

TOWARD A THEORY OF ENTREPRENEURSHIP

by

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A thesis submitted to the faculty of  
The University of Utah  
in partial fulfillment of the requirements for the degree of

Master of Arts

Department of Economics

The University of Utah

December 2011

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**The University of Utah Graduate School**

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## ABSTRACT

While current economic models acknowledge the important role entrepreneurship plays both as a factor of production, and as a force behind long-term growth, a formal definition and theory is absent. This thesis reviews the current literature on entrepreneurship to create a working definition. This definition is used to develop the beginnings of a theory of entrepreneurship with special emphasis placed on its relationship to the real business cycle. A select data set and case study are presented, followed by a brief discussion of the consequences of the model and its implications for government policy, as well as a call for additional data collection related to entrepreneurship.

Per la mia famiglia: Nicole, Luciano e Giovanni.

Sempre Avanti.

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## ACKNOWLEDGEMENTS

This dissertation is the culmination of years of education, all of which were made possible by my parents: Margaret Jean Wheatley and Nello-John Pesci. Their active role in my life-long education, whether through the introduction to new ideas or simply proof-reading my many papers, has been invaluable and has allowed me the creative freedom to work on the theory laid out in this thesis. Special acknowledgement also goes to Gregori Pesci who first introduced me to all things entrepreneurial. His guidance, support and hard work ethic have been a model for me to follow and his hand guided much of the initial research that led to this thesis. I would like to also acknowledge Dr. Lindsey Adams, who directed my undergraduate program and taught me how to find answers to many of my current problems in historical examples. Next, I would like to acknowledge my committee members for their suggestions and support, especially Dr. Richard Fowles who has mentored my progress from the first day I began the MA program. Finally, I would like to acknowledge the University of Utah, its incredible faculty and especially the Honors College, where I learned many of the critical thinking skills I use daily in my academic and personal life.

## 1. INTRODUCTION

Entrepreneurship has been a principal component of economic theory since Cantillon's posthumous publication *Essai sur la nature du commerce en général*. Yet despite its early appearance in the literature it has been given far less treatment than other factors of production, and still has no exhaustive theory to call its own. This is evident in the various definitions of entrepreneurship, as well as its superficial treatment in most economic texts. An understandable reason for its tacit presence is the difficult nature of quantifying entrepreneurship, which is by nature dynamic, using the traditional static modeling of current economic theory (Baumol, 2010).

Yet entrepreneurs are the risk-takers of society who drive innovation, which is increasingly recognized as a major force behind long-term growth.<sup>1</sup> This paper examines a selection of available scholarly works on entrepreneurship in order to

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<sup>1</sup> The extensive work of the Kauffman Foundation has done much to demonstrate the impact entrepreneurs have on the modern economy. Readers who are unfamiliar with the Kauffman Foundation are encouraged to visit their website at <http://www.kauffman.org> or for an earlier treatment see the many works of Joseph A. Schumpeter.



define entrepreneurship. This definition is then used to develop a theory of entrepreneurship as it relates to the Real Business Cycle with a particular focus on recessions, and is tested against a data set and case study. Finally, a call for further modeling and econometric analysis is presented, along with a brief discussion of the potentially relevant role of government.

## 2. DEFINING ENTREPRENEURSHIP

Entrepreneurship has evaded formal definition in the current literature. The Webster online dictionary defines an entrepreneur as “one who organizes, manages, and assumes the risks of a business or enterprise”<sup>2</sup> while Gentry and Hubbard relate that “the notion of an ‘entrepreneur’ ranges from inventors who create new products or even new industries to local business people starting restaurants and retail stores” (Gentry & Hubbard, 2004). Each of these definitions is distinct, though each hints at the main difference between an entrepreneur and a simple business owner: the willingness to take considerable risks in order to innovate rather than replicate.

For the purposes of this paper the Kauffman Foundation, the current leader on all things entrepreneurial, presents us with a working definition of entrepreneurship:

We consider individuals to be engaged in enterprising activities if they devote their own independent efforts to the acquisition of wealth, power and prestige. They do not do so as employees of others, and, in the entrepreneurial process, they display initiative to a considerable degree. It

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<sup>2</sup> <http://www.merriam-webster.com/dictionary/entrepreneur>

seems clear that two primary avenues have been followed in this undertaking, which we label, for convenience, *redistributive entrepreneurship* and *productive entrepreneurship*. (Landes, Mokyr & Baumol, 2010, p. x)

According to William J. Baumol, who penned the above definition, while *redistributive entrepreneurship* can be both sanctioned and unsanctioned, either form is predatory and does not contribute to the net growth of the economy (Landes et al., 2010). This is in stark contrast to *productive entrepreneurship*, which is innovative and thus contributes positively towards economic growth (Landes et al., 2010). Yet even within *productive entrepreneurship* there is another distinction: those who innovate, and those who replicate. An entrepreneur differs from a business-owner/manager since the former creates something new, while the latter simply replicates what has already been done, even if they are highly successful in the process (Landes et al., 2010).

It is this “productively innovative” entrepreneurship that deserves a formal model, yet even Baumol’s recent book *The Microtheory of Innovative Entrepreneurship (2010)* is far from an exhaustive treatment of the motivations and consequences of entrepreneurial activity. What then can explain the lack of an entrepreneurial theory? One potential source is that the very essence of entrepreneurship is innovation and the creation of something never previously known. Aggregating these activities in a quantifiable way becomes increasingly difficult, especially over a large time horizon with vastly differing technologies and means of measurement (Landes et al., p. xi).

This difficulty is realized when searching for usable data sources relating to entrepreneurial activity. The closest thing to an extensive data set is the Small

Business Administration's Statistics of U.S. Businesses, though it only provides data from 1997 onward and the information collected is so general that it offers little insight. This shortcoming is shared by U.S. Census Data, and particularly the U.S. Economic Census conducted every 5 years, each of which provides only broad details but nothing that could be used to distinguish between entrepreneurial ventures and typical business activity.

The next potential source is the Current Population Survey (CPS) conducted monthly by the Bureau of Labor Statistics. While it has the advantage of being collected for more than 50 years, it still does nothing to distinguish between entrepreneurial innovation and the monthly noise of the market. However, the CPS has been used to match data against the newly developed Kauffman Index of Entrepreneurial Activity (KIEA) (Fairlie, 2010). While the KIEA possesses the most potential as a future data source, its short time horizon limits its current usefulness especially for any detailed longitudinal analysis of entrepreneurship.

The Kauffman Foundation has attempted to circumvent this lack of existing data through a historical approach in *The Invention of Enterprise: Entrepreneurship From Ancient Mesopotamia to Modern Times*, authored by various economic historians and edited by David S. Landes, Joel Mokyr and William J. Baumol. When discussing the difficulty of distinguishing between entrepreneurship and general business activity they claim a historical approach is necessary because:

The foundation of statistical analysis of relationships is the availability of a sufficient number of homogeneous observations to ensure that any observed interrelationship in the behavior of two such sets has a very low probability of having been fortuitous. But for the behavior of the innovative entrepreneur on the matters here under discussion, such internally comparable data sets are not generally available. (Landes et al., 2010, p. xi)

Despite the current absence of “comparable data sets,” it is the purpose of this paper to lay the initial foundation for a comprehensive and quantifiable model of innovative entrepreneurship. Furthermore, it can be shown that current data lends itself to the process, and that through continued measurements such as the KIEA we will eventually be able to model entrepreneurship with traditional econometrics tools.

### 3. A MODEL OF ENTREPRENEURSHIP

In order to utilize econometric methods we first need a model of entrepreneurship that examines key independent variables of interest based on theoretical guidance. Using the definition above we will restrict our model to theoretically “potential” entrepreneurs, defined as those who have sold their labor to an employer at or above their current reservation wage. We will then introduce changes in key macroeconomic variables to elicit potential responses. These key variables will include price, wage, the interest rate, unemployment, personal savings, and the expected rate of return on other investments. All of these variables will be examined in the context of the Real Business Cycle with a particular emphasis on recessionary periods.

### 3.1 The Role of Price and Wages

According to the traditional IS-LM model, price is set according to the costs a firm anticipates it will incur using factors of production plus some markup:

$$\rho = F(L, N, K, \mu)$$

where  $\rho$  is price,  $L$  is land,  $N$  is labor,  $K$  is capital and  $\mu$  is the markup

Assuming a certain level of competitive pricing power, i.e., the firm has some price-setting ability, the markup power ( $\mu$ ) is positive. This has been the traditional means of explaining the wage-setting relationship (Blanchard, 2009). According to this model, if we assume that price is the current real price and not an expectation of future price, and if we reserve our analysis only to the use of labor as a factor of production while holding land and capital fixed, the wage setting relationship becomes:<sup>3</sup>

$$\frac{\rho}{\omega} = 1 + \mu \quad \text{or} \quad \frac{\omega}{\rho} = \frac{1}{1 + \mu}$$

where  $\rho$  is real current price,  $\omega$  is the market wage and  $\mu$  is the markup

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<sup>3</sup> The derivation of the wage-setting/price-setting equations is well known in economics. As a result their intermediate steps have been suppressed for brevity. Any reader unfamiliar with these equations is directed to Olive Blanchard's *Macroeconomics* 5<sup>th</sup> Edition (2009) for a set-by-step derivation.

If we assume that the firm has little ability to manipulate the markup ( $\mu$ ) in the short-run, any change in the real price ( $p$ ) must be offset by a change in wage to hold the relationship constant. This is particularly important to our model of entrepreneurship, since changes in price will have the greatest effect on those with the highest reservation wages, defined to be the minimum wage an employee will accept before choosing to seek other employment or even unemployment (Burdett & Vishwanath, 1988; Hofler & Murphy 1991; Kiefer & Neumann, 1979).

At any given moment a firm may employ any number of employees, and each of these employees will have a unique reservation wage. The work of Hofler and Murphy (1991) has estimated that the average market wage is 25% higher than the individual worker's reservation wage. Finally, the work of Kiefer and Neumann (1979) has shown that reservation wages are not constant over time, but vary with the length of potential job searching activity.

With these details in place we are ready to theorize on the response of an innovative entrepreneur working within an existing firm at the time of a price change. Given a price increase related to inflationary pressures, to hold the markup constant the firm must increase wages. If instead they seek to keep the excess profits in the short-run by increasing the markup and holding wages constant, they will lose employees to other firms and industries as workers experience the inflationary erosion of their real wage. Inevitably the firm will have to increase wages to match inflation and the markup will return to its previous level or face an exodus of labor.



Conversely, if prices fall due to recessionary pressures, in order to keep a constant markup the firm must cut the market wage ( $\omega$ ) which they offer. Given Hofler and Murphy's (1994) finding this may not cause large changes in the overall labor composition of the firm. However, their analysis is based on an "average worker" and what makes an entrepreneur distinct is his ability to innovate and create, which is quite different than "average." Furthermore, within any distribution of wages there are highly capable employees who have correspondingly high reservation wages, since these are a reflection of their self-perceived value, and it is these individuals who are most likely to be innovative entrepreneurs. Thus an innovative entrepreneur who is well aware of his own value may be motivated to leave the firm given any size wage cut, especially if the expected rate of return on innovation is higher than the cut in the market wage. As we will see in the next section, entrepreneurs are also less risk averse and thus may have a biased expectation regarding the rate of return and high-risk financial activities (Gurley-Calvez, 2010).

Two final notes are in order regarding the reservation wage. First it is shaped by other forces, the most important of which is the level of unemployment. Unemployment is negatively related to the market wage in traditional macroeconomic analysis, so that high levels of unemployment lead to lower market wages (Blanchard, 2009). This will also affect the entrepreneur's decision to leave, since he knows he will be entering a larger pool of applicants for fewer available jobs. However, the primary assumption of this model is that the choice for the entrepreneur is between current employment and his own venture, so that the level

of unemployment should have a minimal effect given that he is leaving the labor pool to become a business owner. In fact, unemployment may motivate entrepreneurial venture since labor, as a factor of production that the entrepreneur must utilize, is abundantly available at momentarily low market wages due to the recessionary fall in prices.

Second, the reservation wage has been shown to decrease with the amount of time spent unemployed (Kiefer & Neumann, 1991). This has interesting consequences on any theory of entrepreneurship, since it places a time-related penalty on the entrepreneur for leaving a firm. If two entrepreneurs with equal reservation wages each leave their respective firms the one with the better “innovation” and thus the better chance of attracting investors and factors of production is likely to survive the period of unemployment, while the other will find his declining reservation wage driving him back towards fulltime employment. This may provide a check on speculation, and functions as another market mechanism directing the use of resources to the most efficient and highly valued acts of production.

### 3.2 The Role Of Wealth, Personal Savings, and Investment

Once an entrepreneur has been driven back into the market following a cut in the market wage, he has a finite amount of time to attract factors of production to his venture before accepting another job at an existing firm (Kiefer & Neumann, 1991). In order to attract all the necessary factors of production, the entrepreneur

needs capital. One source of such funding is personal wealth and/or personal savings. Another is investment capital from the market. An interesting component of wealth and personal savings relates to the previous section on reservation wages, since it has been shown that wealth has a significant positive effect on the reservation wage and thus a negative effect on the likelihood to accept other employment (Bloemen & Stancanelli, 2001). First we will turn to the role of wealth and personal savings.

According to Gentry and Hubbard (2004), “entrepreneurial households own a substantial share of household wealth and income” and “the savings patterns of entrepreneurs appear to be quite different than those of nonentrepreneurial households” (p. 2). Furthermore, “wealth-income ratios are higher for entrepreneurial households and saving-income ratios are higher for entrants and continuing entrepreneurs, even after controlling for age and other demographic variables” (Gentry & Hubbard, 2004, p. 2). What is clear is that entrepreneurs are more likely to have access to start-up capital, which may help them avoid reentry into the traditional firm labor force.

Gentry and Hubbard (2004) have also shown that entrepreneurial households hold most of their investment within their own business, and do not diversify. This trend is even more apparent over time since “entrepreneurs grow less diversified over time suggesting that the lack of diversification is not just related to possible down-payment constraints for starting a business” (p. 2). This may be seen as further evidence of their self-perceived value, since they do not expect a rate of return on any other investment to be capable of matching their own.

Yet, Gentry and Hubbard's analysis looked exclusively at existing entrepreneurs, which says little about those who have recently left a firm in response to a market wage cut. However, the work of Tami Gurley-Calvez (2010) has shown that entrepreneurs are more likely to have a safety net from friends and family and could readily borrow up to \$3,000. Similarly, a recent survey of entrepreneurs conducted by the Kauffman Foundation indicated that the founders' personal savings accounted for 70% of the initial funding while 16% indicated that the funds came from friends and family (Wadhwa, Aggarwal, Holly & Salkever, 2009).

Similar patterns are seen in investment choices on the part of entrepreneurs who are more likely to shop for the best investment or borrowing terms and are more conservative when deciding to borrow (Gurley-Calvez, 2010). Furthermore, entrepreneurs are more willing to take risks to achieve financial gains, and are twice as likely to take substantial financial risks to earn substantial returns (Gurley-Calvez, 2010), which may be seen as part of an overall pattern in their assessment of self-worth and capabilities. Contrarily, the Kauffman Foundation found that only 11% of those entrepreneurs surveyed indicated that venture capital investment played an important role during the startup period, only 9% indicated that angel financing was used, and only 7% used corporate financing (Wadhwa et al., 2009).

Given the disproportionate emphasis placed on the use of personal funds to start an entrepreneurial venture, we may reserve the remainder of this section to the role of interest rates on personal savings after making one note: During a boom, stocks and bonds may be a more attractive investment for the entrepreneur's personal wealth and savings, but during a recession this is reversed. What about the

role of the interest rate? During a boom the rate of return on a savings account or investment, combined with steady employment at above the reservation wage, may diminish the entrepreneurial “spirit.” However, during a recession all forces point towards entrepreneurial activity.

As interest rates fall, either because of a fall in prices or an increase in the nominal money supply, the expected rate of return on personal savings also falls. Similarly, it becomes cheaper to borrow capital from the market, should there be a lack of personal savings, unless severe deflation causes a high real interest rate in which case borrowing will be muted. Furthermore, the expected rate of return on stocks and bonds may be unattractive given the market condition or if there are inflationary expectations following a stimulus or other government interventionism.

All these forces contribute positively to entrepreneurial venture during a time of recession, since it lowers the relative costs associated with it (i.e., the loss of market wages, the return on savings and the return on other investments). Thus, like a cut in market wages, a recessionary contraction appears to motivate entrepreneurial venture rather than diminish it. This may be behind the recent findings of the Kauffman Foundation’s 2010 annual report which demonstrated that entrepreneurial activity, as measured by the KIEA, reached the highest level in 14 years in 2009—right in the midst of the Great Recession (Fairlie, 2010).

### 3.3 Testing the Model: The 2010 Fortune 500 Case Study<sup>4</sup>

With an explanation of the role of price, wages, unemployment, the interest rate, savings, and investments as well as their respective impact on entrepreneurship, we are ready to test the theory against data. This section includes preliminary analysis on the relationship between the founding dates of those firms on the 2010 Fortune 500 list and whether that year was recessionary. The assumption of this case study is that the companies on the Fortune 500 list are largely innovators who have stood up to many years and various market conditions. While this is a simplification of the characteristics of the businesses listed, it provides an initial look at the predicted role of recessions and the model built in the pages above: that recessions drive innovative entrepreneurs into the market where they create new firms, and even new industries. Furthermore, those who have weathered the test of time are also assumed to be prime examples of the entrepreneurial spirit mentioned previously, though there is no way to tell from the data whether this was a result of *productive* or *redistributive entrepreneurship*.

To build the data set, founding dates for all 500 listed companies were compiled from publicly available sources. This list was then ordered chronologically with the earliest foundation date being 1784 (The Bank of New York Mellon Corp) and the most recent being 2008 (Dr. Pepper Snapple Group). An immediate issue of note is the treatment of changes of operating titles, mergers and demergers. For the purposes of this data set, each firm listed on the 2010 Fortune

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<sup>4</sup> This test was devised by Gregori Pesci. This author would like to thank him extensively for both the initial idea, and for his arduous work collecting information on the founding dates for all the companies on the 2010 Fortune 500 list.

500 list was treated as a unique firm, which limits its inference to the general theory above. However, mergers and demergers do not represent a major source of the data.<sup>5</sup>

Two sources were referenced to create a dummy variable for recessionary and nonrecessionary periods dating back to 1784. For the period from 1784-1929 the work of Moore and Zarmowitz (1986) was utilized. For the period from 1930-2009 data was derived from the U.S. Department of Commerce, Bureau of Economic Analysis' *Contribution to Percent Change in Real GDP* was utilized (2010). To avoid issues related to the use of different deflators, years were simply treated as recessionary=1 or nonrecessionary=0. Further, for years where quarterly data was available, the year was treated as recessionary if 2 or more quarters experienced negative growth. Finally, categories were created according to year and the number of firms founded per year were counted and placed in the appropriate category.

*Figure 3* summarizes this variable: the minimum value is 0 and the maximum is 12 (which occurred in 1984). It has a mean of 2.212 and a standard deviation of 2.5732.

| Variable     | Obs        | Mean            | Std. Dev.     | Min      | Max       |
|--------------|------------|-----------------|---------------|----------|-----------|
| fortune500-s | <b>226</b> | <b>2.212389</b> | <b>2.5732</b> | <b>0</b> | <b>12</b> |

*Figure 3. Variable fortune500-s Summary Statistics*

<sup>5</sup> The details of the list limit the author's ability to specify the exact number of firms that resulted from mergers or demergers. However, an overly conservative approximation stands at less than 10%.

Figure 4 shows the results of a simple linear regression examining the relationship between the number of firms founded by year regressed on whether that year was recessionary (=1) or not (=0). In this regression model the constant (*\_cons*) is important, since it is the number of firms founded in nonrecessionary years (when *realrecess-n* is equal to zero). Thus, a value of *\_cons*=2.517 states that given the Fortune 500 data, we would expect approximately 2.5 Fortune 500 firms to be founded in a nonrecessionary year. Note that the constant is significant even with an alpha level of  $\alpha=0.001$ .

Next we examine the independent variable *realrecess-n* which is a dummy variable as previously described with a value equal to one for recessionary years and zero otherwise. Note as well that this variable is significant at the  $\alpha=0.05$  level, and almost significant at the  $\alpha=0.01$  level. Finally, the F value on the model, which explains the joint significance, is 5.80 and is significant at the  $\alpha=0.05$  and almost

| Source       | SS         | df        | MS         | Number of obs = 226 |                      |           |
|--------------|------------|-----------|------------|---------------------|----------------------|-----------|
| Model        | 37.5984132 | 1         | 37.5984132 | F( 1, 224) =        | 5.80                 |           |
| Residual     | 1452.2069  | 224       | 6.4830665  | Prob > F =          | 0.0168               |           |
| Total        | 1489.80531 | 225       | 6.62135693 | R-squared =         | 0.0252               |           |
|              |            |           |            | Adj R-squared =     | 0.0209               |           |
|              |            |           |            | Root MSE =          | 2.5462               |           |
| fortune500~s | Coef.      | Std. Err. | t          | P> t                | [95% Conf. Interval] |           |
| realrecess-n | -.8505747  | .3531978  | -2.41      | 0.017               | -1.54659             | -.1545593 |
| _cons        | 2.517241   | .2114493  | 11.90      | 0.000               | 2.100557             | 2.933926  |

*Figure 4. Simple Linear Regression Output*



significant at the  $\alpha=0.01$  level, though the *adjusted R-squared* is very low, which is to be expected in such a simplistic regression as this.

How do we explain that during a recessionary period we can still expect over 1.5 Fortune 500 level firms to be founded, and that the difference between recessionary and nonrecessionary periods is less than a single additional Fortune 500 firm? The model given in previous sections goes to the heart of this; there are strong motivations during a recessionary period to leave firm employment to pursue entrepreneurial innovation. In fact, of the 500 firms listed on the 2010 Fortune 500 list, 135 (27%) were started during recessionary years. These findings are supported by the Kauffman Foundation's analysis of the 2009 Fortune 500 list in which more than half of the firms were founded during a recessionary year, and the 2009 Inc. 500 list in which just under half were founded in recessionary periods (Stangler, 2009). Hyatt Corp., Burger King Corp., Lexus Nexus, FedEx Corp., Microsoft Corp., CNN, MTV and Wikipedia were all started during a recessionary year, to name a few (Caron, 2008).

While this case study has dealt with data related to large firms, many of which started in bad times, they were all originally startups. For this reason we may treat the findings of the above regression as encouraging, though hardly complete, in regard to the model proposed in this paper. Yet this is to be expected given the current lack of a uniform definition of entrepreneurship, to say nothing of a model and its associated variables. What this case study has shown is that there is a

relationship, which motivates further testing and analysis, as well as some clarity on where to begin collecting data, and on what key variables.

#### 4. LOOKING AHEAD: WHY IT IS IMPORTANT AND WHERE WE NEED TO GO

As the above model and case study have shown, there are relationships yet to be fully understood between entrepreneurship and the business cycle. Often in economics the full importance of a theory is not appreciated until after the theory has been formalized, and this is certainly the case with entrepreneurship. A glimpse of the potential importance of the above model has been explained in various publications from the Kauffman Foundation, the most important of which will be summarized in the remaining pages of this paper.

The first point to be discussed relates to the impact an innovative entrepreneur can have on economic growth. According to estimates by Robert E. Litan (2010) of the Kauffman Foundation, as few as 30 innovative companies whose revenues exceed \$1 billion annually could increase U.S. GDP by 1 percentage point per year. According to Litan:

The firms to which I specifically refer are those truly innovative or inventive enterprises that bring to the market something new—a product, service or process—that generates substantially more benefits for society as a whole than any single entrepreneur, inventor, or firm can capture alone. Think, for

example, of General Electric and the electric light, which literally opened up new horizons for all humanity to work and experience new forms of leisure when it is dark outside. (p. 3-4)

Additional research from Dane Stangler (2010), also of Kauffman, has shown that within any given year roughly 10% of all U.S. job growth is the result of fast-growing young firms, who comprise only 1% of all companies in the U.S. This is supported by Business Dynamic Statistics (BDS) data that show on average new firms add 3 million jobs to the economy in their first year (Kane, 2010).

Finally, according to a joint analysis by the U.S. Census Bureau and the Kauffman Foundation, “startups and young firms (those less than five years old) account for nearly all net job creation in the United States. Indeed, the importance of these companies in creating new jobs now appears to be well-recognized in national discussion of economic policy” (Stangler & Kedrosky, 2010, p. 4). This trend has also been demonstrated at the state level, with those states having the highest entrepreneurial activity, as measured through the BDS and the Kauffman Foundation, also having the highest average net employment growth (Haltiwanger, Jarmin & Miranda, 2009).

With such relative importance to economic growth and job creation, the necessity of collecting and analyzing entrepreneurial data to get accurate estimates of parameter coefficients cannot be overstated. For this reason, it is important to utilize the model developed above to formulate empirical tests of the relationships between variables like price, unemployment, etc. and the level of entrepreneurial activity at both the State and Federal levels. While the Kauffman Index of Entrepreneurial Activity (KIEA) is a good start, more detailed questions should be

built into existing surveys the like the BDS and CPS. Once data on these variables have been collected, it will open the way for extensive analysis and creative hypothesizing: All that is lacking at the moment is the data.

With this information policy makers will be better prepared to examine the costs and benefits of any particular policy initiative. The traditional divide between monetary policy and fiscal policy may eventually need to include an entrepreneurial policy that aims at promoting innovation within the market. According to Baumol (2010):

Government, in particular, plays two critical roles—one active and the other passive—in the innovation story. The passive contribution is provided primarily through the legal infrastructure and includes well recognized provisions that guarantee property rights and enforceability of contracts, as well as access to patented intellectual property, the lack of government interference in the exchange of technical information, and the absence of employment and rental rules that inhibit the formation of new firms. Such legal protections encourage entrepreneurship, the formation of new firms, and investment in the innovation process by larger competing enterprises. On the active side, the government’s financial support of basic research has proven invaluable. Such research, with its uncertainties and unpredictable benefits, is not highly attractive to private enterprise, despite its critical role in long-term innovation and growth. (p. 34)

However, the major obstacle government will encounter relates back to the formal definition of entrepreneurship given above: how to distinguish between *productive* and *redistributive* entrepreneurship should it choose to take an active role.

How will State and Federal agencies distinguish between speculation and innovation, for example? Currently, it appears that recessionary forces have been filtering out those who can survive and those who fail, and it seems a major obstacle to overcome should an activist policy be pursued. Yet once again, data may be the answer. Do entrepreneurs share demographic and psychographic characteristics

that can be used to predict the risk associated with investing in the entrepreneur rather than the innovation? In the absence of empirical data we can only theorize, but it seems a worthwhile mental experiment given the gains to be made through innovation.

## 5. CONCLUSION

The current lack of data is a major obstacle in formalizing a model of entrepreneurship. However, one of the first steps in any research process is the formal definition of a model to be subjected to rigorous testing. The model presented above is one such example. Given the importance of entrepreneurial innovation on growth and jobs, it is a worthwhile endeavor. Refinements in current data collection pipelines could open an entirely new subdiscipline of microeconomics, thus completing the theoretical argument first laid out by Cantillon and later by Schumpeter. The case study presented above demonstrated a definitive relationship between firm creation and recessions, based on the theoretical constraints of the model of this paper.

A secondary consequence of this model is that it forces us to reevaluate our perceptions of recessions, since it may provide a glimmer of hope in the form of counter-cyclical entrepreneurship, despite the short-term hardship. Currently, recessions are seen as temporary stalls in an otherwise upward procession in growth, yet it may be that a large portion of eventual growth has its genesis in

recessionary periods, which implies a tradeoff between long-term growth via innovation and short-term stability through Business Cycle smoothing. All of these forces may be seen in the following article:

Stephanie Rosales lost her job as a school psychologist last spring. A day later, her husband Jorge lost his teaching job. Undaunted, the Indio couple, who have a 6-year-old and a 3-year-old, launched a business they'd been contemplating for years. "We opened up a bottle of wine and said, 'Let's go for it!'" Stephanie said with a laugh. "They could take our jobs away, but not our determination to succeed." (Perrault, 2011, np)

It is individuals like Stephanie and Jorge Rosales who are worthy of a comprehensive model of entrepreneurship, since they may be the entrepreneurs behind our next great innovation.



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