

Volume 6, Number 2

ISSN 1087-9595

# ACADEMY OF ENTREPRENEURSHIP JOURNAL

An official Journal of the  
Academy of Entrepreneurship

**Editor: Thomas M. Box**  
*Pittsburg State University*

**Assistant Editor: Beth M. Crocker**  
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Academy Information  
is published on the Allied Academies web page  
[www.alliedacademies.org](http://www.alliedacademies.org)

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The *Academy of Entrepreneurship Journal* is published by the Allied Academies, PO Box 2689, 145 Travis Road, Cullowhee, NC 28723, USA, (828) 293-9151, FAX (828) 293-9407. Those interested in subscribing to the *Journal*, advertising in the *Journal*, or otherwise communicating with the *Journal*, should contact the Publishers at the above address.

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## LETTER FROM THE EDITOR

We are extremely pleased to present Volume 6, Number 2, of the *AEJ*. The Academy of Entrepreneurship is an affiliate of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The *AEJ* is a principal vehicle for achieving the objectives of the organization. The editorial mission of this journal is to advance the knowledge, understanding, and teaching of entrepreneurship throughout the world. To that end, the journal publishes high quality, theoretical and empirical manuscripts, which advance the entrepreneurship discipline.

The manuscripts contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

As editors, we intend to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. We welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

The Editorial Policy, background and history of the organization, officer lists and addresses and calls for conferences are published on our web site. In addition, we keep the web site updated with the latest activities of the organization. Please visit our site and know that we welcome hearing from you at any time. Please feel free to contact me with journal submissions at the address below.

The manuscripts in this edition of the journal have as their foci: international entrepreneurship and female entrepreneurship and/or gender differences. Studies with relevance to Italy, Hungary, Malawi, China and Hong Kong as well as Australia and the climate of entrepreneurship are explicated in the first series of articles.

The second series of articles focus on gender differences with particular attention to female and minority-owned businesses. Finance and sales forecasts are also examined with regard to small firms.

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# UNCERTAINTY AND NEW VENTURE INVESTMENTS: SOME EMPIRICAL EVIDENCE FROM YOUNG ITALIAN FIRMS

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## ABSTRACT

*The paper focuses on entrepreneurial decisions regarding initial investment during the creation of new ventures. It presents an empirical test on the relationship between the uncertainty perceived by entrepreneurs when starting new independent ventures and the relative size of start up investment. It also explores the relationship between the relative size of initial investment and the early growth of the firms.*

*The aim of the paper is to verify whether the relative size of initial investment is influenced by the uncertainty perceived by entrepreneurs at the time of start up. Some hypotheses are developed and tested on a sample of 124 new independent Italian firms. The hypotheses build on some contributions in the field of the real option perspective for investments, which stress the importance of the dimension and timing of investments and the role of waiting in increasing or decreasing the attractiveness of a project. Three different forms of uncertainty are identified: internal uncertainty, external uncertainty and resource uncertainty. Each form of uncertainty is supposed to have a different influence on the decisions about the investments. The paper also explores the relationship between asset relative size and firms' growth, the latter being considered as a major indicator of new venture performance.*

## INTRODUCTION

Many different perspectives can be used when studying new venture creation, that has been recognized as a multidimensional phenomenon (Gartner, 1985). One of these perspectives regards the accumulation of assets inside the firms. The consideration of the entrepreneur as a coordinator of resources originates in the work of Say (1840) and has been adopted by many other economists. Studies in the field of entrepreneurship have considered the acquisition of the resources needed to start the business to be a central step in the new venture creation process (Vesper, 1990; Bhava, 1994). In addition to this, the accumulation of assets has been identified as a property characterizing the emergence of an organization (Katz & Gartner, 1988).

Despite the consideration of the fundamental role that capital constraints and resource availability play in the process, there are still not so many studies that focus on the distinctive decisions regarding assets acquisition in new ventures. Most research focuses on the availability of initial human and financial resources in influencing the performance of the new ventures (Timmons, 1986; Cooper, Gimeno-Gascon & Woo, 1994; Carter, Williams & Reynolds, 1997) and on the actions undertaken by entrepreneurs in order to obtain capital for starting the firms (Birley, 1985; Dubini & Schillaci, 1988; Starr &

MacMillan, 1990; Vesper, 1990). However, research on habitual entrepreneurs (MacMillan, 1986; Colombo, 1988) and some recent contributions adopting a resource-based approach (McGrath, 1996) have pointed out how entrepreneurs can adopt different behaviour when dealing with start up investment and how such behaviour can be considered a way to cope with the perceived uncertainty.

In this paper we focus on the relative size of the initial investment, that represents one of the founders' decisions regarding the process of accumulating assets inside the new firm.

We identify two different behaviours that entrepreneurs can adopt for the initial investment: "large scale" and "asset parsimony". We then explore whether it is possible to identify a relationship between these behaviours and the uncertainty perceived by the entrepreneurs when starting the venture, and these behaviours and the growth of sales that the ventures are able to obtain in the first stages of their life.

### INITIAL INVESTMENT IN NEW FIRMS CREATION

According to the literature on new venture creation (MacMillan, 1986; Colombo, 1988; McGrath, 1996), two different investment behaviours can be adopted by entrepreneurs when dealing with the acquisition of assets: "large scale" and "asset parsimony". We will examine these two behaviours, focusing on the *relative size of the initial investment* that each behaviour involves - namely the amount of assets that the founders invest in the very initial phase compared with the initial sales.

The entrepreneurs deciding to invest on a "large scale" intend to create as soon as possible a firm of a dimension compatible with the efficient size in the industry. The underlying logic for this behaviour is the theoretical base of the traditional business plan techniques. According to this perspective, start up investment should be guided by the search for market effectiveness, by the previous identification of the set of assets necessary to constitute the organization and by the anticipated planning of the activities to be done. The entrepreneurial goal is the exploitation of a previously identified market opportunity. Founders investing on a "large scale" tend to build from the beginning an organization able to compete with the firms already present in that industry.

For these ventures, the relative size of the initial investment is quite large. The quantity and quality of the assets acquired is mainly influenced by the availability of capital, while in the first period the sales can be very low. Thus in some cases large scale investments lead to firms that are oversized for a certain period of time.

The large relative size of the initial investment can negatively impact on the profitability in the very initial period, if limited sales are compared to fixed costs generated by the size of the firm. On the other hand, if ventures are able to successfully address the target markets, they can more easily increase the production, thus obtaining a fast growth of sales.

Other entrepreneurs follow the principle of "asset parsimony", namely the skill of deploying minimum assets needed to achieve the desired business results (Hambrick & MacMillan, 1984). They postpone the acquisition of each single asset to the time it is really needed. In "asset parsimony" behaviour, the initial investment takes place through a gradual acquisition of all the assets over a certain period of time. Parsimonious entrepreneurs try to maximize from the very early phase of the firm's life the rate of returns on the investment. The cash flows generated are then used for step-by-step expansion of the organization. In this approach, assets are minimized in relation to the firm's output (MacMillan & Hambrick, 1988). "Asset parsimony" is often made possible by the commitment of the founders in obtaining all the resource needed at the lowest possible cost. Second-hand goods are bought and the entrepreneurs' personal network is used to obtain all the resources at the

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minimum possible cost. It has been pointed out that the extensive use of social capital (Starr & MacMillan, 1990) can allow new ventures to beg, borrow, or loan the assets needed.

### UNCERTAINTY AND INITIAL INVESTMENT

The new venture creation process takes place through a successive and interrelated sequence of actions and decisions. The decisions about initial investments are some of the various decisions that the founders have to take during the start up. Decision-making in new ventures is characterized by uncertainty. In older firms the availability of historical data, past results and a large number of internal and external information help to reduce the level of uncertainty at a low cost (Thompson, 1967). Entrepreneurs dealing with start up processes do not have all this information. In many cases they take decisions under conditions of scarcity of information. Moreover, the efforts to reduce the uncertainty through the acquisition of additional data could prove for them too expensive and not so effective. For taking the main decisions, entrepreneurs are very dependent on their feelings and perceptions.

Therefore in the study of entrepreneurial decision-making processes, it is useful to refer to contributions in the fields of decision-making under conditions of high uncertainty and of real option perspective for investments (Bowman & Hurry, 1993; Dixit & Pyndick, 1994; McGrath, 1997). These recent contributions in the field of investment decision-making under conditions of uncertainty have identified different forms of uncertainty (Dixit & Pyndick, 1994), each differently influencing decisions about the timing and the size of investment (McGrath, 1997). The application of these propositions to investments in new ventures has stressed that by adopting rational investment behaviours the entrepreneurs can systematically and idiosyncratically reduce uncertainty (McGrath, 1996). We refer to these three forms of uncertainty, taking into account the peculiarities of the new venture creation process.

With regard to investment decisions, it is possible to distinguish between internal, external and resource uncertainty. Internal uncertainty is a "technical uncertainty" (Dixit & Pyndick, 1994) and refers to the costs and probabilities of obtaining technical success with the project. This form of uncertainty is "internal" because it depends on factors and conditions that are inside the firm and in particular on its knowledge and skills. A decision-maker facing high internal uncertainty does not know if his or her organization will be able to successfully complete the project. In this case, because the uncertainty originates in the firm, there is no additional information that can be expected in order to reduce the uncertainty. In the presence of an interesting investment opportunity, if the main uncertainty that the decision-maker faces regards the ability of the organization in coping with that project, the rational decision should be to invest immediately, thus accelerating the timing of the investment. Under conditions of high internal uncertainty, waiting has no positive value, while it can affect the future profitability of the investment, as some favourable conditions can disappear. Therefore, internal uncertainty creates pressures to invest immediately (McGrath, 1997).

In the new venture creation process, internal uncertainty can be referred to the ability of the entrepreneurs to realize their business idea using their previous knowledge, competencies, experiences and skills. In order to successfully start the business, the entrepreneurial team must be able to solve the main technical issues, to define a marketing mix appropriate for the selected markets and to manage the assets and human resources in the emerging organization. Internal uncertainty in new ventures can be related to the founders' background - namely their past experience and knowledge. A strong background enhances the experience and the knowledge of the founders, thus reducing the perceived internal uncertainty. On the other hand, lack of a technical, commercial or managerial experience or knowledge is supposed to increase perceived internal

uncertainty. It has been pointed out that a rational way to cope with the internal uncertainty is to invest (McGrath, 1997) because only by investing will the entrepreneurs start to learn about the new venture, thus reducing uncertainty. So we expect to find initial investment of a large relative size in new ventures which face high internal uncertainty.

Hypothesis 1: Under conditions of high internal uncertainty entrepreneurs do not tend to keep low the relative size of initial investment.

The second form of uncertainty is “external”. “Input costs” uncertainty has been defined as the difficulty in forecasting the costs of inputs and the prices of outputs (Dixit & Pyndick, 1994). It is possible to define as “external” the uncertainty depending on conditions that are in the firm’s environment and are outside the control of the entrepreneurial team (McGrath, 1997). External uncertainty cannot be reduced by actions made by the founders, nor by rapid investments. However, as time passes the firm can obtain new information that can affect the desirability of the investment. Therefore under conditions of high external uncertainty waiting has a value, while the decision to invest immediately on a large scale creates an opportunity cost related to the abandonment of the possibility of obtaining new information on the desirability of the investment or on the way to realize it better in the future (Dixit & Pyndick, 1994). This point builds on the real option perspective for investment (Bowmann & Hurry, 1993), which stresses that in many cases making investments involves giving up the possibility of waiting for other information. Therefore external uncertainty creates pressure to postpone the investment (McGrath, 1997).

In the new venture creation process, external uncertainty depends mainly on the competitive environment in which the new venture will enter. Studies in the field of strategic management and entrepreneurship have demonstrated how new small businesses are affected by industry-specific factors external to the firm. This is because if compared with older and larger firms, new ventures have fewer possibilities of impacting on the environment in which they operate, and so they are particularly vulnerable to events and things that may happen in the environment. External uncertainty is caused by factors such as decreasing demand in the market, fast technological change and strong competition. In highly uncertain environmental contexts a rational choice would be to make the minimum required investment necessary to exploit the market opportunity, while waiting for new information that may indicate the advisability of investing later on a larger scale.

Hypothesis 2: Under conditions of high external uncertainty entrepreneurs tend to keep low the relative size of initial investment.

Resource uncertainty is the third form of uncertainty. It refers to the concrete capacity of acquiring all the resources needed to realize the project, given the firm’s initial equipment and the possibility of having access to other resources. Only in a few cases are all the production factors necessary for a project immediately available. Their unavailability may be due to difficulties in finding a specific resource on the market or to the lack of capital needed to acquire it. Thus the difficulties in acquiring resources depend on the context in which the venture operates and on some characteristics of the firm. The presence of high uncertainty regarding resources generates a tendency toward the postponement of the investment, waiting for the actual availability of resources. As in the case of high external uncertainty, also for high resource uncertainty waiting has a value.

Resource scarcity is a condition usually associated with new ventures. The majority of new organizations have very limited access to capital, inputs and qualified human resources, this factor having been considered as influencing the “liability

of newness" (Stinchcombe, 1965). The entrepreneurial capacity of acquiring all the resources needed to realize the project is influenced by the environment in which the potential entrepreneur operates (Dubini & Schillaci, 1988) and by the effectiveness of the founder's personal network (Birley, 1985). A beneficial environment, a wide and effective social capital possessed by partners and the presence of personal and family funds facilitate the acquisition of the initial assets.

Entrepreneurial resource uncertainty refers to the difficulty in obtaining assets, goods and human resources necessary to start the business and to survive in the event of initial unfavourable conditions. Under conditions of high perceived resource uncertainty the founders are supposed to reduce the relative size of initial investment. On the other hand, in new firms low uncertainty regarding resources is supposed to act towards an acceleration of the investment, because the availability of resources creates pressure to use them quickly to pursue a good business opportunity.

**Hypothesis 3:** Under conditions of high resource uncertainty entrepreneurs tend to keep low the relative size of initial investment.

As previously stated when presenting the two different behaviours that can be adopted by entrepreneurs when dealing with asset acquisition, a larger relative size of initial investment can be considered as having the potential of favouring higher rates of growth, supporting the firm in reaching a size compatible with the competitors already present in the market. On the other hand, asset parsimony is considered to lead the ventures to greater efficiency but it favours slower expansion of the activity. Therefore it is possible to hypothesize that entrepreneurs investing from the beginning on a larger scale should obtain better growth rates in early sales.

**Hypothesis 4:** Firms with a larger relative size of initial investment have greater sales growth.

#### RESEARCH DESIGN AND MEASURES

The hypotheses were tested on a sample of 124 new ventures, located in southern Italy, which received for start up the incentives of "Law 44", the largest Italian assistance program for new venture creation. At the time of data collection, firms were 2 to 9 years old. The sample is referred to the universal set of Law 44 "healthy" firms and is representative of the population as regards size of start-up investment, regional location and age.

Law 44 was established in 1986 and is still operating. It supports new ventures created by entrepreneurs up to 35 years old. The program funds up to 90% of total start-up investment, 30% as a loan with a reduced rate of interest, and from 40 to 60% as a grant, thereby greatly reducing the amount of capital needed. Firms benefit also from coverage of approximately 30-40% of the operating expenses (raw materials, payment for services) incurred in two years of operation. Start-up investment must not exceed 5 billion lire (approximately 2,500,000 EURO); salaries are excluded from operating expenses.

The choice of government-aided new ventures for field analysis was motivated by the need for limiting parsimonious behaviours caused by risk aversion or unavailability of financial resources. "Law 44" discourages entrepreneurs in the use of asset parsimony (Maggioni, 1997). Among these entrepreneurs, parsimonious initial investments are supposed to be a deliberate choice aimed to increase the return on capital or to reduce the risks connected with the new ventures. However, the use of government-aided firms involves consideration of the mode and procedures by which the incentives are given being taken into account when evaluating the results.

Data were retrieved from a database of 132 new ventures, which had been constructed at the Seconda Università di Napoli in the context of the research program "Beyond Start-up". The database contains data collected through mailed questionnaires and economic and financial data retrieved from company balance sheets.

Both qualitative and quantitative variables were used. In order to measure the relative size of initial investment, the *asset intensity* variable was constructed, comparing total investment to sales (year 1993). Therefore higher asset intensity indicates a large scale investment, while lower asset intensity indicates asset parsimony. Asset intensity is not significantly correlated to firms' age.

Initial investment decisions were considered as dependent on perceived internal, external and resource uncertainty, rather than on objective internal and external conditions. For each variable measuring uncertainty, the information in the database is awarded scores on a 1-5 scale, representing the entrepreneurs' perceptions at the time of start up.

*Internal uncertainty* was measured through six variables related to the founders' background (MacMillan, Siegel & Subbanarisimha, 1985; Goslin & Barge, 1986; Sandberg, 1986): previous business start-ups; work experience in the same industry, work experience in similar industries; knowledge of the specific market; possession of distinctive competencies and possession of distinctive skills. For each of these variables, a score of 5 represents the lack of that background (high internal uncertainty) and a score of 1 represents possession of that background (low internal uncertainty).

*External uncertainty* was measured through four variables related to the competitive environment: the intensity of competition, the intensity of the reactions expected by competitors, the degree of technological change, the rate of growth or reduction of the market. Entrepreneurs aiming to obtain the support of Law 44 must develop a business plan to be positively evaluated. Therefore for these ventures competitive factors are the most investigated external characteristics, and thus the most likely variables to influence the founders' decisions. Moreover, the selected factors have been identified in previous research (Stuart & Abetti, 1987; Romanelli, 1989; McDougall, Covin, Robinson & Herron, 1994) as affecting new business. For each of these four variables, scores of 5 represent the strong presence of that factor (high external uncertainty) and scores of 1 the low presence of that factor (low external uncertainty).

*Resource uncertainty* was measured through three variables related to the difficulty in acquiring raw materials, acquiring a specialized workforce and in acquiring capital. For each variable a score of 5 represents great difficulty (high resource uncertainty) and a score of 1 represents little difficulty (low resource uncertainty).

*Sales growth* was measured as percent variation of sales from 1993 to 1994. The growth of sales is widely used in entrepreneurial empirical research as a variable measuring new venture performance (Stuart & Abetti, 1987; Cooper et al., 1994; Chandler & Hanks, 1994; Sorrentino, 1997).

All the analyses were performed using the package SPSS. Descriptive statistics for all the variables are presented in Table 1 below.

Variable	Answer	Mean	Std Dev	Minimum	Maximum
Asset Intensity (year 1993)	quantity	5.03	5.49	0.64	25.02
Previous business start-ups	score	4.08	1.42	1	5
Work experience in the same industry	score	2.77	1.63	1	5
Work experience in similar industries	score	2.89	1.53	1	5

Knowledge of the specific market	score	2.46	1.11	1	5
Possession of distinctive competencies	score	2.92	1.48	1	5
Possession of distinctive skills	score	2.69	1.19	1	5
Intensity of competition	score	3.18	1.13	1	5
Reaction expected by competitors	score	3.02	1.35	1	5
Degree of technological change	score	3.24	1.17	1	5
Growth/reduction of the market	score	3.12	1.17	1	5
Difficulties in acquiring raw materials	score	1.92	1.14	1	5
Difficulties in acquiring workforce	score	3.37	1.33	1	5
Difficulties in acquiring capital	score	3.64	1.29	1	5
Sales Growth (year 1994 vs. 1993)	quantity	0.40	0.94	-0.72	4.90

## ANALYSES AND RESULTS

For hypotheses 1-2-3, regarding the impact of internal, external and resource uncertainty on the relative size of initial investment, the significance of three full models was tested through multiple backward regression analysis, aiming to identify the variables that have a significant influence on the asset intensity.

In evaluating the role of internal uncertainty, we regress asset intensity on six independent variables (Model 1): previous business start-ups; work experience in the same industry, work experience in similar industries; knowledge of the specific market; possession of distinctive competencies, and possession of distinctive skills. For these variables, higher scores represent a higher perceived internal uncertainty. Therefore the expected sign for all the independent variables is positive. In Table 2 we report the results. The results show how in this sample only the internal uncertainty caused by the lack of distinctive competencies has a significant positive relation with asset intensity. The uncertainty caused by the lack of distinctive skills has a partially significant positive relation with asset intensity. Contrary to what was hypothesized, uncertainty regarding weak work experience in similar industries has a partially significant negative relation with the dependent variable. The positive relations between asset intensity and both the uncertainty caused by the lack of distinctive competencies and the uncertainty caused by the lack of distinctive skills are consistent with hypothesis 1.

Dependent variable: Asset intensity Independent variables	Expected sign	Coefficients	p-value
Constant		2.085	
Previous business start-ups	+	removed	
Work experience in the same industry	+	removed	
Work experience in similar industries	+	-0.908	0.0592

Knowledge of the specific market	+	removed	
Possession of distinctive competencies	+	1.222	0.0443
Possession of distinctive skills	+	0.965	0.0885
Ad. R- squared	0.06		
F	2.53		0.0633

For the evaluation of the role of external uncertainty, we regress asset intensity on four independent variables (Model 2): the intensity of competition, the intensity of the reactions expected by competitors, the degree of technological change, the rate of growth or reduction of the market. For these variables, higher scores represent a higher external uncertainty perceived by entrepreneurs. Therefore the expected sign for all the independent variables is negative. The results (Table 3) show that only the external uncertainty caused by the expectation of a strong reaction by competitors has a partially significant negative relation with asset intensity. In this sample, the founders that expected an intense reaction from direct competitors on their entering the market realized smaller initial investments. This finding is consistent with hypothesis 2. The other variables have no significant influence on the considered dependent variable.

<b>Table 3</b> <b>Regression results: Model 2</b> <b>External uncertainty and Asset intensity</b>			
Dependent variable: Asset intensity	Expected sign	Coefficients	p-value
Independent variables			
Constant		8.107	0.0000
Intensity of competition	-	removed	
Reaction expected by competitors	-	- 0.961	0.0557
Degree of technological change	-	removed	
Growth/reduction of the market	-	removed	
Ad. R- squared		0.04	
F		3.780	0.0557



In evaluating the role of resource uncertainty, we regress asset intensity on three independent variables (Model 3): the difficulty in acquiring raw materials, acquiring a specialized workforce and the difficulty in acquiring capital. For these variables, higher scores represent a higher perceived resource uncertainty. Therefore the expected sign for all the independent variables is negative. The results (Table 4) show that none of the variables is significantly associated with the asset parsimony of the sample firms.

Dependent variable: Asset intensity Independent variables	Expected sign	Coefficients	p-value
Constant			
Difficulties in acquiring raw materials	-	removed	
Difficulties in acquiring workforce	-	removed	
Difficulties in acquiring capital	-	removed	
Ad. R- squared		n.a.	
F		n.a.	