pattern of growth still lacks true endogeneity. To see this, let us use the popular metaphor which depicts the market as a pre-programmed system operating under the control of an

auto-pilot which is designed to bring the market into equilibrium. Once this equilibrium (whether a steady state equilibrium or a perpetual growth equilibrium) is attained, no forces endogenous to the market can dislodge it. Change in this context is meant adjustment towards the equilibrium, not an alteration of the program. Any such program change must still be intitiated from a source outside the market system. The neoclassical model's inability to deal with program changes also implies that whenever there exist multiple equilibria, the market is incapable of making a choice among them even if these equilibria are well ranked. This inability to choose is the root cause of the "coordination failure problem" referred to in the literature [Hart, 1975].

Moreover, the new growth theory is found wanting for another reason. Inspection of the historical data makes it clear that no economy grows at the alleged monotonic pattern. A typical economy, instead, grows in spurts and exhibits peaks and valleys. Efforts are already underway to incorporate this phenomenon in the model [Aghion and Howitt, 1992]. To do so, researchers have to reach out to a much older literature for inspiration and help. It is to this literature we now turn.

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2. The Entrepreneur-Centered Economy Model

Long before the revised neoclassical economics came into vogue, another group of economists advocated that the market failure caused by a lack of full market information could be averted with the assistance of entrepreneurs. The entrepreneur, instead of relying on the objective knowledge provided by the market, uses his subjective judgment of the market situation to make production decisions. Because of his willingness to bear consequences associated with these decisions, according to Frank

Knight [1971], production is restored and the market revived. In addition, entrepreneurs also serve as agents of change. The presence of uncertainty places a veil over market opportunities; a state of disequilibrium prevails. The Austrian economists [Kirzner, 1973] believe that in a disequilibrium situation, entrepreneurs do not choose "equilibrium behaviors" but merely make plans to exploit "hitherto unnoticed" profit opportunities. As these opportunities are discovered and profits reaped, the existing plans become obsolete. Plans are modified to reflect the new market situation. In this manner, the market participants interact to generate market forces thereby setting the market process in motion. When all profit opportunities are exhausted, the market reaches a state of equilibrium. This equilibrium is, however, not permanent. In Schumpeter's view, the capitalist economy is inherently dynamic. "It incessantly revoluntionizes the economics structure from within." The source of this revolution is economic development led by the innovator-entrepreneur [Schumpeter, 1934]. Through innovation, imitation and competition, the economy propels forward and upward.

The entrepreneur-centered economy model referred to in the introductory section represents a first attempt to formally model an economy embracing the above-mentioned features. Although the two period intertemporal equilibrium model used thus far does not explicitly include all activities that entrepreneurs perform, by extending to a multiperiod setting the defining properties of this economy can be deduced.

Because the model is designed to explain the formation of the firm and the origin of financial securities, naturally it needs to focus on the activities in the first period. In order to meet this requirement, a temporary equilibrium methodology is adopted. Recall that a temporary equilibrium is determined at any given time by the interaction of agents'

current decisions and their expectations about the future. In the present case, the entrepreneur uses his judgment to formulate expectations about the future. These expectations involve not only relevant future events but also a scenario as to how his own participation in production will affect the outcome of these events. Based upon these expectations, entrepreneurs take the initiative to organize firms by playing a cooperative game with each other. At the conclusion of this game, not only firms with specific size and internal organization emerge, each firm's production policy and financial structure is also determined. As time elapses, the economy moves from one temporary equilibrium to the next.

However, temporary equilibrium in the entrepreneur-centered economy differs from that of the neoclassical economy in a fundamental way; this equilibrium does not converge to a long-run limit. When decisions are made by the entrepreneurs on the basis of judgment, the fact that the entrepreneurs' market scenarios may differ means that profits can be had not only from unexploited market opportunities but also from entrepreneurs betting with each other. The existence of betting behaviors is evident by the presence of bulls and bears in the same market. The optimistic bull will buy and the pessimistic bear will sell. The result is a betting equilibrium. Because the betting equilibrium possesses properties different from the neoclassical equilibrium, the market's propensity to be in a betting equilibrium naturally implies that it will not converge to the long-run neoclassical equilibrium.

In addition, decisions based upon judgment also alter the notion of rationality. Now discrepancy between expectations and realization may simply represent an acceptable variation of the perceived scenario or be deemed as caused by other agents'

erroneous betting behavior; no indictment of the entrepreneur's rationality is implied and no change in the firm's policy is warranted. However, entrepreneurs are realistic individuals; they do realize that no one is infallible and misjudgments do lead to suboptimal policy decisions. Corrections must be made when mistakes are made. Since revision of policies are costly, rationality now requires that the choice of policy be made to minimize the long-run cost of adjustment induced by policy revisions. A change in the criterion of rationality has taken place.

The presence of entrepreneurs not only affects the nature of equilibrium but also affects the way that equilibrium changes from one to another. There are two causes for changes, one passive and the other revolutionary. The passive change takes place as result of routine adjustment following a judgmental shift in the underlying market conditions. The revolutionary change, on the other hand, takes place whenever the entrepreneur through his own innovative efforts has altered the fundamental market conditions. This revolutionary change is the source of economic development.[2]

Following Schumpeter [1934], economic development is defined as "carrying out new combinations;" it is a pure endogenously generated process involving three stages: invention, innovation and imitation. Invention is the technical discovery of new things or new way of doing things; innovation is the successful commercialization of invention; and imitation is the market process which widens the adoption of a new product or process. A development is started by the entrepreneur who commits to innovation in order to create profit opportunities for himself. Because "entrepreneur is not a profession," once an innovative act is committed, the entrepreneur loses his status as an entrepreneur. As a result, the entrepreneur does not benefit permanently through the

development process; he merely serves as a catalyst to economic development. On the other hand, because this development process first destroys the existing market equilibrium and then ultimately brings the market into a equilibrium superior to its predecessor, society now attains a higher level of satisfaction as well as wealth. Since society is the ultimate beneficiary of innovation, Schumpeter characterizes economic development as a process of "creative destruction."

Moreover, because economic development is initiated by the entrepreneur, the involvement of a human element in the development process make economic development a non-routine matter; unlike the neoclassical case, development is spontaneous and unpredictable. Schumpeter, therefore, emphasizes that economic developments occur in spurts and tend to cluster together. Because income generated from each development levels off over time, this pattern of development induces a wave-like historical income record. In this way, Schumpeter integrates the theory of economic development with the theory of business cycle, a feat which is still emulated by present-day growth theorists [Greiner and Hanusch, 1994].

Although a formal growth model under the rubric of the entrepreneur-centered economy is not yet available, the structure of the Wu-Qin model suggests that such a growth model would embrace the basic features of the Schumpeterian theory. Two aspects of the entrepreneur-centered economy model further enrich the theory of economic development.

First, in the Schumpeterian framework, innovation is always a result of an entrepreneur's conscious effort directed explicitly towards this purpose. In contrast, in the entrepreneur-centered economy, innovation may be a byproduct of other entrepreneurial

activities [Wu and Qin, 1996]. Since the firm is a coalition of entrepreneurs, each entrepreneur's share of the firm's profit depends on his relative position in the internal organization of the firm. Because an entrepreneur's relative position is determined by his contribution to the configuration of the firm's production set, each cooperative entrepreneur, in an attempt to improve his relative share of the firm's profit will strive to bring forth an expansion of the firm's production set. Although this effort is motivated by the entrepreneur's attempt to improve his relative position within the firm, nonetheless, innovation takes place as a consequence.

Second, the entrepreneur-centered economy model sheds new light on another aspect of economic development central to classical economics but largely neglected by modern economists. Recall that the classical economist cites the extension of the market as a key source of economic development. In an entrepreneur-centered economy, this avenue of development is indeed widely employed [Wu, 1989, Chapter 9; 1996, Chapter 1]. Because entrepreneurs in this economy assume a broader role then the one envisaged by Schumpeter, besides carrying out innovations, they also bear risks and perform other creative acts. For example, in an incomplete market setting, entrepreneurs not only must convert input into outputs but also concomitantly create markets for these products. Sometimes markets can be created only by the entrepreneur's willingness to internalize some market uncertainties and by his ability to mobilize supports of complementary nonmarket institutions (e.g., legal supports). Numerous new markets and institutions are still being created in this way today. Markets on the Internet and financial markets for new derivatives are cases in point. Because entrepreneurs and the market complement each other in the allocation of resources, as new markets are created and the market

becomes more complete, the role played by the entrepreneur also adjusts to become more specialized. These adjustments, in turn, lead to the streamlining of the firm's internal organization. For example, the development of the information industry and the complementary legal institutions has led to a decentralization of the firm's internal decision processes and thus greatly enhances its efficiency. In short, because entrepreneurs contribute to technological advances as well as to the size and efficiency of the market, both technological improvements and market extensions have served to bring about economic development.

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Concluding Remark

This paper introduces the entrepreneur-centered economy model and contrasts it with the traditional neoclassical model. The fundamental difference between the two models is the modeler's perspectives of the market economy. The neoclassical economist views the economy as an automated system wherein the market works itself; in contrast, the advocator of the entrepreneur-centered model perceives the economy as an interactive system in which the market works in conjunction with the entrepreneurs. The inclusion of entrepreneurs as active players in the market place has greatly improved the generality, realism and the explanatory power of the model, at least concerning the nature of the firm, the market process, and the cause of economic development. The entrepreneur-centered economy model, therefore, merits greater attention and scrutiny. Many more implications of this model await to be explored and much remains to be done. We hope that this brief presentation has stimulated the reader's interest in the entrepreneur-

centered economy and thus has served to convert the reader into an active researcher on this topic.

Notes

1. Another branch of the literature identifies monopoly as a cause for the firm to be an independent resource allocator. This literature evolves to include managerial theories of the firm, agency theories, etc. Due to a lack of space, we shall not deal with these topics here.
2. We distinguish growth and development by the fact that growth can take place without the aid of any agent while development cannot.

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