Entrepreneurial Activities: A Microeconomic Analysis

Vincy Fon[1] – Ying Lowrey[2]

ABSTRACT. People have different preferences for performing entrepreneurial activities. These differences can be influenced by actions of the state. Individual behavior in choosing employed work or entrepreneurial activities is first examined and then aggregated. Equilibrium is given by the balance of aggregate supply of and aggregate demand for entrepreneurial activity. States can promote more aggregate supply of entrepreneurial activity through enticing or encouraging individuals, or they can make institutional changes to increase aggregate demand for entrepreneurial activity through domestic or global markets. The result is more entrepreneurial activities realized over time, so that greater economic growth can be achieved.

1.   Introduction

This paper provides a microeconomic analysis on entrepreneurial activities in the tradition of Joseph Schumpeter. Entrepreneurial individuals offer new products or new processes or they perform old tasks by new and improved means.[3] This Schumpeterian tradition has been further developed by Israel Kirzner, focusing on human actions that result in changes, and by William Baumol, advocating extensively that entrepreneurial activity is "not routine" activity.[4]

Such Schumpeterian entrepreneurial activity not only appears in scholarly discussions but is measured by statistical proxies in many nations. The U.S. labor statistics categorize two major labor supply activities: salary and wage earning and self-

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[1] The George Washington University, Department of Economics. We would like to thank Dan Milkove for his help and encouragement.
[2] U.S. Small Business Administration and the George Washington University.
[3] Entrepreneurial activities mean "simply the doing of new things or the doing of things that already being done in a new way (innovation)." In addition, "the entrepreneur 'gets things done'." See Schumpeter (1947), p.223 and p.224.
[4] Baumol (1983: 30) identifies entrepreneurial activity as that which "involves exercise of imagination, departure from standard practice, acuteness of perception that permits the rapid recognition of new opportunities…, and the use of innovative means to take advantage of them."

employment. Self-employment has long been used by economists to study various characteristics of entrepreneurial activities. According to United States Census data, in 2005 more than 20 million U.S. businesses were counted as nonemployer businesses, creating more than 951 billion dollars in receipts.[5] Among these nonemployer organizations, 86.9 percent are individual proprietorships and 6.6 percent are partnerships. Thus, most nonemployers are self-employed individuals operating small unincorporated businesses, which may or may not be the owner's principal source of income.

This article starts with the premise that people have different preferences with respect to carrying out entrepreneurial activities. Some individuals are more talented, energetic and adventurous in nature than others, and they like to try new things. Those who find the routine of repeating the same activities under regular employment tedious may be more inclined to take risks and to enjoy the success arising from hard work and determination. Others find taking orders from their superiors undesirable, and value the freedom of doing things their own way. Still others may have more confidence in their ability to create their own destiny rather than staying in a steady environment created by their employers. Whatever the reasons, we begin with the assumption that some people are more entrepreneurial than others.

Besides hypothesizing that endowments reflect different preferences for taking on entrepreneurial endeavors, we assume that individuals' preferences can be altered, albeit slightly or slowly. People's preferences can change, induced by changes in attitudes of the society that originate from domestic incidents or international exchanges and experiences. More importantly, preferences can be influenced by policies adopted by the government. One example is from China in the last three decades. Before economic reform took place in 1978, free enterprise was not permitted; any attempt to organize business activity was strictly prohibited. Besides working in the government, the second best employment choice was working for state-owned enterprises. The economic reform

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[5] A nonemployer business is one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the construction industries), and is subject to federal income taxes.

and open door policy profoundly unleashed China's supply of entrepreneurship. More and more successful entrepreneurs have become role models for citizens of the nation.

People's attitudes and preferences are taken as stable in the short-run. Given the different returns to employed and entrepreneurial work and endowed with his own entrepreneurial preference, an individual allocates his time being employed or entrepreneurial. As different individuals are endowed with different entrepreneurial talents and preferences, some choose employed work exclusively, others split their time as an employee and being entrepreneurial, and still others devote full time to entrepreneurial work. Summing entrepreneurial activities across all individuals in the economy gives rise to the aggregate supply of entrepreneurial work. Determinants of the aggregate supply of entrepreneurial work include the rates of return to employed and entrepreneurial work and the social preference.

Among other factors, the aggregate demand for entrepreneurial activity depends on the state of the domestic and global economies, the technical frontier of industrialized nations, the state of global infrastructure, and the skill, training, commercial adaptability, and technical knowledge of the current workforce. While all these factors *potentially* influence aggregate demand for entrepreneurial work in a country, institutional constraints play an important role. For example, consider a country full of unnecessary bureaucracies and corruption. Even with a strong potential export demand for entrepreneurial activity from overseas, and a population anxious to perform this entrepreneurial work, the potential increase in aggregate demand could be choked off or greatly reduced by burdensome and unfriendly bureaucratic regulations. Likewise, without open trade and a hospitable environment for foreign and domestic firms, the possible increase in aggregate demand for entrepreneurial work may not be brought to light.

The interaction between aggregate supply of and aggregate demand for entrepreneurial activity determines equilibrium entrepreneurial activity in the economy. As mentioned, people's preferences may turn more amenable to entrepreneurial activity,

inspired by favorable government policy changes or by current events. This increase in the aggregate supply of entrepreneurial activity leads to more equilibrium entrepreneurial activities. In a similar vein, through favorable institutional changes or by making the economy more open and accommodating to foreign firms, an increase in the aggregate demand can be encouraged and realized, especially when the global economy is strong. An increase in aggregate demand for entrepreneurial work also leads to greater equilibrium entrepreneurial activities.

In the following, section 2 reviews related literature. Section 3 provides an individual's utility maximization model and discusses how different behavioral patterns concerning the supply of individual entrepreneurial activity may arise. Section 4 highlights the properties of the aggregate supply of entrepreneurial activity. Section 5 discusses aggregate demand for entrepreneurial activity and market equilibrium as well as comparative static results initiated by an increase in the aggregate supply of or aggregate demand for entrepreneurial activity. Section 6 draws some policy implications on how to stimulate entrepreneurial activities in an economy and concludes.

2.   *Related Literature*

The discussion of heterogeneous agents in economic literature has been extensive. In entrepreneurial studies, Schultz (1980) focuses on education in entrepreneurial ability, and McClelland (1971) stresses the widely recognized "need to achieve" issue in promoting entrepreneurial activity and economic growth. Jiang, Wang and Wu (2004) investigate heterogeneity in entrepreneurial ability, adopting an endogenous growth overlapping generations model. Focusing on the intrinsic character and the self-gratification aspects of entrepreneurs, Lowrey (2003, 2006) explores the behavior of an individual whose entrepreneurial effort provides positive utility in a representative agent model. Following the tradition, this paper assumes that different consumers take pleasure but have different preferences in performing entrepreneurial work.

Baumol (1983, 1993) discusses two important aspects of encouraging more entrepreneurial activities: rewards to entrepreneurship and institutional constraints. He points out important factors beyond earnings or other pecuniary rewards that matter to entrepreneurship. For example, entrepreneurial activities can be encouraged by awarding medals, special titles, or even titles of nobility. The reward may even be intangible and unofficial, taking the form of peer approval. Entrepreneurship can also be pursued as part of the search for power or because of the love of accomplishment. Nevertheless, Baumol believes that "money is a prime reward of entrepreneurial effort." Baumol lists institutional constraints such as taxes, complicated, overreaching, and stiffening laws and regulations, and egregious administrative actions as impediments to entrepreneurial activities. In sum, Baumol emphasizes the importance of the reward structure setting and institutional changes in promoting entrepreneurship. If an economy is equipped with a favorable payoff system and rules that promote sustainable economic development and growth, demand for entrepreneurial activities should be high.

Discussions on institutional constraints are not merely theoretical, as empirical studies support limitations of institutional settings on entrepreneurial activities. Parker & Robson (2004) use OECD data to explain international variation in self-employment activities, and find that self-employment rates are positively and significantly related to personal income taxes and negatively and significantly related to unemployment benefit rates.

Godley (1994) compares the supply for entrepreneurship among Jewish immigrants of 1880-1914 in London and New York. He initially hypothesizes similar supply characteristics and expects the supply of entrepreneurship to vary uniformly with the return to entrepreneurs. But the hypothesis was not confirmed. Among Jewish immigrants, entrepreneurial supply was disproportionately higher in New York than in London. Godley concludes that Jewish immigrants' supply of entrepreneurship reflected not only price signals but host cultural values as well.

3.   *Individual Supply of Entrepreneurial Activity*

Consider an individual who enjoys income Y, finds displeasure when providing employed labor L, but derives joy in carrying out entrepreneurial activity/effort/work E.[6]   The preference of such an individual is given by the utility function $U(Y,L)+V(E;\alpha,\beta)$, where $U_Y > 0$, $U_L < 0$, and $V_E > 0$.[7] It is assumed that the utility function is well-behaved and strictly quasi-concave. Note that the function V depends on the amount of entrepreneurial activity carried out as well as the parameters α and β.

For different individuals, the components of the utility function U and V may be different. For convenience, assume that U and V are the same for all individuals but different individuals may have different values of α .   That is, individuals are parameterized by α, representing the degree to which an individual enjoys performing entrepreneurial work. It could represent the individual's internal drive, willingness to undertake new initiatives, tolerance for risk, need for achievement, leadership skills, etc. The higher the value of α, the more receptive the individual is entrepreneurial work. More precisely, the higher the individual's α, the higher is his marginal utility of entrepreneurial work (or, $V_{E\alpha} > 0$).   We will refer to those with higher values of α as more entrepreneurial individuals. When the rate of return for entrepreneurial activities is fairly high, we expect the more entrepreneurial individuals to carry out some entrepreneurial activity while less entrepreneurial individuals may not.

Parameter β reflects society's influence on an individual's preference to be entrepreneurial.   It captures institutional changes, public policies, and incentive mechanisms that affect an individual's inclination to be involved in entrepreneurial activities. For example, if the government wants to encourage entrepreneurial activities, it may create a pecuniary or non-monetary award for those who make significant contributions to their communities' economic development through creative

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[6] Income Y is a composite consumption good and its price is normalized to one.
[7] To highlight the role of entrepreneurial activities, we make the simplifying but unnecessary assumption that entrepreneurial activities are separable from income and employment activities.

technological or social activities. For convenience, we refer to β as the social parameter. The higher the value of β, the more the individual is induced to enjoy entrepreneurial work. More precisely, the higher the value of β, the higher is an individual's marginal utility of entrepreneurial work ($V_{E\beta} > 0$).

If the individual works as an employee, the unit wage is w; if he chooses to perform entrepreneurial work, the expected unit return is r. Assume that the individual allocates a fixed amount of time T between being employed (L) and working on entrepreneurial activities (E).[8] The budget constraint facing the individual is then $Y = wL + rE$.[9] The utility maximization problem confronting a typical individual is given by the following:

$$\max_{Y,L,E} \ U(Y,L)+V(E;\alpha,\beta) \ \ s.t. \ Y = wL+rE,$$
$$L+E = T, \ E \geq 0, \ T \geq E. \tag{1}$$

Highlighting the choice of entrepreneurial activity, (1) can be simplified to:

$$\max_{Y,E} \ U(Y,T-E)+V(E;\alpha,\beta) \ \ s.t. \ Y = w(T-E)+rE,$$
$$E \geq 0, \ T \geq E. \tag{2}$$

Set up the Lagrangian function to solve problem (2):

$$\mathcal{L} = U(Y,T-E)+V(E;\alpha,\beta)+\lambda(w(T-E)+rE-Y)+\mu(T-E).^{10}$$

That the individual's utility function is strictly quasi-concave means that the Kuhn-Tucker conditions, given by (3) – (6), become necessary and sufficient for the optimum:

$$\mathcal{L}_Y = U_Y - \lambda = 0 \tag{3}$$

$$\mathcal{L}_E = -U_L + V_E - \lambda(w-r) - \mu \leq 0, \ E \cdot \mathcal{L}_E = 0 \tag{4}$$

$$\mathcal{L}_\lambda = w(T-E)+rE-Y = 0 \tag{5}$$

$$\mathcal{L}_\mu = T-E \geq 0, \ \ \mu \cdot (T-E) = 0 \tag{6}$$

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[8] Since the supply of labor for entrepreneurial activity (versus employed labor) is the theme of the study, we make the simplifying assumption that the total amount that an individual devotes to labor is fixed (T). This means that the choice between leisure and labor is slighted. In fact, leisure does not enter the utility function $U + V$.

[9] That the budget constraint is written as an equality is an implicit assumption that the individual does not reach a point of satiation inside the constraint set.

[10] This Lagrangian function is set up so that the multipliers λ and μ are nonnegative, and the non-negativity constraint $E \geq 0$ is taken care of implicitly in the Kuhn-Tucker conditions.

First, consider the corner solution in which $E = 0$. $E = 0$ implies that $T > E$; the second part of (6) then implies $\mu = 0$. Combining the first part of (4) with (3) and $\mu = 0$ and rearranging terms, the optimality condition for the corner solution with no entrepreneurial work becomes the following:

$$r + \frac{|U_L| + V_E(0)}{U_Y} \leq w \qquad (7)$$

The second term on the left hand side of (7) is MU_E / MU_Y, or, $\Delta Y / \Delta E$ along an indifference curve in the E–Y space. This ratio represents how much each extra unit of E is worth to the individual, measured in terms of income Y. It is the subjective worth of an extra unit of entrepreneurial effort to the individual. The left-hand side of (7), the market (objective) return r plus the subjective return $(|U_L| + V_E)/U_Y$, then represents the *total return to entrepreneurial work*. When the total return to entrepreneurial work is less than the return to employed labor, clearly employed labor is better and less entrepreneurial activity should be performed. In the limit, if the total return to entrepreneurial work is less than or equal to the return to employed labor, no entrepreneurial work will be performed.

All other things equal, the corner solution with zero entrepreneurial work is more likely for individuals with relatively low values of α, since a lower α implies a lower $V_E(0)$ which makes inequality (7) more likely. That is, given the same returns to entrepreneurial work and to employed work, individuals with lower values of α, the less entrepreneurial individuals, may choose not to provide entrepreneurial work ($E = 0$) while those with higher values of α, the more entrepreneurial individuals, may do so ($E > 0$). To this latter case we now turn our attention.

Second, consider the interior solution in which $T > E > 0$. The second part of (6) and $T > E$ imply that $\mu = 0$. The second part of (4) and $E > 0$ imply that $\mathcal{L}_E = 0$. Combining this with (3) and $\mu = 0$ and rewriting, we have:

$$r + \frac{|U_L| + V_E}{U_Y} = w \qquad (8)$$

The second term on the left hand side of (8) is $\Delta Y / \Delta E$, the subjective worth of an extra unit of entrepreneurial effort to the individual. If, for example, the total return to entrepreneurial work, given by the left-hand side of (8) exceeds the return to employed work (w), the individual is better off putting in more entrepreneurial effort and providing less employed work. If, on the other hand, the total return to entrepreneurial work is less than the return to employed work, then the individual should perform more employed work. Thus, the optimal amount of entrepreneurial activity is established when the total return to entrepreneurial work equals the return to employed work.[11] This is exactly what equation (8) prescribes.

Note that even with no monetary return to entrepreneurial activity so that $r = 0$, (8) can still hold. This means that some α individuals, presumably those with very high values of α and marginal utilities of entrepreneurial work, are willing to carry out entrepreneurial activities even though they do not receive any monetary compensation.

Third, consider the other corner solution in which $E = T$. Then $E > 0$ and the second part of (4) implies $\mathcal{L}_E = 0$. Combine this with (3) and rewrite to obtain $\mu = -U_L + V_E - U_Y(w - r)$. Since μ is nonnegative, the optimality condition for the corner solution with full time entrepreneurial work becomes:

$$r + \frac{|U_L| + V_E(T)}{U_Y} \geq w \qquad (9)$$

Condition (9) specifies that if the individual chooses to perform full-time entrepreneurial work, the total return to entrepreneurial work exceeds the return to employed work. All

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[11] If we assume that entrepreneurial effort E does not enter the utility function, ignore the time constraint for employed labor and entrepreneurial effort, and place the center of attention on employed labor supplied L, the utility maximization problem (2) can be written: $\max_{Y,L} U(Y,L)$ $s.t.$ $Y = wL$. The first order condition of this simple maximization problem produces $-U_L/U_Y = w$ (*). (*) equates the subjective measure of labor supply with the employment wage w. Condition (*) supports the first order condition (8) for the case of an interior solution, with the market return for entrepreneurial effort r and the marginal utility from entrepreneurial effort both incorporated into (8) in a natural way.

other things equal, this is more likely for more entrepreneurial individuals with relatively high values of α.

The possible solutions for different individuals can be considered diagrammatically, with entrepreneurial activity E measured on the horizontal axis and income Y measured on the vertical axis. First, the slope along an indifference curve for any individual is given by $(|U_L|+V_E)/U_Y$, and the indifference curve of an α^- individual must be flatter than that of an α^+ individual, where $\alpha^- < \alpha^+$. This is because a lower value of α corresponds with a lower value of marginal utility of entrepreneurial activity V_E. Thus, the less entrepreneurial individual with a smaller α has a flatter indifference curve than the more entrepreneurial individual with a higher α. Next, note that an individual's budget line $Y = w(T-E)+rE$ extends from the vertical intercept $Y = wT$ to the point $(E = T,\ Y = rT)$, with the slope of the budget line equal to $w-r$. *Figure 1* presents the optimal choices of two individuals: the α^- individual has a flatter indifference curve (the less entrepreneurial individual with the lighter curve), making the corner solution his optimum ($E = 0$), while the α^+ individual has a steeper indifference curve (the entrepreneurial individual with the darker curve), leading to the interior solution as his optimum ($E > 0$).
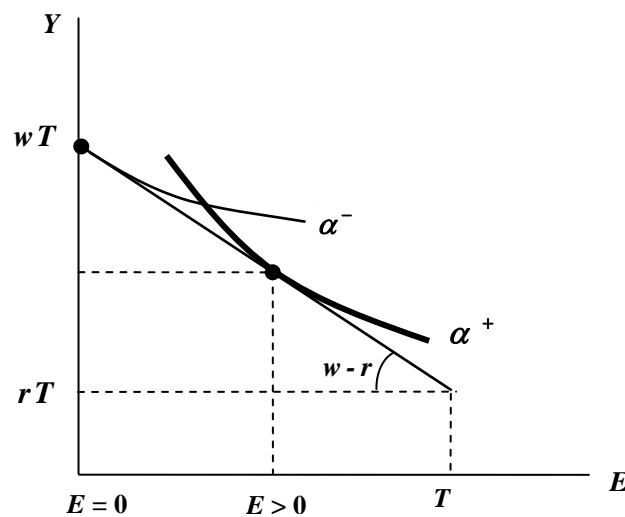
Figure 1. The relatively less entrepreneurial individual (α^-) has flatter indifference curves and chooses no entrepreneurial work.

All other things equal, an individual with a very high α, denoted by α^{++}, may choose to expend even greater effort on entrepreneurial activity. *Figure 2* illustrates the choices for two entrepreneurial individuals with values α^+ and α^{++}, where $\alpha^{++} > \alpha^+$. The α^+ individual (the entrepreneurial individual with the darker indifference curve) chooses an interior solution to provide a positive amount of entrepreneurial work with part of his time, while the α^{++} individual (the very entrepreneurial individual with the dotted indifference curve) chooses the corner solution to work on entrepreneurial activities full time.
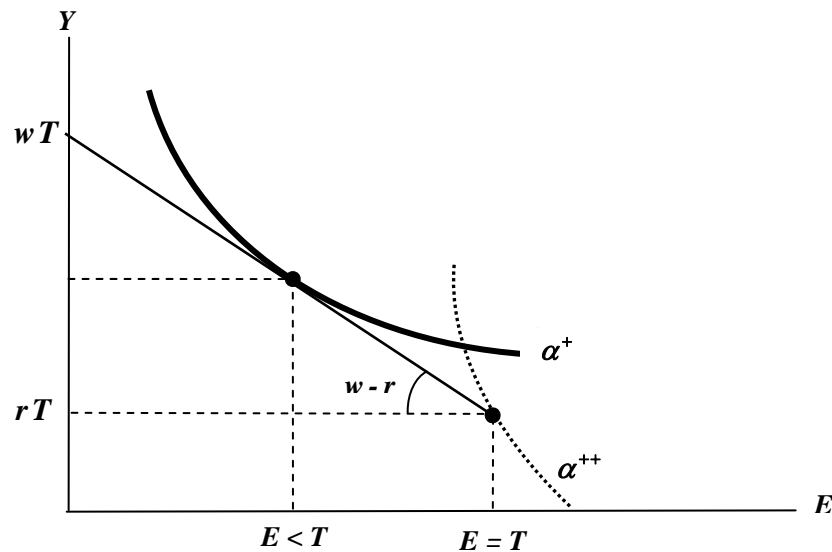
Figure 2. **The relatively more entrepreneurial individual (α^{++}) has steeper indifference curves and chooses more entrepreneurial work.**

Note that the general return to employed labor is implicitly assumed to be higher than the general return to being entrepreneurial: $w > r$. This is likely typical in an economy. Recall that the return to entrepreneurial activity is measured in terms of expected value. Although many successful entrepreneurs can be found, there are also many failed ventures. If the return to being entrepreneurial is higher than the return to being employed, then the budget line will be upward sloping, extending from the vertical

intercept $Y = wT$ upward to the point $(E = T, Y = rT)$. Every individual, however entrepreneurial, will choose to perform entrepreneurial work. An assumption that the return to entrepreneurial work is higher than the return to employed labor thus leads to a trivial and unsatisfactory result.

4.   *Aggregate Supply of Entrepreneurial Activity*

Given the return to entrepreneurial activity r, wage of employed labor w, and the government's or society's preference parameter β, the optimal choice of less entrepreneurial individuals with low values of α may satisfy condition (7) and provide no entrepreneurial activity. The optimal choice of entrepreneurial individuals with higher α may satisfy condition (8) and provide a positive amount of entrepreneurial activity, and the very entrepreneurial individuals with very high α may devote full-time effort toward entrepreneurial activities. The aggregate supply of entrepreneurial work S is given by the sum of entrepreneurial work provided by all individuals in the economy: some perform zero, others perform part-time, and still others perform full-time entrepreneurial work. This aggregate supply of entrepreneurial work S is a function of the return to entrepreneurial activity r, the wage of employed labor w, and the governmental preference parameter β: $S(r, w, \beta)$.

Now consider what happens when the return for entrepreneurial effort r increases. Other things equal, the *total* return to entrepreneurial activity becomes larger, which encourages entrepreneurial work. Zero entrepreneurial activity is no longer optimal for individuals who previously chose not to perform entrepreneurial work, so more individuals devote effort to entrepreneurial activities.[12] For individuals who already provide part-time entrepreneurial work, an increase in r encourages more entrepreneurial effort. Some maintain a degree of employed labor but spend more effort on part-time

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[12] For individuals with low values of α who previously did no entrepreneurial work, inequality (7) was their optimality condition. An increase in r raises the left hand side of (7), which may no longer hold. When this happens, a lack of entrepreneurial work is no longer optimal. These individuals now perform some entrepreneurial activity, making condition (8) instead of (7) their optimality condition.

entrepreneurial work, while others convert to full-time entrepreneurial activities. [13] Individuals who already devote full time on entrepreneurial activity continue to do so after an increase in the return r. In summary, as the return for entrepreneurial activities rises, the aggregate entrepreneurial activity supplied in the market increases: there are new entrants, some part-timers devote more time to entrepreneurial activity, other part-timers turn full-time, and full-timers maintain full-time entrepreneurial work.

To illustrate further, suppose that prior to the increase in the entrepreneurial return r, individuals with values of α greater than α_0 provide some entrepreneurial effort, but individuals with α less than or equal to α_0 provide none. That is, individuals with value α_0 are the marginal individuals choosing no entrepreneurial work before the rise in r. Among the individuals who perform no entrepreneurial work before the increase in r, those with values of α less than but *close to* α_0 have relatively high marginal utilities of entrepreneurial work. Their total returns to entrepreneurial work were slightly less than the return to the alternative of employed work before. For these individuals and the marginal individuals with value α_0, the increase in the return to entrepreneurial work r pushes total returns to entrepreneurial work beyond the return to employed labor w. The optimality condition for zero entrepreneurial work (7) no longer holds, and they start performing entrepreneurial work. *Figure 3A* presents such a transition: as the return to entrepreneurial work increases from r to r^+, the individual alters his choice from C to C' and starts performing part-time entrepreneurial work. Individuals providing positive entrepreneurial work before the increase in r perform more entrepreneurial activities with a higher r. *Figure 3B* illustrates such a case: the individual's entrepreneurial work increases from E to E' when the return to entrepreneurial work increases from r to r^+. Clearly it is possible for the individual represented in *Figure 3B* to increase his entrepreneurial activity from working part time (E) to working full time (T) as the return to entrepreneurial work increases. In summary, an increase in the return to

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[13] The optimality condition was (8) for an interior solution for individuals who provide part-time entrepreneurial work before the increase in r,. When r increases, some continue to find (8) the optimality condition, spending more time on entrepreneurial work. Others find (9) to be the new optimality condition and switch to full-time entrepreneurial work.

entrepreneurial work induces some people to start performing entrepreneurial work and others to perform more entrepreneurial work, resulting in an increase in the aggregate supply of entrepreneurial work.
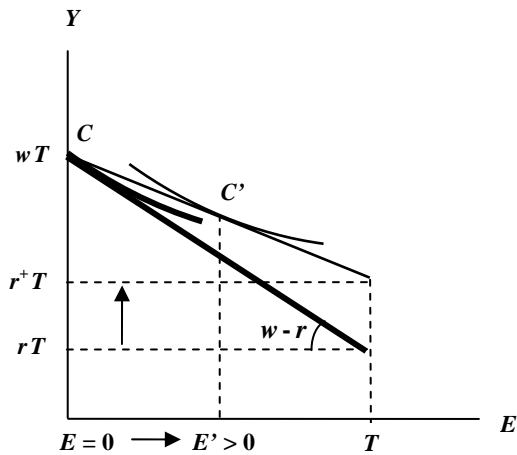
Fig 3A. The not-so-entrepreneurial individual starts performing entrepreneurial work as the return *r* increases.
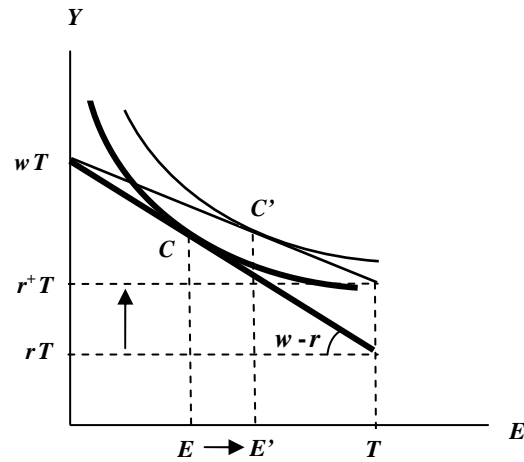
Fig 3B. The relatively entrepreneurial individual performs more entrepreneurial activities as the return *r* increases.

Thus far, the aggregate supply of entrepreneurial work is shown to be an increasing function of the return to entrepreneurial activity: $S_r > 0$. Similarly, an increase in the competing return to employed work makes employment more attractive. Those who chose zero entrepreneurial work continue not to avoid it; previous part-time entrepreneurs provide less entrepreneurial work or none at all; and those who spent full time on entrepreneurial activity may reduce it to part time. Hence the aggregate supply of entrepreneurial work is a decreasing function of the return to employed labor: $S_w < 0$.

Next, an increase in the value of the social parameter β raises an individual's marginal utility of entrepreneurial work because $V_{E\beta} > 0$. The effect on individual behavior is much like the interpersonal comparison analyzed before: an increase in one's

$V_E > 0$ leads to a higher $(|U_L| + V_E)/U_Y$, which in turns leads to steeper indifference curves. An increase in β is similar to turning the α^- individual into an α^+ individual and turning an α^+ individual into an α^{++} individual. As β increases, the prior α^- individual is now an α^+ individual who initiates entrepreneurial activities part-time (*Figure 1*), and the previous α^+ individual is now an α^{++} individual who performs even more entrepreneurial work (*Figure 2*). Thus, the aggregate supply of entrepreneurial work is an increasing function of the social parameter β: $S_\beta > 0$.

     Figure 4 sums up the discussion of aggregate supply. The aggregate supply of entrepreneurial activity is upward sloping: more entrepreneurial effort is expended when the return to entrepreneurial work increases. Further, if an encouraging influence on entrepreneurial effort occurs, the social parameter β increases, inducing the aggregate supply of entrepreneurial activity to shift to the right.
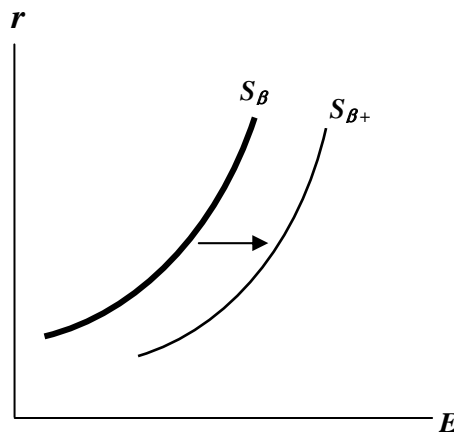
Figure 4. The aggregate supply curve for entrepreneurial activity *S* is upward sloping. It increases as the social parameter β increases, and decreases as the return to employed labor *w* increases (not shown).

     While the aggregate supply of entrepreneurial activity can be pushed upward by encouraging existing entrepreneurs to increase entrepreneurial activities, it is speculated that the increase in supply from new entrepreneurial entrants is as, if not more, important.

When new entrepreneurs start their entrepreneurial adventures, they bring new ideas, novel approaches, vigor, and more excitement to the market. When they start new ventures, they may be more daring, think outside of the box, take more risk, be more receptive to novel ideas, and become more innovative. With new-found excitement, they are more inclined to convince others to join their new ventures. Clearly, when the relative return to entrepreneurial work becomes higher, the aggregate supply increases. But it is also believed that an institutional change making it less burdensome to start new ventures and inducing people to think of an entrepreneurial career as attractive would bring more new entrepreneurs. In other words, adopting the right public policy to increase the social parameter β may be a very effective means of encouraging more entrepreneurial activities. For example, in the U.S., the federal government, many local governments, business corporations, and non-governmental organizations have formed supporting networks to assist African Americans for business startups and growth in recent years. Between 1997 and 2002, African American business ownership increased 45 percent while it increased only 10 percent nationwide.

5.   Aggregate Demand for Entrepreneurial Activity and Market Equilibrium

The aggregate demand for entrepreneurial activity depends on the current state of the domestic economy, and just as, or more importantly, on foreign markets as well. When the domestic economy is strong, more entrepreneurial activities can further enhance the performance of the economy and are desirable. When the economy is open and hospitable to foreign firms and multi-national corporations, more overseas demand for entrepreneurial work can be expected. The current state of technology also matters. For example, during the Information Technology revolution, demands for newer services, better and newer ways of production, new markets, and more inventions become stronger; thereby more entrepreneurial activities are demanded. Further, when the global infrastructure is improved and ready to be exploited, the demand for domestic entrepreneurial activity can increase sharply. For example, the strong demand for personal computers in the last three decades before the Millennium increased the demand

for chips and different hardware for the PC, thereby increasing the demand for entrepreneurial activity in Taiwan and Korea. As witnessed in the last few years, the building of under ocean fiber-optic cables opened up numerous opportunities in India.

Domestic institutional settings can curtail potentially strong demands for entrepreneurial activity as well as help them to blossom. Burdensome taxes, bureaucratic regulations, unfair laws protecting one type of firm against another, and unnecessary red-tape all help to choke off and discourage potential demand. For example, some believe that the Japanese economic recovery was delayed by an inefficient distribution system and by its unwillingness to come to grips with bad bank loans for the last twenty years. On the other hand, establishing friendly offices to help new entrants, creating accommodating settings for foreign firms, creating clear and fair laws, and minimizing institutional constraints can all bring demand for entrepreneurial activity to the forefront. For example, efforts by Ireland to promote foreign direct investments from the U.S. computer and financial industries helped turn around its economy to become the Emerald Tiger.

By promoting more entrepreneurial activities in new inventions, new processes, and new products, the government can achieve more economic growth in two ways. One way is to establish new institutional settings that encourage workers to be more adventurous, inventive, and active in pursuing their dreams, thereby increasing the *aggregate supply* of entrepreneurial activities. A recent successful example occurred in China. The China Patent Administration was founded soon after the reform policy took place, and since 1980 the Chinese patent system developed rather quickly to protect intellectual property rights. To intensify the nation's competitiveness, the government also has made enduring efforts to join international organizations.[14] While China ranked

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[14] China joined the World Intellectual Property Organization (WIPO) in March 1980. The first Chinese patent law was passed in March 1984 and became effective on 1 April 1985. China joined the Patent Cooperation Treaty (PCT) in 1994, indicating that China's IP rights legislation was consistent with international standards. China became a member of the World Trade Organization (WTO) in 2002 and pledged to follow the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) while promoting the development of its own IP rights protection system. In 1998, the China Patent Administration was renamed as the State Intellectual Property Office (SIPO). See Chapter 17, IP Handbook, provided by www.iphandbook.org.

fifth in the world for the number of patent applications filed in 2006, Chinese patents of invention granted by the U.S. Patent and Trademark Office has increased more than 14 fold, from 46 patents in 1996 to 661 patents in 2006.[15]

Another way to promote entrepreneurial activities is to ease regulations and barriers and to encourage more *aggregate demand* for entrepreneurial activities, from both domestic and foreign markets. In the U.S., the Office of Advocacy of the U.S. Small Business Administration (SBA), created by Congress in 1976, is an independent voice for small business within the federal government. Through training, government agencies have paid closer attention to their obligations under the Regulatory Flexibility Act (RFA).[16] The Office of Advocacy estimates cost-savings totaling over $50 billion since 2001.[17] Cost saving and other government acts reducing business burden definitely have a positive impact on entrepreneurial activities. On the international front, using a set of survey data from 32 nations, in 2007 Global Entrepreneurship Monitor reports that high-growth entrepreneurship is highly associated with many domestic policy conditions including ease of obtaining permits and licenses, fiscal burden, and consistency and predictability of regulatory control.[18]

To reiterate the importance of increases in aggregate supply of and aggregate demand for entrepreneurial activity, we analyze these two possibilities with the help of diagrams.

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[15] US Patent and Trademark Office report, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/index.html.
[16] The Regulatory Flexibility Act (5 U.S.C. 601-612) requires federal agencies to consider the effects of their regulatory actions on small businesses and other small entities and to minimize any undue disproportionate burden.
[17] Some agencies submit their draft regulations to Advocacy early in the process to obtain feedback on their RFA compliance and small business impact. Early intervention by the Office of Advocacy and improved agency compliance with the RFA have led to less burdensome regulations. A detailed listing of cost savings can be found in the Office of Advocacy's annual reports on the Regulatory Flexibility Act http://www.sba.gov/advo/laws/flex.
[18] Global Entrepreneurship Monitor: *2007 Global Report on High-Growth Entrepreneurship*, by Erkko Autio, Babson College, London Business School, and Global Entrepreneurship Research Consortium. http://cspot01.babson.edu/ESHIP/research-publications/upload/GEM_High_Growth_Report_07b.

Promoting more entrepreneurial activities through increase in supply

      Market equilibrium for entrepreneurial activities is determined when the aggregate supply is balanced by the aggregate demand. In *Figure 5A*, the initial market equilibrium is point (*E*, *r*). Assume that the government starts a campaign to encourage more entrepreneurial activity and that the aggregate supply increases from S_β to $S_{\beta+}$. The amount of entrepreneurial activities goes up to *E'*, while the return to entrepreneurial activity decreases to *r'*. The greater amount of entrepreneurial work provided in the economy leads to more economic growth.
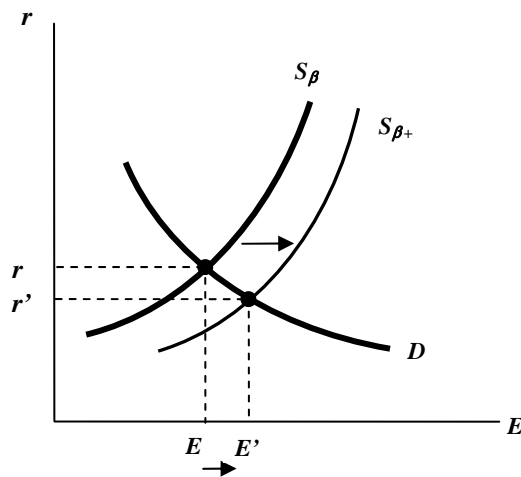
Fig 5A. **When aggregate supply is induced to increase from S_β to $S_{\beta+}$, entrepreneurial activities increase from E to E'.**
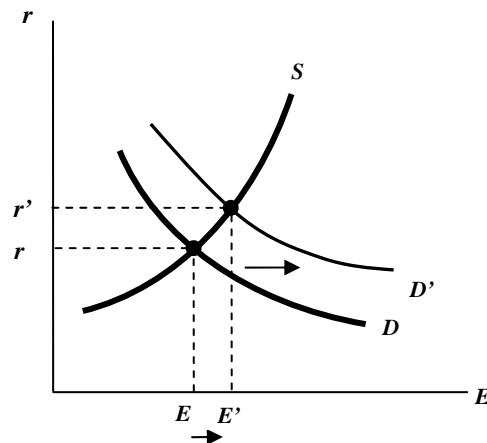
Fig 5B. **When the aggregate demand increases from D to D', the entrepreneurial activities increase from E to E'.**

Promoting more entrepreneurial activities through increase in demand

      If the government encourages open trade, foreign direct investment, and the influx of multinational corporations, an exogenous increase in the aggregate demand for entrepreneurial activity may occur. For example, if the global economy is doing well, stronger demand from foreign sources can greatly boost aggregate demand for entrepreneurial activity. This represents an exogenous increase in aggregate demand for entrepreneurial activity. The increase in aggregate demand leads to more entrepreneurial

activities and a higher return to entrepreneurial work. In *Figure 5B*, when demand increases from *D* to *D'*, equilibrium entrepreneurial activities increase from *E* to *E'* and the equilibrium return to entrepreneurial work rises from *r* to *r'*. Naturally, if the government promotes increases in both the aggregate supply of and the aggregate demand for entrepreneurial activity, the combined forces lead to an even bigger increase in the equilibrium quantity of entrepreneurial activities.

6. *Policy Issues and Conclusion*

The literature contains much discussion on policy and entrepreneurship. Baumol (1993) identifies the role of entrepreneurship in economic growth, pointing out that not only are entrepreneurs an allocated resource, they themselves also allocate resources.[19] Policymakers must be entrepreneurial as resource allocators so that entrepreneurs as allocated resources are guided in a productive, rather than unproductive or destructive, direction.[20] Our model supports the general theme by concentrating on the impact of an increase in the aggregate supply of and aggregate demand for entrepreneurial activity. In order to effectively encourage productive entrepreneurial activities, policy must help to push aggregate supply upward while finding ways and means to promote pent-up demand for entrepreneurial activity.

The world has never seen as much invention and technological advances as in the last few decades. New products and never-before-imagined products have become necessities over a few short years. In the industrialized world and even parts of the developing world, who could now imagine living without photocopying machines, PCs, fax machines, ATMs, cellular phones, DVDs, or even iPods and iPhones for many youngsters?[21] With leaps and bounds in different technologies, opportunities may spring up everywhere. With ingenuity, many a millionaire/billionaire is born through

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[19] This view has been very convincing to explain how capitalistic growth has happened and lasted for so long. See Baumol (1993), p 19-20.

[20] Chapter 12 in Baumol (1993).

[21] It shocked one of the authors to hear her 7 year old niece say over Christmas that she wanted a notebook computer and an i-pod.

entrepreneurial endeavors and more opportunities are around the corner.[22] With unlimited technological avenues and strong demand potential, it has become ever so important for governments of the industrialized world as well as developing nations to promote more entrepreneurial effort from their own citizens.

With the steady decrease in transportation and information costs and rapid increase in technology, the world economy has become more globalized. Firms in one country compete with firms in other countries all over the world. Isolation and insulation mean that one cannot keep up with current technologies, and production processes easily become antiquated. Companies in industrialized and newly industrialized nations become ever more competitive, as cheaper and more innovative means of production are introduced and more alternatives to their products become available. To stay competitive, most firms need to cut costs and find more efficient means of production, generating demands for newer, better, and often cheaper services and goods. If the government provides a setting accommodating to foreign firms, it opens up numerous possibilities and generates demands for new entrepreneurial activity. This is especially important for governments in the developing nations.

Given that governmental policies can influence individual supply and aggregate supply of entrepreneurial activity, further research should examine different mechanisms that governments can adopt to influence people's behavior. Some mechanisms may have more direct and stronger impacts on supply behavior. Different individuals may respond differently to a specific policy. For example, should a developing country with limited resources spend more to educate its poor or to improve the skills of the relatively better educated? Should it promote the excitement of entrepreneurship all over the country when people in landlocked areas lack adequate means of transportation to trade with the rest of the country or the world? Likewise, different means to promote aggregate demand for entrepreneurial activity should be studied further. For example, should a country pour its resources into developing a few friendly economic zones to jump-start its economy, or

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[22] Old timers include Microsoft founder Bill Gates, Apples founder Steven Jobs, Amazon.com founder Jeff Bezos, America Online co-founder Steve Case, and eBay founder Pierre Omidyar. New comers include Google founders Sergey Brin and Larry Page and YouTube co-founders Chad Hurley and Steve Chen.

should it invest in more infrastructures throughout the country to bring demand more evenly to all its cities? Further, our model should be extended to study behavior of productive versus non-productive entrepreneurial activities. The study can help form policies that can restrain non-productive and encourage productive entrepreneurial activities.

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