Samuel Neaman Institute
FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY

What Affects Technion Faculty Members' Decision to Found a Start-Up Firm?

Effects of the Business Opportunity and the Entrepreneur's (Faculty Members) Personal Characteristics

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30 Science, Technology and the Economy Program (STE)
Working Papers Series STE-WP-30-2005

Technion - Israel Institute of Technology

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STE WP30[1]

November 2005

[1] This is a report on a research project conducted as part of the activities of the Science Technology and the Economy Program, (STE), at the Samuel Neaman Institute for Advanced Studies in Science and Technology. Support for that project from the Institute is gratefully acknowledged. This paper presents the authors' own view and not that of the Samuel Neaman Institute for Advanced Studies in Science and Technology or any members of its staff. This report is based on Oshrat Kremer Srabstien MSc thesis done under the supervision of professors Erez and Fiegenbaum.

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ABSTRACT

While research has recognized the importance of the entrepreneurial opportunity evaluation (EOE) stage in affecting overall entrepreneurship activity, only venture capitalists' (VCs) perspectives were explored. No research has attempted to understand the crucial and complementary role of entrepreneurs' points of view. In an effort to fill this gap, the current study focuses on the entrepreneur point of view and proposes a new framework centered on two perspectives affecting the EOE: the multifaceted characteristics of the opportunity and the characteristics of the entrepreneur who evaluates the opportunity. In regard to the former, we refer to three characteristics of a business opportunity: industry, including both size and competition; product innovation, covering both market and technological innovation; and the entrepreneur within the opportunity context, comprising both his familiarity with, and commitment to the opportunity. In regard to the characteristics of the entrepreneur we examine his/her experience in entrepreneurial activities and his/her personal dispositions for risk taking and initiative. In regard to the EOE outcome, we assume that entrepreneurs, like VCs, are profit maximizes who consider the economic value of their decision to move in and exploit a new opportunity. The opportunity's economic value is described in terms of the probability to be exploited and its expected profit. Our basic research hypothesis, linking EOE characteristics and outcomes, postulates that the EOE outcome will be higher when the attractiveness of the opportunity characteristics increases. We also compare the relative importance of the opportunity characteristics emphasized by the Resource Based View (RBV) perspective, with those opportunity characteristics emphasized by the Market Based View (MBV) perspective. In addition, we suggest that EOE will be higher for entrepreneurs who are more, rather than less experienced, and oriented toward risk taking and initiative.

A sample of 204 (33%) faculty members at the Technion–Israel Institute of Technology, who are potential or actual entrepreneurs, were presented with different entrepreneurial opportunity scenarios and were asked to evaluate the opportunities and their respective outcomes. Using conjoint analyses the following major findings were revealed. First, both the opportunity characteristics and the entrepreneur's individual characteristics had an impact, although different ones, on the decision to exploit an opportunity, and on its expected profit. Second, the opportunity's RBV perspective found to have more impact on the decision to exploit an opportunity than the MBV perspective, and there were ambiguous findings regarding the expected profit. Third, the entrepreneur's personal dispositions toward both risk taking and initiative effects the decision to exploit, but only risk taking propensity effects the expected profit.

These findings are especially important for universities that wish deepen their academia–industry technology transfer and commercialization activities. The results of our study should enable university decision makers, professors, and potential entrepreneurs, to better manage and evaluate the entrepreneurship process and its expected outcome. As a result, it can improve the crucial decision of whether and how to encourage faculty members to add entrepreneurial activities to the current important activities of research, teaching and administration.

Key words: Technological Entrepreneurship in an Academic Setting, Opportunity Discovery, Opportunity Evaluation, Founding a New Start-Up,

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Non-Technical Summary

While research has recognized the importance of the entrepreneurial opportunity evaluation (EOE) stage in affecting overall entrepreneurship activity, only venture capitalists' (VCs) perspectives were explored. No research has attempted to understand the crucial and complementary role of entrepreneurs' points of view. In an effort to fill this gap, the current study focuses on the entrepreneur point of view and proposes a new framework centered on two perspectives affecting the EOE: the multifaceted characteristics of the opportunity and the characteristics of the entrepreneur who evaluates the opportunity. In regard to the former, we refer to three characteristics of a business opportunity: industry, including both size and competition; product innovation, covering both market and technological innovation; and the entrepreneur within the opportunity context, comprising both his familiarity with, and commitment to the opportunity. In regard to the characteristics of the entrepreneur, we examine his/her experience in entrepreneurial activities and his/her personal dispositions for risk taking and initiative. In regard to the EOE outcome, we assume that entrepreneurs, like VCs, are profit maximizes who consider the economic value of their decision to move in and exploit a new opportunity. The opportunity's economic value is described in terms of the probability to be exploited and its expected profit. Our basic research hypothesis, linking EOE characteristics and outcomes, postulates that the EOE outcome will be higher when the attractiveness of the opportunity characteristics increases. We also compare the relative importance of the opportunity characteristics emphasized by the Resource Based View (RBV) perspective, with those opportunity characteristics emphasized by the Market Based View (MBV) perspective. In addition, we suggest that EOE will be higher for entrepreneurs who are more, rather than less experienced, and oriented toward risk taking and initiative.

A sample of 204 (33%) faculty members at the Technion–Israel Institute of Technology, who are potential or actual entrepreneurs, were presented with different entrepreneurial opportunity scenarios and were asked to evaluate the opportunities and their respective outcomes. The following major findings were revealed. First, both the opportunity characteristics and the entrepreneur's individual characteristics had an impact, although different ones, on the decision to exploit an opportunity, and on its expected profit. Second, the opportunity's RBV perspective found to have more impact on the decision to exploit an opportunity than the MBV perspective, and there were ambiguous findings regarding the expected profit. Third, the entrepreneur's personal dispositions toward both risk taking and initiative effects the decision to exploit, but only risk taking propensity effects the expected profit.

INTRODUCTION

Entrepreneurship is an important mechanism in the economy of the modern world and hence, governments in industrialized countries have been running programs to enhance the motivation and opportunities for individuals to become self-employed or establish businesses with employees (De Koning & Snijders, 1992; Praag & Pohem, 1995). In recent years, many entrepreneurs, from both academia and industry, have made the transition from being nascent entrepreneurs, theoretically considering starting a business, to actually establishing new ones (Carter, Gartner & Reynolds, 1996; Shane, 2002). Since universities have a large pool of faculty members and hence, the potential for entrepreneurship activities, we follow research focused universities, such as MIT (Shane, 2002), but this time from an outside the USA focus, which is less explored in academia, even though entrepreneurship is a global phenomenon.

Entrepreneurship has been defined as the discovery, evaluation, and exploitation of an opportunity (Shane & Venkataraman, 2000). Despite the centrality of opportunity evaluation to the field of entrepreneurship, this stage has hardly been studied. Evaluation of an entrepreneurial opportunity is a complex process. Entrepreneurial opportunities have to be evaluated with little information, using few resources, and with higher levels of uncertainty than other kinds of evaluations undertaken in business (Venkataraman, 1997). Neither the probabilities of future events, nor their future incomes, are known in advance, thus the expected outcomes of entrepreneurial activities are difficult to evaluate, and predict. Existing research on opportunity evaluation concentrates on the VCs' points of view only. In contrast, the present study, to the best of our knowledge, is the first to focus on the entrepreneur. Our major assumption is that entrepreneurs, similar to VCs, are profit maximizers. Following the existing research on VCs' opportunity evaluation (e.g., Shephered & Zacharakis, 1997; Zacharakis & Meyer, 1998; Shephered, 1999; Shephered, Ettenson & Crouch, 2000; Zacharakis & Meyer, 2000; Shephered, Zacharakis & Baron, 2003) we propose a new framework for understanding entrepreneur EOE characteristics, focusing on both the opportunity itself, and the characteristics of the entrepreneur who makes the evaluation. These two groups of factors affect the decision on whether to exploit the opportunity and its expected profit.

Early research on entrepreneurship pointed at the influence of the personal characteristics of the entrepreneur on the decision to pursue entrepreneurial activities (Shane, 2003). For example, people who are more risk tolerant are seen as more likely to found firms than people who are less risk tolerant (Khilstorm & Laffont, 1979). However, recent research has argued that this person-centric view is incomplete. Entrepreneurial activity in general, and the decision to found a new firm in particular, are a function of the interaction of enterprising individuals and potentially valuable opportunities (Shane & Venkataraman, 2000; Eckhardt & Shane, 2003). Similar to the argument made by organizational behavior and psychology literature – that human behavior is influenced by the situations in which people find themselves rather than simply by their characteristics (Davis-Blake & Pfeffer , 1989) – this perspective on entrepreneurship suggests that the nature of business opportunities themselves influence the decisions of people to found firms so as to exploit them. While this argument is logical and has some basic face validity, we have no direct empirical evidence to show that the nature of business opportunities influences the entrepreneurial decision to found new firms to exploit them. Entrepreneurs are commonly identified after they make the decision to exploit an opportunity. Apparently, identifying them prior to the decision and investigating the factors that influence their decision is difficult to obtain. This may explain the lack of research on EOE.

The present research studies EOE by presenting to potential entrepreneurs scenarios consisting of three major characteristics associated with an opportunity worth exploiting: industry attractiveness, innovation uniqueness, and the entrepreneur's familiarity and commitment to the opportunity. In addition, the research examines the effects of three personal characteristics of the entrepreneur on his/her decision to exploit an opportunity, and his/her evaluation of the potential profit to be made by it: prior entrepreneurial experience, personal disposition for risk taking and for initiative.

The research was conducted within an academic setting, the Technion – Israel Institute of Technology. Academic organizations have a great potential for developing new ideas and inventions. In recent years, university technology licensing activity and supporting institutional arrangements have grown rapidly (Mowery & Shane, 2002; Azoulay, Ding, & Stuart, 2004). Moreover, much of this activity involves efforts by

"start-ups" and small, young, technology-intensive firms to commercialize technologies developed by university faculty, staff, and students (Mowery & Shane, 2002). Many universities have adopted specific policies and procedures to encourage technology licensing, and some of them have even incorporated technology licensing into their strategy plans (Shane, 2002). Given this reservoir of opportunities, we chose to focus on academic faculty members in science and engineering as our research population. Nevertheless, the framework developed is general enough to include other potential entrepreneurs in different contexts.

We chose our major methodology to be Conjoint Analysis. Research that examined how well VCs introspect about their own decision process reveals that VCs are not very successful at it. In Zacharakis and Meyer (1998), VCs self-reported in a series of real time decisions using scenarios (conjoint analysis methodology), and later were asked to provide a weighting of how they believe they used the information factors that were in the scenarios. Comparing the captured decision policies to the stated decision policies revealed that VCs lacked a strong understanding of how they make decisions. The findings of the research suggest that entrepreneurs might not be aware of their decision making process too, and that using the Conjoint Analysis method could minimize the biases caused by self-reporting methods.

The research proceeds as follows: The next section describes the research model and its theoretical background, laying the ground for the hypotheses developed. We then describe the methodology, including the sample, data collection and procedure, followed by the results section. The final section provides a discussion, including implications for future research.

THEORY DEVELOPMENT AND HYPOTHESES

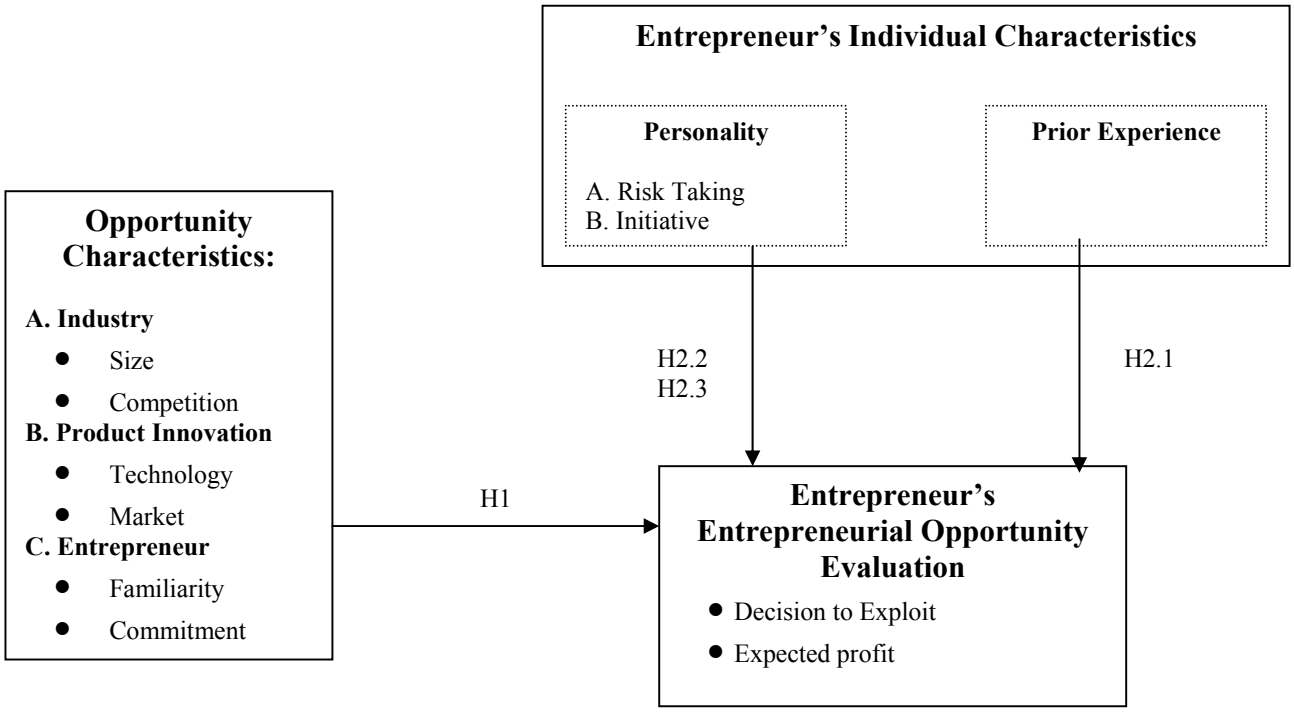
The field of entrepreneurship involves the study of the entrepreneur's characteristics, and the opportunity evaluation process, which consists of three stages: discovery, evaluation, and exploitation (Shane & Venkataraman, 2000). Despite the centrality of the second stage of entrepreneurial opportunity evaluation (EOE), there is minimal research on this bridging stage. Previous efforts to predict the decisions made by entrepreneurs who founded firms have focused almost exclusively on the attributes of the people making the decisions (Shane, 2003). For instance, research demonstrated that entrepreneurs showed higher levels of initiative (Frese et al., 1997), need for achievement, need for affiliation, need for authority, self-efficacy and creativity than managers (Baum et al., 1993). Recently, several researchers have argued that the decision to found a firm is the result of the confluence of certain types of individual characteristics and valuable business opportunities (Shane & Venkataraman, 2000). To improve our knowledge in this area, researchers have called for an examination of the main effect of opportunity characteristics on the decision to exploit (Eckhardt & Shane, 2003). Previous research examined the evaluation of opportunity characteristics from the perspective of the VCs, but not from the entrepreneur's point of view (Shane & Venkataraman, 2000).

The EOE stage is the link between the discovery stage, after a potential entrepreneur has found an opportunity, and before the exploitation stage, when she/he decides whether to exploit it. The current study focuses on the EOE characteristics and outcomes. We propose a new model, as presented in Figure 1, for studying the entrepreneur's opportunity evaluation characteristics and its impact on outcome measures. Most of the theoretical foundations for our model are drawn from research knowledge accumulated from the VCs' perspective. Although entrepreneurs' considerations for establishing new firms may differ from those of VCs, who are ones who finance them, the research literature identified characteristics of the opportunities that make them more attractive for exploitation, whether in terms of establishing a new firm, or investing in it. Our model consists of two major building blocks: characteristics of the entrepreneurial opportunity, and personal characteristics of the entrepreneur. The outcomes of the entrepreneur's evaluation process are in terms of the probability of exploiting the new opportunity and its expected profit.

FIGURE 1:

Research Model –

The Entrepreneur's Entrepreneurial Opportunity Evaluation (EOE) Process and Outcome



Opportunity Characteristics Impact on EOE Outcomes (H1)

In the absence of any theoretical and empirical research on the entrepreneur's opportunity evaluation characteristics and outcomes (Shane & Venkatraman, 2000), we draw our theoretical foundation from the literature of VCs on this topic. In fact, adapting the perspectives of VCs, who need to evaluate business opportunities before they make an actual financial commitment to invest in a business opportunity, provides a benchmark for these two important yet sometimes contradictory perspectives. Entrepreneurs and VCs both have to evaluate an opportunity within the same market conditions, but their points of view might be different. While VCs' main motivation is to maximize profit; entrepreneurs who are generally technology oriented also have emotional and technological considerations. Our assumption is that even though entrepreneurs may also

be motivated by curiosity about the technology, and by an emotional attachment to their innovative ideas, their primary motivation, like VCs, is profit maximization.

Zacharakis and Meyer (1998) summarized the VC literature on information gathering and criteria used for making financial commitment decisions. According to their research, the criteria can be classified into four categories: market-industry, product innovation, the profile of the entrepreneur and potential return on investment. The last one, potential return on investment, serves as our dependent variable and will be further described in the Dependent Variables section. The former three serve as our independent variables describing the opportunity characteristics. Each opportunity characteristic is represented in our study by two variables. Market-industry is represented by *size* and *competition*. These reflect the interaction between industry demand and supply characteristics and they are well documented in the organizational strategy literature (Porter, 1980). Product-innovation refers to the two complementary innovation perspectives: *technological innovation* and *market innovation*. These two criteria represent the two dimensions of product innovation – technology focus and customer focus (Benner & Tushman, 2002). Finally, the entrepreneur characteristics associated with the opportunity consists of the *entrepreneur's familiarity with the target market* and the *commitment needed by him for establishing a new enterprise*. These characteristics describe the entrepreneur within the context of the opportunity, and they do not characterize the personality of the entrepreneur who evaluates the opportunity, which will be examined separately. In the following section we discuss each criterion and its related hypotheses:

Market Size. Large rather than small markets are better for founding of new companies for several reasons (Porter, 1980). First, larger markets can support more competitors than smaller markets, justifying entry of more new participants. Second, there is room for a niche strategy in large markets and this strategy is mostly preferred by small and start-up companies (Schell & David, 1981; Dean, Brown & Bamford, 1998; Ventresca, Washington, Diadlin & Lacey, 1999). Third, large markets contain big companies that are always on the lookout for innovation, which can be acquired by buying small firms rather than developing internal new business opportunities (Baum &

Oliver, 1992; Baum, Korn & Kotha, 1995). These arguments lead to the first set of hypotheses:

H1.1a: The larger the market, the greater the likelihood that the entrepreneur will exploit the opportunity by setting up a company.

H1.1b: The larger the market, the higher the profit that the entrepreneur will expect from exploiting the opportunity by founding a company.

Competition. Less rather than more competitive markets are better for the founding of new companies for several reasons. First, as more firms seek to obtain resources to exploit business opportunities, the availability of these resources declines. The reduced availability raises the cost of obtaining these resources, hindering profit margins for new firms and, in some cases, making them difficult to obtain, if at all (Carroll & Delacroix, 1982; Delacroix & Carroll, 1983; Delacroix, Swaminathan & Slot 1989). Second, competition offers customers more options for the supply of products and services that they need. The availability of multiple options leads customers to demand better terms from the providers of these goods and services (Porter, 1980). As a result, to make sales providers need to cut prices or offer more features for their products and services. These actions reduce profit margins and make markets less appealing to entrepreneurs that seek to enter them. These arguments lead to our second set of hypotheses:

H1.2a: The greater the level of competition, the lower the likelihood that the entrepreneur will exploit the opportunity by setting up a company.

H1.2b: The greater the level of competition, the lower the profit that the entrepreneur will expect from exploiting the opportunity by founding a company.

Technological Innovation. More technologically innovative products are better for being the basis of new firms than less technologically innovative ones. Technological innovation generally means that the firm will be developing products and services that meet needs that have not been met before or will be meeting customer needs in a new way that is superior to that offered by existing alternatives (Casson, 1995). Several studies have shown relationships between new firm formation and rates of technological change (Blau, 1987; Shane, 1996). In addition, technological innovation makes it possible for new firms to develop products that can be differentiated from those offered by existing competitors. This differentiation is valuable because the status quo bias leads customers to stick with existing suppliers of products and services unless the alternative

provided by the new producer is visibly better than the existing alternative. Furthermore, technologically innovative products can often be protected against imitation by legal mechanisms, such as patents. Deterring imitation influences efforts by entrepreneurs to start new firms because imitation increases competition and so undermines the profitability of new firm formation efforts. These arguments lead to the third set of hypotheses:

H1.3a: The greater the degree of technological innovation, the greater the likelihood that the entrepreneur will exploit the opportunity by founding a company.

H1.3b: The greater the degree of technological innovation, the higher the profit that the entrepreneur will expect from founding a company.

Market Innovation. We consider market innovation to be the way the market's customers perceive the innovation of the products in terms of their attributes. To attract customers, a new business must provide products or services that meet the market needs and do so better than existing companies that already have relationships with customers. Market innovation occurs either by improving the current attributes of the products or by offering new attributes. These attributes can be the result of either lowering the current cost of the product or enhancing the quality of the product. The status quo bias and the ties between existing customers and established firms mean that new firms cannot attract customers for their new products unless they are better than those offered by established firms in some dimension, be that price or features. Moreover, marketing innovation is important because established firms are stimulated by their "captured" customers to focus on incremental improvements of their existing products rather than to develop innovative new products (Christiansen & Bower, 1996). As a result, existing firms tend not to compete with new firms for new segments of customers interested in innovative new products, making the pursuit of innovative products and services attractive for new firms. These arguments lead to the fourth set of hypotheses:

H1.4a: The greater the degree of market innovation, the greater the likelihood that the entrepreneur will exploit the opportunity by setting up a company.

H1.4b: The greater the degree of market innovation, the higher the profit that the entrepreneur will expect from founding a company.

Familiarity with the market. People are more likely to exploit opportunities that fall within their knowledge base than ones that are alien to them. Research shows that people are more likely to identify opportunities to start businesses in areas related to their prior market and technical knowledge (Shane, 2000). Entrepreneurs with prior experience have greater information about demand conditions, and higher familiarity with marketing as a whole than entrepreneurs with no prior experience (Knight, 1921; Shane, 2003). As a result, several studies have shown that establishing a new enterprise is more common when the entrepreneur has prior experience and greater familiarity with the industry in which he/she identified an opportunity (Praag & Pohem, 1995; Aldrich, 1999). In addition, investors are more likely to support people with industry experience than those without industry experience. Shepherd (1999) studied the criteria that are most important for VCs in their profitability assessment of new venture. He found that the most important criterion is the level of the management's experience and knowledge about the industry being entered. In other words, the probability of finding financing for a business is higher if the founder has experience in the same industry. Other studies reported that success is more likely to be achieved by persons entering an industry in which the management team has prior experience (Roure & Maidique, 1986). These arguments lead to the fifth set of hypotheses:

H1.5a: The more the opportunity falls within the entrepreneur's knowledge base, the greater the likelihood that the entrepreneur will exploit the opportunity by founding a company.

H1.5b: The more the opportunity falls within the entrepreneur's knowledge base, the higher the profit that the entrepreneur will expect from founding a company.

Required Level of Commitment. Business opportunities that require greater levels of commitment discourage new firms from starting. Entrepreneurs can always use their time in some other ways that are valuable to them. This weighing up the situation and deciding whether or not to go ahead is known as the entrepreneur opportunity cost (Hamilton & Harper, 1994). The greater the demand in terms of time and commitment from an entrepreneur to start a firm, the greater his/her opportunity cost, and consequently, the lower the likelihood of founding a firm, and of making profit out of it. In addition, a high level of commitment requires the academic entrepreneur, who is

basically research driven, to focus only on the activity of founding the firm, to the detriment of his research and academic activities. Because the founding of a firm is uncertain, entrepreneurs strive to mitigate this risk. One common mechanism for mitigating or managing risk is diversification. If the required level of commitment to pursue an opportunity is not high, it enables the entrepreneur to simultaneously allocate time and other resources to other activities that are of value to him/her such as academic research. The ability to diversify resource allocation is beneficial to the entrepreneur and increases the likelihood of going ahead with starting a business to pursue an opportunity. These arguments lead to the sixth set of hypotheses:

H1.6a: The greater the required level of commitment needed to exploit an opportunity, the lower the likelihood that the entrepreneur will exploit that opportunity by founding a company.

H1.6b: The greater the required level of commitment needed to exploit an opportunity, the lower the profit that the entrepreneur will expect from founding a company.

Resource-Based View *versus* Market-Based View

There are currently two highly different and complementary theoretical perspectives in the organizational strategy literature that explain strategic choices and superior performance. The first is based on industrial organizational economics, and takes an external market orientation to address this issue. This perspective, which we refer to as the Market-Based View of the firm (MBV), focuses on "outside the black box" – the market – in which a firm competes. According to the MBV, the sources of value for the firm are embedded in the competitive situation characterizing its external product market (Makhija, 2003). In contrast, there is the Resource-Based View of the firm (RBV), which focuses on "inside the black box", the firm's resources and capabilities explain strategic choices and superior performance (Penrose, 1959; Wernerfelt, 1984; Barney, 1986, 1991; Peteraf, 1993;). According to Wernerfelt (1984), a firm's resources are the tangible and intangible assets tied semi permanently to the firm (Wernergelt, 1984: 172). These include all firm-specific assets, capabilities, organizational processes, firm attributes, information, knowledge, etc., that allow the firm to develop strategies benefiting its efficiency and effectiveness (Barney, 1991: 101).

As Henderson and Mitchell (1997) have recently pointed out, there exists little consensus on the relative role of these two influences on firm performance, because a firm's organizational capabilities and market position are fundamentally intertwined. As a result, most researchers have had difficulty distinguishing the two theories' individual contributions to explaining firm performance (McGahan & Porter, 1997).

In this study we explore this challenging theoretical question in the context of the entrepreneurial opportunity evaluation process. We examine which of the theories is more influential on the entrepreneur's decision to exploit an opportunity and his/her profitability assessment. In our study we have both external factors that represent the MBV theory – industry size and level of competition, and internal resources that represent the RBV theory – product and market innovation, as well as a profile of the entrepreneur in the context of the opportunity. We have two competing hypotheses, one supports the MBV theory (H1.7) and the other one supports the RBV theory (H1.8):

H1.7a: The impact of the opportunity's resource based characteristics (product and market innovation and familiarity and commitment of the entrepreneur) on the likelihood of exploiting the opportunity by founding a company is higher than the impact of the opportunity's market based characteristics (size and competition).

H1.7b: The impact of the opportunity's resource based characteristics (product and market innovation and familiarity and commitment of the entrepreneur) on the expected profit from the founding company is higher than that of opportunities market based characteristics (size and competition).

Alternatively:

H1.8a: The impact of the opportunity's market based characteristics (market size and competition) on the likelihood of exploiting the opportunity by founding a company is higher than impact of the opportunity's resource based characteristics (product and market innovation and familiarity and commitment of the entrepreneur).

H1.8b: The impact of the opportunity's market based characteristics (market size and competition) on the expected profit from the founding company is higher than that of the opportunity's resource based characteristics (product and market innovation and familiarity and commitment of the entrepreneur).

Entrepreneur's Individual Characteristics (H2)

The entrepreneurship literature has emphasized individual characteristics, both experience and personal disposition, in explaining entrepreneurial behaviors and each of them is next discussed.

Experience

At present, researchers have not yet developed any guidelines for directing entrepreneurs when evaluating entrepreneurial opportunities. Therefore, we expect that they learn effective modes of evaluation used by entrepreneurs by doing. Hence, experienced entrepreneurs might differ from novice entrepreneurs in their modes of opportunity evaluation.

Previous research found differences between high and low experienced entrepreneurs in many aspects, e.g., parental background, work experience, reasons leading to start-ups and personal attitudes toward entrepreneurship (Westhead & Wright, 1998). While there is no research on the effect of experience on EOE, the research literature on VCs demonstrated that their level of experience affects the reliability of the evaluations of VCs, and that the relationship between experience and reliability is curvilinear. Reliability of the VCs' evaluations improved as their level of experience increased from low to moderate, but it decreased as their level of experience increased from moderate to high (Shepherd, Zacharakis & Baron, 2003).

Based on previous research on the role played by experience in VCs' evaluations, we hypothesize a positive relationship between entrepreneurs' level of experience and their opportunity evaluation as follows:

H2.1a: The more experienced the entrepreneur, the greater the likelihood that he/she will exploit the opportunity by founding a company.

H2.1b: The more experienced the entrepreneur, the higher the profit that the entrepreneur will expect from founding a company.

Personal dispositions

Risk Taking. Prior research demonstrated that attitudes toward risk are important determinants of choice under uncertainty (Einhorn & Hogarth, 1985; Ghosh & Ray, 1992; 1997). Brockhaus (1980) argued that endowed with a risk-taking propensity best describes entrepreneurs who decide to establish new businesses. Weber, Blais & Betz (2002) developed a specific risk attitude scale for measuring risk perceptions and risk behaviors. They defined five content domains: financial decisions (separately for investing vs. gambling), health /safety, recreational, ethical, and social decisions. They showed that risk taking is highly content-specific, and that there is no consistent risk averse or consistent risk seeking across all content domains. In this study we refer to investment risk, which is central to entrepreneurial activity.

The literature dealing with entrepreneurship has often portrayed the entrepreneur as a "risk taker" who expects to receive profit as a reward for risk-bearing (Palmer, 1971). Yet, studies on risk taking propensity among entrepreneurs have reported mixed findings. On the one hand, there has been some empirical support for the notion that entrepreneurs exhibit moderate risk taking propensities (Brockhaus, 1980; Low & MacMillan, 1988). This suggests that entrepreneurs tend to avoid situations involving extreme risks. On the other hand, Ray (1994) suggested that the role of risk taking in entrepreneurship should not be viewed as a generalized phenomenon. He found that Singaporean entrepreneurs are much stronger risk takers than non entrepreneurs with respect to business decisions, though not with respect to general life decisions. A meta-analysis review of research studies about the relative risk taking propensities of entrepreneurs and managers indicated that the risk propensity of entrepreneurs is greater than that of managers (Stewart & Roth, 2001). Based on the literature reviewed above, we hypothesize that:

H2.2a: The more a risk taker the entrepreneur is, the greater the likelihood that he/she will exploit an opportunity by founding a company.

H2.2b: The more a risk taker the entrepreneur is, the higher the profit that the entrepreneur expects from founding a company.

Initiative. Personal initiative is a behavior syndrome resulting in an individual's taking an active and self-starting approach to work and going beyond what is formally required in a given job. More specifically, personal initiative is characterized by the following aspects: it has a long-term focus, it is goal directed and action oriented, it is

persistent in the face of barriers and setbacks, and it is self-starting and proactive (Frese, Kring, Soose & Zempel, 1996). Personal initiative is related but not identical to entrepreneurship (Hisrich, 1990). Initiative and entrepreneurship both imply the use of productive, creative and active strategies, and overcoming problems when they occur. For this reason, it is expected that entrepreneurs should show a higher degree of initiative than non entrepreneurs (Frese et al., 1997). Therefore, we state the formal hypotheses:

H2.3a: The more initiative the entrepreneur has, the greater is the likelihood that he/she will exploit the opportunity by founding a company.

H2.3b: The more initiative the entrepreneur has, the higher is the profit that he/she expects to get from founding a company.

METHODS

Sample

We approached the 626 academic members of the Technion by mail with a letter that described the subject of the research, and asked them to participate in the study. Of this population, 204 people (33 percent of the population) ultimately participated in the study. Our sample was 86% male and 14% female. The age range was from 28 to 75 years, with a mean of 52 years. The average tenure as an academic member was 16 years. To ensure that there were no systematic differences between participants and non-participants, we compared the age, seniority, and prior experience of the participants and non-participants and found no significant differences.

Scenarios Presentations and Conjoint Analysis Technique

Conjoint analysis is a technique that requires respondents to make a series of judgments based on profiles (or scenario) of certain attributes. A profile is simply a combination of all the attributes (in our study – the opportunity characteristics), where each attribute is described by one of its levels (a level is an assigned value for an attribute). The conjoint analysis enables estimation of values of profile components and identifies the relative importance of each attribute. Conjoint analysis and policy capturing have been used in hundreds of studies of judgment and decision-making (Stewart, 1988; Green & Srinivasan, 1990).

In this research we used conjoint analysis with a fully crossed factorial design involving six attributes at two levels, requiring 64 scenarios. An orthogonal fractional factorial design was used to divide the 64 scenarios into eight groups of eight scenarios, thus the decision-making task contained a more manageable number of scenarios (Green & Srinivasan, 1990). Orthogonal design means that each level of each attribute is combined equally with each level of another attribute. Consequently, there is no inter-dependence in the way decision criteria are presented to the participants.

We selected six out of the eight groups of scenarios, and each participant randomly got one group. The order of the scenarios within each group was also randomized, to avoid order effects. In addition, there were two optional orders for the criteria within each

scenario, half of the participants received the scenarios in one order across all eight scenarios, and the second half of them received the other order. Moreover, we chose eight scenarios as holdout cases, enabling cross validation. Four holdout cases were added to each group, which meant that each participant responded to twelve scenarios, presented in a random order.

Consistent with previous research using conjoint analysis (e.g. Shepherd, 1999; Shepherd, Ettenson & Crouch, 2000; Shepherd et al., 2003), we presented the respondents with the differences in the scenarios in tables, which displayed high and low values on the attributes. As Green and Srinivasan (1990) explained, though some industry studies still employ paragraph descriptions, profile cards (with terse attribute-level descriptions) are by far the more popular stimulus presentation method. The benefit of simple profile cards over deeper descriptions is that researchers can avoid confounding respondents' ability to elucidate the relevant facts from the story and evaluate them. Because our purpose was to measure their evaluations of the facts muddling up their ability to draw the facts from the stories, the terser profile card approach was appropriate in our context.

To guarantee that the attributes of the conjoint analysis had face validity and ensure that we did not present too many scenarios to participants, we conducted an initial interview with three experienced entrepreneurs. These interviews confirmed that the six attributes that were selected for evaluation (the six opportunity characteristics) are relevant and important ones used by entrepreneurs to evaluate business opportunities. In addition, a pilot study was done to confirm that six attributes and twelve scenarios are a reasonable number for respondents to handle in evaluating opportunities.

Task and Procedure

The respondents were instructed to go to a web site where they were asked to make an evaluation of new business opportunities. The web site contained instructions, the choice based conjoint task, and a questionnaire of personal dispositions and demographic information. Participants were asked to imagine that they had discovered the business opportunity described in the scenario and were asked to make a decision

about whether to exploit it or not, and to assess its potential profitability based on the criteria that appeared in the scenarios. The definitions of the criteria were included, and the participants could return to them at any time.

The respondents were asked to evaluate a series of hypothetical scenarios (conjoint profiles), each describing an opportunity in terms of the three opportunity evaluation categories, each assessed by two variables as described below.

Measures

Opportunity characteristics

Below we describe the variables (characteristics) in the scenarios and their definitions presented to the respondents.

Industry size. Number of customers and income from sales within the specific market.

Industry competition. Number of competitors, their size, and the degree of competition among them.

Technological innovation. Degree of technological innovation of the product, compared to existing products.

Market Innovation. Perceived innovation from the customers' point of view – the extent to which customers perceive the product as satisfying new needs.

Familiarity with the target market. Degree of familiarity with the market of the entrepreneur who is going to establish the new company.

Required commitment for establishing a company. Degree of commitment in terms of time and giving up other activities, needed from the entrepreneur to establish a company.

Individual characteristics

Experience. Based on questions in the demographic questionnaire, our sample was divided into three levels of entrepreneurial experience. Low - people who had never had an idea they considered exploiting, had never applied for a patent and had never taken part in founding a company (27%); Medium - people who had ideas they considered exploiting and/or applied for a patent, but had not taken part in founding a company (34%); High - people who took part (at least once) in founding a company (39%).

Risk taking. Attitudes toward risk were measured by a Domain–Specific Risk-Attitude Scale, developed by Weber et al. (2002). This scale examines risk taking

propensity and its determinants in several distinct content areas: financial decisions (separately for investing vs. gambling), health /safety, recreational, ethical, and social decisions (Weber et al., 2002). In our research we used only the risk behavior scale for the investment content area, which consisted of four items. Respondents were asked to indicate for each item the likelihood of engaging in the described activity or behavior. An example of an item is: "investing 5% of your annual income in a very speculative stock". Responses were presented on a 5-point Likert type scale ranging from "very unlikely" to "very likely". The reliability (coefficient alpha) of this questionnaire in our study was 0.77.

Initiative. The initiative questionnaire consisted of ten items. Seven of these were taken from the "personal initiative questionnaire" (Frese et al., 1997) (e.g., "I actively attack problems"), and three were taken from Miron, Erez, and Naveh (2004) (e.g., "I'm especially good in fulfilling ideas"). Responses were presented on a 5-point Likert type scale, from very little, to very much. The reliability (coefficient alpha) of this questionnaire in our study was 0.9.

Dependent variables - EOE outcome variables

The perceived economic value of the opportunities as they appear in the scenarios was measured by two questions pertaining to the decision to exploit the opportunity and its estimated profit.

Decision to exploit. After each scenario, respondents were asked whether they choose to exploit the opportunity or not by answering yes/no. The response reflects the nature of the entrepreneur's decision, which can be either positive or negative.

Profitability Evaluation. After each scenario, respondents were asked to assess the profitability of the venture, assuming it was exploited, on a 5-points scale, from "very low" to "very high".

Statistical Analyses

To test Hypotheses H1.1-1.6 and H2 we used Hierarchical Linear Models (HLM) that take into consideration the repeated measures structure of eight scenarios for each participant. Within the HLM model we used logistic regression (GENMOD procedure) to

decompose the decision into its underlying structures, as represented by the criteria and their corresponding beta coefficients. Logistic regression was used for the two dependent variables. For the "exploitation decision" model because of its binary scale of yes/no. For the "profitability assessment" model because the scale range was 1 to 5, which cannot allow the continuity assumption, and because the answers were not distributed normally (the frequencies from the low to high were: 255, 504, 507, 311, 55). Hence, we divided the answers into two groups: "very low" and "low" formed one group (N=759 observations) and "very high" and "high" comprised the second group (N=366 observations). Responses in the middle of the scale – "medium" – were excluded from the analysis (N=507 observations). To test H1.7 and H1.8 we tested for the significant differences between the beta weights using a Chi-Square test.

RESULTS

Our models explored the impact of EOE characteristics on its output measures. As such, the models examined the impact of the six opportunity characteristics and the three individual characteristics of the entrepreneur on the decision to exploit and on the expected profitability.

We hypothesized that both the decision to exploit an opportunity and the expected profitability will be positive/higher when there is: a. larger industry size, b. lower competition, c. higher technological innovation, d. higher market innovation, e. higher entrepreneur familiarity with the market, and f. lower entrepreneur required commitment. The results of the GENMOD procedure relating to the six opportunity criteria and the individual characteristics are displayed in Tables 1 and 2 for the exploitation and the expected profitability, respectively. Each table contains four models. The first model consists of the six opportunity variables only. Model 2 adds the experience variable to the opportunity variables. Model 3 adds the two personality variables of risk taking and initiative to the opportunity criteria. The fourth model includes all variables representing the opportunity and the entrepreneur experience and personality.

TABLE 1:

Effects of opportunity and individual characteristics on the exploitation decision

Dependent Variable: **Independent Variables:**	**Model 1: Exploitation (Yes-No)**	**Model 2: Exploitation (Yes-No)**	**Model 3: Exploitation (Yes-No)**	**Model 4: Exploitation (Yes-No)**
Intercept	-3.00 ***	-3.34***	-4.69***	-4.54***
A. OPPORTUNITY				
A1. Industry:				
Market size	0.79***	0.80***	0.80***	0.81***
Competition	-0.83***	-0.84***	-0.84***	-0.85***
A2. Innovation:				
Technological	1.45***	1.46***	1.46***	1.47***
Market	1.70***	1.72***	1.71***	1.73***
A3. Entrepreneur:				
Familiarity	1.41***	1.42***	1.43***	1.43***
Commitment	-0.82***	-0.83***	-0.83***	-0.84***
B. ENTREPRENEUR				
B1. Experience				
1st dummy variable		0.58*		0.48*
2nd dummy variable		0.24		0.22
B2. Personality:				
Risk taking			0.18+	0.16
Initiative			0.27+	0.18

For each model: # of observations = 204; Displayed are the beta coefficients.
+ p<0.1; * p<0.05 ; ** p<0.01; *** p<0.001.

TABLE 2:

Effects of opportunity and individual characteristics on profitability assessment

Dependent Variable: **Independent Variables:**	**Model 1:** **Expected Profitability (Binary)**	**Model 2:** **Expected Profitability (Binary)**	**Model 3:** **Expected Profitability (Binary)**	**Model 4:** **Expected Profitability (Binary)**	**Model 5:** **Expected Profitability (5-points scale)**
Intercept	-3.57***	-3.49***	-5.46***	-5.56***	1.259***
A. OPPORTUNITY					
A1. Industry:					
Market size	1.72***	1.72***	1.74***	1.75***	0.56***
Competition	-1.36***	-1.36***	-1.38***	-1.38***	-0.46***
A2. Innovation:					
Technological	1.34***	1.34***	1.35***	1.35***	0.51***
Market	2.13***	2.13***	2.13***	2.14***	0.73***
A3. Entrepreneur:					
Familiarity	1.21***	1.21***	1.22***	1.23***	0.38***
Commitment	0.05	0.05	0.05	0.06	-0.006
B. ENTREPRENEUR					
B1. Experience					
1st dummy variable		-0.12		-0.27	-0.1+
2nd dummy variable		-0.12		-0.18	-0.005
B2. Personality:					
Risk taking			0.34**	0.35***	0.11***
Initiative			0.20	0.25	0.05

For each model: # of observations = 204; Displayed are the beta coefficients.

+ p<0.1; * p<0.05 ; ** p<0.01; *** p<0.001.

Hypotheses H1.1-H1.6 examine the impact of the six characteristics of the opportunity on the two EOE outcome measures and they are represented in Model 1 in both tables. Using HLM the results revealed that almost all the variables had a significant effect in the expected direction on the two outcome variables of exploitation and expected profitability. More specifically, there were positive and significant effects of EOE characteristics of industry size, market and technological innovation and familiarity with the market; industry competition and entrepreneur's commitment had a negative effect. In line with our hypothesis, entrepreneur's commitment to the opportunity had a significant negative effect on the choice to exploit the opportunity, but unlike our hypothesis, it had no significant effect on the expected profitability. To summarize, Hypotheses H1.1 – H1.5 were fully supported, and Hypotheses H1.6 was partially supported: H1.6a was supported, while H1.6b was not supported.

Hypotheses H1.7 and H1.8 explored the impact of the opportunity resource based characteristics versus the market based characteristics on the EOE outcome measures. A Chi-Square test was run to compare each pair of betas. In regard to the *exploitation decision* – the order of the betas (from the largest to the smallest, absolute value) was: market innovation (beta=1.7), technological innovation (beta=1.46), familiarity with the industry (beta=1.41), competition (beta=-0.83), required commitment (beta=-0.82), and industry size (beta=0.8). Between the betas of market and technological innovation and between technological innovation and familiarity with the market, there were no significant differences. Between the betas of market innovation and entrepreneur's familiarity with the target market, there was a marginal significant difference ($p<0.1$). Between the last three betas there were no significant differences, but each of them significantly differed from the first three betas ($p<.0001$). These findings partially support H1.7a (and reject H1.8a) demonstrating that market innovation, technological innovation and entrepreneur's familiarity with the market, which represent the opportunity resource based view, had a stronger impact on the decision to exploit than competition and industry size, which represent the market based view. However, unlike our hypothesis the required commitment, which represents the opportunity resource based view, had no higher impact than the market based view characteristics,

In regard to the *profitability assessment*, the order of the betas (from the largest to the smallest, absolute value) was: market innovation (beta=2.13), market size (beta=1.72), competition (beta=-1.36), technological innovation (beta=1.34), and familiarity with the market (beta=1.21). As indicated before, required commitment was not significant. There were no significant differences between the betas of competition, technological innovation and familiarity with the market. Between the betas of market innovation and market size, and between those of market size and competition, and market size and technological innovation there were marginal significant differences ($p<0.1$). Between the betas of market size and familiarity, and between those of familiarity and required commitment there were significant differences ($p<0.05$, $p<0.01$, respectively). These findings do not support any of our two alternative hypotheses (1.7b, 1.8b).

Hypotheses H2.1 argued for a positive effect of prior experience on both the decision to exploit and the expected profit. We used the GENMOD procedure, adding to the regression equations the experience of the respondents, as it appears in Model 2 in both Tables 1 and 2. In line with H2.1a, experience had a positive and significant ($p<0.05$) impact on the choice to exploit the opportunity, but unlike H2.b, experience had no significant effect on the expected profitability. The impact of the other variables remained the same. A post hoc analysis of the differences among the three levels of experience revealed that there was a significant difference between participants with low and high entrepreneurial experience in their choices to exploit the opportunity ($p<0.05$). Participants with high experience tended to exploit opportunities more than the minimally experienced ones. There was a marginal significant difference between participants with medium and high experience ($p<0.1$). Finally, there was no significant difference between participants with low and medium entrepreneurial experience.

Hypotheses H2.2 and H2.3 examined the direct effects of personality characteristics on the two EOE outcomes. It hypothesized that personal dispositions for risk taking and for initiative will positively influence the exploitation and the expected profitability. First, we calculated the Pearson correlation between the two personality variables and experience; results can be seen at table 3.

TABLE 3:

Correlations between personality variables and experience

		Risk taking	Initiative	Experience
Risk taking	Person Correlation	1.00	-.101	.103
	Sig. (2-tailed)		.152	.141
Initiative	Person Correlation	-.101	1.00	.202
	Sig. (2-tailed)	.152		.000
Experience	Person Correlation	.103	.282	1.00
	Sig. (2-tailed)	.141	.000	

Regarding the exploitation decision – it can be seen from Model 3 that both personality characteristics had a marginal significant influence on the decision to exploit in the expected direction (H2.2a, H2.3a): the higher the level of risk taking and initiative, the higher the probability that he/she will decide to exploit the opportunity. Regarding the expected profitability – it can be seen that only the personality characteristic of risk taking had a positive and significant ($p<0.01$) effect (H2.2a), while initiative had no significant effect (H2.3a).

Model 4 shows the impact of all the variables together. It can be seen that when the opportunity characteristics, experience and the personality characteristics are inserted altogether into the regression equation predicting the exploitation decision (Table 1), the impact of the opportunity characteristics remained the same, while only the experience but not the personality characteristics was significant. These findings suggest that experience mediates the impact of the personality characteristics on the decision to exploit an opportunity. Examination of the expected profitability (Table 2) indicates that putting all the variables together does not change any of the findings described before.

As was explained above, for testing the expected profitability we inverted the 5-point scale into binary scale of "low" and "high", while the middle of the scale – “medium” answers – were excluded from the analysis. In order to assure that the exclusion of these observations didn't change the results dramatically, we run a linear regression for the 5-points scale of the profitability assessment. The results are shown in Model 5, Table 2. It can be seen, that the results of Model 5 and Model 4 are almost the same, except that experience has a marginal significant effect on the expected profitability. Table 4 summarizes the main findings.

TABLE 4:

Summary – Entrepreneurs' Entrepreneurial Opportunity Evaluation (EOE)

Entrepreneur's EOE Outcome: **Entrepreneur's EOE Process:**	**1. Exploitation Decision**	**2. Expected Profit**	**3. Comments**
A. OPPORTUNITY **A1. Industry**: • Market Size • Competition	 Sig. (2) Sig. (2)	 Sig.(2) Sig.(3)	
A2.Product Innovation: • Technology • Market	 Sig. (1) Sig.(1)	 Sig.(3) Sig.(1)	
A3. Entrepreneur: • Familiarity • Commitment	 Sig.(1) Sig.(2)	 Sig.(3) NS	
B. ENTREPRENUER **B1. Experience**:	 Sig.	 NS	p<.1 in the expected profit, 5-point scale
B2. Personality: • Risk taking • Initiative	 Sig. Sig.	 Sig. NS	The personality variables in the exploitation decision are significant only without experience in the equation.

Notes

- **Sig** - Significant
- **NS** – Not Significant
- **Number in parenthesis** – the relative importance in affecting the relevant EOE outcome measures (1 is the highest).

Model Predictability: Hold-Out cases

In order to test our model's predictability we used the full model (no. 4) to predict the answers of the holdout cases. These 816 scenarios (204 subjects * 4 hold-out scenarios per subject) were not used for estimating the model. We compared the prediction of the model with two criteria (random criterion and maximum criterion), to see whether our model predicts better (used for example in: Gilbride & Allenby, 2004). The prediction of the model is the probability to predict the answer that was actually

given (i.e., when the answer to the scenario is zero, we calculate the probability that the model predicts "zero", and when the answer to the scenario is one, we calculate the probability that the model predicts "one"). The average of all these probabilities is 0.72 for the exploitation decision and 0.76 for the profitability assessment. The random criterion we used is the probability to predict the answer correctly using the probabilities of the estimation sample. For the exploitation decision, 30% of the answers were "yes" and 70% were "no". To calculate the probability to predict correctly based on these findings, we multiply the probability to say "no" (0.70) with the probability that the answer is really "no" (0.70) and add the product of the probability to say "yes" (0.30) with the probability that the answer is really "yes" (0.30), and we got the random criterion 0.58. For the profitability evaluation, 32% of the answers were "yes" and 68% were "no", and the random criterion is 0.56. These findings show that the predictability of our model is much better than the random criterion. The maximum criterion, which is stricter, is the probability to be correct when you predict "no" all the time, means for the exploitation decision – 0.70, and for the profitability assessment – 0.68. Using this criterion we see that our model still predicts better, and we conclude that it can be used for predicting decisions of exploitation and evaluations of profitability.

DISCUSSION

The present study is the first to empirically identify the factors affecting the EOE that mediates between the discovery and exploitation phases in the process of entrepreneurship (Shane & Venkataraman, 2000). Using an innovative design of a conjoint analysis, this study enabled us to overcome potential limitations of evaluations, which had proved to be unreliable in previous research (Zacharakis & Meyer, 1998). Furthermore, while most of the previous research (related to VCs) examined only the decision to exploit, and its major argument was that it is difficult to measure the expected profit (Shepherd, 1999; Zacharakis & Meyer, 1998), we expanded the meaning of the opportunity evaluation from the decision to exploit, and included the profit evaluation as well.

The present study leads to two theoretical contributions by shedding light on two existing controversies in the research literature. The first debate concerns the relative effect of personal characteristics versus opportunity characteristics on EOE. While early research on entrepreneurship pointed at the influence of the entrepreneur's personal characteristics on the decision to pursue entrepreneurial activities, recent research has argued that entrepreneurial activity in general, and the decision to found a new firm in particular, is a function of the interaction of enterprising individuals and the characteristics of potentially valuable opportunities (Shane & Venkataraman, 2000; Eckhardt & Shane, 2003; Shane, 2003). The present study enabled us to test the relative contribution of the opportunity characteristics versus the entrepreneur's personal characteristics on two decisions – the decision to exploit the opportunity, and the profit evaluation of the opportunity. Our findings reveal that both opportunity characteristics and individual characteristics impact on the EOE, while the decision of exploitation is more influenced by individual characteristics than the profit evaluation. These findings suggest that previous personality centered studies on the decisions of people to found firms, which do not control for the attributes of the opportunity being evaluated (for example: Khilstrom & Laffont, 1979), are incomplete and may suffer from omitted variable bias.

Three findings show the higher impact of individual characteristics on the exploitation decision versus the profit evaluation. *First*, prior experience in entrepreneurial activities positively affects the exploitation decision, but does not have an impact on the profitability evaluation. The impact on the exploitation decision is consistent with previous research that found that prior career experiences affect the likelihood that an invention will be commercialized through the founding of a new organization (Shane & Khurana, 2003). *Second*, the personality characteristic of initiative impacts on the exploitation decision but not on the profitability assessment. This difference can be understood due to the characteristic of initiative's propensity that it is goal and action oriented (Frese et al., 1996). The exploitation decision is action oriented, while the evaluation of the potential profitability is not. *Third*, out of the six opportunity characteristics, the required commitment of the entrepreneur, which is related both to the opportunity and to the individual characteristics, is the only one, which impacts only on the exploitation decision but not on the expected profitability.

The second controversy pertains to the relative importance of the resource-based view versus the market-based view, in explaining the EOE outcomes. The present study demonstrated that the resource-based view is more effective in explaining the exploitation decision, while there is no unequivocal evidence regarding the expected profit evaluation. Thus, the two approaches effectively contributes to the decision making process in different contexts – the RBV is more influential in the early stage of founding a company, when the internal resources serve as the building blocks of a successful start-up company; In more advanced stages in the company's life cycle, when the external resources could facilitate or hinder the firm's success, both RBV and MBV found to be influential. Hence, the present study brings a new insight toward resolving the debate over the relative importance of the resource (Barney, 1991) versus market (Porter, 1980) based view, especially in the exploitation decision stage.

As stated before, we found differences in the factors affecting the two EOE outcomes. One explanation of these differences can be attributed to the different motivation of entrepreneurs versus VCs. The decision to exploit represents the motivation of the entrepreneur to promote a creative idea and turn it into a product by establishing a new venture. On the other hand, profit considerations reflect the motivation of the VC to

gain a return on investment, and therefore, it influences their decision to invest in the new venture. For this reason, it might be that the motivation of the entrepreneur is based on his perceived internal resources, and his personality tendencies, while the motivation of the VC is based on the evaluation of the contextual conditions, which influence his/her return on investment, as well as the contribution of the internal resources. Thus, entrepreneurs are promotion oriented, disregarding external conditions that may deter their profit. In contrast, VCs are more prevention oriented, and given the internal resources; they want to prevent profit loss that may be caused by the market conditions.

To further support the above argument we examined the research on VCs' evaluations. Hall and Hofer (1993) tested for the criteria VCs use when making an investment decision. They showed the VCs business protocols, and asked them to "think aloud" when they evaluate them, and make go/no go decisions. Hall and Hofer's research findings showed that VCs place little importance on the skill or experience of the entrepreneur or entrepreneurial team in their decisions. However, other research obtained contradictory findings, showing that VCs place higher importance on the entrepreneur's characteristics than on the opportunity/industry characteristics (Macmillan, Siegel & Narasimha, 1985; Shepherd, 1999). This finding demonstrated that both market based view and resource based view are important in VCs' evaluation, and their evaluation is similar to the entrepreneur's evaluation of the expected profit.

Limitations

We used conjoint analysis in this study because it accounts for a number of biases and errors, as we explained above, but the technique itself has limitations. One such issue is the use of hypothetical opportunities, which might damage the external validity. However, research into a variety of judgments provides evidence that hypothetical representations are useful for capturing real policies (Riquelme & Rickards, 1992).

One aspect of the study that might weaken the external validity is the fact that the experiment forced the participants to make decisions based upon the six-presented criteria. In reality, entrepreneurs have access to a multitude of possible information cues, and they use different methods to clarify and assess reliability of the chosen cues.

Another limitation of this study is that we were unable to measure the direct trade-off between attributes in a quantitative sense. We needed to use "high/low" values for the criteria to encompass a variety of opportunities that vary in size and type. Therefore, what we captured in our study were the effects and trade-offs between attributes, namely what attributes were more important relative to others, rather than a quantitative measure of the trade-off between the attributes. Moreover, measuring the trade-off effects between variables using unspecified units might suffer from low external validity

There may also be questions regarding the ability to generalize the results, given that the sample included only academic members. Even if the results of this study can be generalized only to academic entrepreneurs, we think that relating to this population is very important because academic organizations have a great potential for new ideas and inventions (Mowery & Shane, 2002). Based on this potential we chose to use academic faculty members as our research population**.**

Future Research

The present research touches upon the controversy over the relative effect of the resource-based view versus the market based view. The present study suggests that the two models may have a differential effect in different situations. To further examine this hypothesis we propose that future research should be conducted on VCs, using the same tool. This will allow us to test for the differential centrality of the two models for entrepreneurs and VCs.

From a methodological perspective future research should use specific values of the attributes rather than simply high/low. This will allow measuring of the direct trade-off between attributes in a quantitative way. In addition, the same study can be done in non-academic populations of entrepreneurs, thereby enabling use to determine if our results can be generalized.

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Appendix A: An example for a conjoint profile (scenario)

Market Size	Big
Competition	Low
Technological Innovation	Low
Market Innovation	High
Required Commitment	High
Familiarity with the Target Market	Low

Working and Position Papers

1) Lach, S., "Do R&D Subsidies Stimulate or Displace Private R&D? Evidence from Israel", Science, Technology and the Economy Program (STE) – Working Papers Series, March 2001.

2) Trajtenberg, M., "R&D Policy in Israel: An Overview and Reassessment", Science, Technology and the Economy Program (STE) – Working Papers Series, March 2001.

3) Lichtenberg, F. R., "Sources of U.S. Longevity Increase, 1960-1997", Science, Technology and the Economy Program (STE) - Working Papers Series, November 2000.

4) Peled, D., "Defense R&D and Economic Growth in Israel: A Research Agenda", Science, Technology and the Economy Program (STE) - Working Papers Series, March 2001.

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7) Lach, S. and Sauer, R.M., "R&D, Subsidies and Productivity", Science, Technology and the Economy Program (STE) - Working Papers Series, September 2001.

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16) Bental, B. and D. Peled, “Quantitative Growth Effects of Subsidies in a Search Theoretic R&D Model”, Science, Technology and the Economy Program (STE) - Working Papers Series, October 2002.

17) Dan Galai and Zvi Wiener, “A Micro-Economic Approach to Government Support of R&D Investments in the Private Sector”,

Science, Technology and the Economy Program (STE) - Working Papers Series, November 2002.

18) Lach S., Schankerman M., “Incentives and Invention in Universities”, Science, Technology and The Economy Program (STE) Working Papers Series STE-WP-18-2003, May 2003.

19) Miron E., Erez M., Naveh E., "Do Personal Characteristics and Cultural Values that Promote Innovation, Quality, and Efficiency Compete or Complement Each Other?", Science, Technology and The Economy Program (STE) Working Papers Series STE-WP-19-2003, June 2003.

20) Avnimelech, Gil and Morris Teubal, “Evolutionary Venture Capital Policies: Insights from a Product Life Cycle Analysis of Israel’s Venture Capital Industry”, Science, Technology and The Economy Program (STE) Working Papers Series STE-WP-20-2003, November 2003.

21) Breznitz, Dan, "Innovation and the Limits of State's Power: R&D and Industrial Policy in Taiwan in IC Design and Software", Science, Technology and The Economy Program (STE) Working Papers Series STE-WP-21-2004, April 2004.

22) Cohen-Goldner, Sarit and Zvi Eckstein, "Immigrants in the Hi-Tech Sector: Comparison to Natives and the Effect of Training", Science, Technology and The Economy Program (STE) Working Papers Series STE-WP-22-2004, October 2004.

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24) Jonathan Menuhin and Niron Hashai, "Firm Growth Profiles (FGPs): Towards an Action-Based View of Firm Development", Science, Technology and The Economy Program (STE) Working Papers Series STE-WP-24-2005, January 2005.

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28) Breznitz, Shiri, "From Ivory Tower to Industrial Promotion: The Case of Yale University and the Biotechnology Cluster in New Haven, Connecticut", Science, Technology and The Economy Program (STE) Working Papers Series STE-WP-28-2005, May 2005.

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30) Feigenbaum, Avi, Scott Shane, Miriam Erez, Oshrat Kremer Srabstein and Moshe Givon, " What Affects Technion Faculty Members' Decision to Found a Start-Up Firm? Effects of the Business Opportunity and the Entrepreneur's (faculty) Personal

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Prof. Avi Fiegenbaum, head of the strategic management area and former Associate Dean for the MBA programs. In 2003, his book Global Competitive Strategy (in Hebrew) was published by the Open University. Prof. Fiegenbaum was an owner-partner in Ofer Technologies, where he served as Chairman of the Board of technological incubators and hi-tech start-ups.

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Prof. Miriam Erez is the Mendes France Chaired Professor of Management and Economics. Her research focuses on three major topics: work motivation, innovation, and cross-cultural organizational behavior. She published two books and three edited books in these areas, in addition to numerous articles and book chapters. Erez is Fellow of The Society for Industrial and Organizational Psychology, of The American Psychological Association, and of The Academy of Management. In 2005 she received the Israel Prize in Management Sciences.

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