

Toward a Sustainable Conceptualization of Dependent Variables in Entrepreneurship Research

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ABSTRACT

Entrepreneurship researchers have yet to explore the full range variance that occurs in entrepreneurial value creation because we have focused almost exclusively on financial performance as the dependent variable in our research. However, such arbitrary narrowness is not supported by research, which shows entrepreneurs to not focus exclusively on income maximization. Consistent with calls for an expanded view of the consequences of entrepreneurship, we develop a typology of entrepreneurship dependent variables that supports broadening the scope of entrepreneurship research to include economic, environmental and social value. Copyright © 2006 John Wiley & Sons, Ltd and ERP Environment.

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Introduction

DEPENDENT VARIABLES SELECTED BY SCHOLARS FOR USE IN ENTREPRENEURSHIP RESEARCH HAVE focused on only part of the range of possible outcomes from new venture value creation strategies. Entrepreneurship researchers have thus been limited in their explanations of the full range variance that occurs in entrepreneurial value creation. In apparent disregard of important calls for an expansion of the dependent variable in entrepreneurship research (e.g. Venkataraman, 1997), and notwithstanding empirical findings showing other strong value motives (e.g. Amit *et al.*, 2000), entrepreneurship research largely continues to pursue financial performance as its primary dependent variable, based on the somewhat narrow assumption that the motive for value creation is almost entirely restricted to profit maximization.

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To help address this limitation we develop in this paper a typology of entrepreneurship dependent variables that broadens the scope of entrepreneurship research to include economic, environmental and social value. Such expansion is possible because it is generally accepted that human beings seek value across a fairly wide spectrum that includes: social value (creating beneficial relationships), economic value (increasing wealth) and environmental value (ensuring perpetuity in the natural environment) (Jensen and Meckling, 1994). This is consistent with the notion of the triple bottom line (see, e.g., Hart and Milstein, 2003; Elkington, 1997). Thus, by creating a broader typology of dependent variables we map the broader territory of relevant outcomes available for consideration in entrepreneurship research and provide direction for expansion of the dependent variable range as envisioned by Venkataraman (1997).

The paper proceeds as follows. After reviewing the extant literature regarding value motivations, we propose a wider-scope typology of entrepreneurship value creation. The possible operationalization of each component of the typology for entrepreneurship research is then discussed. Following this we summarize our scan of dependent variables used in empirical research published in the *Journal of Business Venturing* (Elsevier) according to the proposed typology in an attempt to demonstrate the essence of the pattern of dependent variable choices that has mainly been utilized in our research since the publication of Venkataraman's suggested domain statement. We conclude by exploring how the proposed typology could serve to guide future entrepreneurship research by helping researchers to select a broader range of possible outcomes from new venture value creation strategies.

Literature Review

A Broader Concept of Value Creation

We argue that the field of entrepreneurship can benefit from a more holistic/comprehensive view of value creation. Others, too, have argued for an expanded view of entrepreneurship beyond firm performance, although along different dimensions than the ones we ultimately have selected for our analysis herein. For example, Filley and Aldag (1978) were among the first to incorporate entrepreneurial motivations into an entrepreneurial typology, introducing into the literature the entrepreneurial categories of craftsman, entrepreneur and professional, and suggesting that each of the categories were associated with distinct objectives such as comfort, accomplishment and market adaptation, respectively. Along other dimensions, Low and MacMillan (1988) argue for both a micro and macro view of the economic impact of entrepreneurship, which could consider not only firm performance, but return on investment for the founder and early investors, as well as the macro-economic impact of entrepreneurship. Recently, the macro-economic impacts of entrepreneurial activity have been theoretically explored by several authors (e.g. McGrath, 1999; Acs, 1992; Acs and Armington, 2002). We further note that we have seen very few empirical studies demonstrating the link between entrepreneurial activity and macroeconomic growth. Going back a bit further in history, Schumpeter (1911) was among the first to express an appreciation for the role that cumulative entrepreneurial activity plays in economic development and the creation of new industries (and destruction of others).

Venkataraman (1997, p. 121) also argues for such broader-spectrum features in the domain of entrepreneurship research. We have adopted his proposed definition of the distinctive domain of entrepreneurship research (1997, p. 120) – as only slightly adapted by Cohen and Winn (2006). Under this concept, entrepreneurship research is concerned with discovering

... (1) why, when and how opportunities for the creation of goods and services in the future arise in an economy; (2) why, when, and how some are able to discover and exploit these opportunities

while others cannot or do not; and finally (3) what are the economic, psychological, social *and environmental* (added) impacts of this pursuit of a future market not only for the pursuer but also for the other stakeholders and for society as a whole.

Helpfully, Cohen and Winn (2006) also provide rationale supporting a broad-spectrum view of value creation, suggesting that the underlying disequilibrium that creates the economic imperfections that lead to opportunity in a market has counterparts within the social and environmental domains. Using this logic it is possible to extend the idea of entrepreneurial–economic value creation to include entrepreneurial–social and entrepreneurial–environmental value creation. Thus, as we sought to create a more comprehensive basis for the generation of a wider range of dependent variables in entrepreneurship research, we relied upon logic that can suggest possible variables using a value–motives link.

Recently research has attempted to empirically uncover the motivations of founders operating in different contexts. For example, Amit *et al.* (2000) investigated founding motivations among high technology entrepreneurs and found that wealth attainment was not the most salient motivation for venturing (Amit *et al.*, 2000). Motivators found to be more salient in the decision to venture included (Amit *et al.*, 2000) ‘lifestyle’ and ‘contribution’. The lifestyle motivator was defined as (Amit *et al.*, 2000, p. 143) ‘accommodating dual career situations, spending time with family, in recreational opportunities, living where you want, having fun, and being healthy’. The contribution motivator was defined as (Amit *et al.*, 2000, p. 143) ‘helping others, making a difference to your organization, community, industry and creating opportunities’. Furthermore, Cooper and Art (1995) found that entrepreneurial satisfaction is higher, even after controlling for firm financial performance, among entrepreneurs who emphasize non-economic goals.

It therefore seems logical to suggest that the motivations of founding entrepreneurs will probably reflect both their value creation strategies and the criteria by which they (and others) can evaluate the outcomes of those strategies. Some have demonstrated a link (e.g. Cooper and Art, 1995; Stuart and Abetti, 1990) while others (e.g. Fischer *et al.*, 1993) have not. Robichaud *et al.* (2001) suggest that explanations for these results are due to a pure focus by some researchers on objective financial criteria rather than a holistic view of entrepreneurial motivation, which probably goes beyond purely financial objectives.

If entrepreneurs are commonly motivated by factors beyond firm financial performance, then they may probably evaluate their performance against a number of criteria, supporting our thesis that financial performance may be only one important piece of performance measurement (Cooper and Art, 1995). Because money is neither the only, nor often the most important goal for many entrepreneurs, a dependent variable encompassing multiple potential objectives for founders is necessary (Douglas and Shepherd, 2000; Amit *et al.*, 2000). The following discussion will present a typology of entrepreneurial value creation encompassing, not only financial performance, but performance that reflects social and environmental value as well.

A Typology of Entrepreneurship Value Creation

A key assumption in the entrepreneurship literature, that the pursuit of entrepreneurial rents is the primary driver for aspiring entrepreneurs, has resulted in the unfortunate exclusion of other drivers and impacts of the entrepreneurial phenomenon (Amit *et al.*, 2000). Jensen and Meckling (1994) present five distinct models of human behavior-leveraging utility-maximization theories and conclude that humans are predominately categorized as being in the resourceful, evaluative, maximizing model (REMM). In the REMM model, human beings are viewed to care about many things (e.g. knowledge, the well-being of others, wealth, the environment); have unlimited wants; are value maximizers and are

resourceful. Jensen and Meckling (1994) suggest that individuals seek to maximize their utility function across multiple dimensions with financial wealth being only one. While we acknowledge that bounded rationality poses challenges for entrepreneurs in a model requiring the maximization of economic and extra-economic objectives, we suggest that entrepreneurs probably operate under the REMM model, and therefore may be expected to do their best to maximize their economic, social and environmental objectives.

Because entrepreneurial motivation plays a fundamental role in the new venture creation process (Herron and Sapienza, 1992), a model that accurately depicts the role of founding entrepreneurs on new venture performance must include the motivations of the founder (Herron and Robinson, 1993). We argue that the triple bottom line presents a useful foundation for a discussion of the balancing of multiple wants desired by entrepreneurs, and needed in society. Proponents of the triple bottom line suggest that for the sustainability of current and future generations economic development must occur in a way (WCED, 1987) 'that meets the needs of the present without compromising the ability of future generations to meet their own needs'. While we acknowledge that management and economic research has long suggested that maximizing profit is at odds with any social or environmental values (Chrisman and Carroll, 1984; Cohen and Winn, 2006), there is a growing understanding that a synergistic relationship exists among the pursuit of social and environmental objectives and profitability.

The typology of entrepreneurial value creation depicted in Figure 1 reflects the concept of the triple bottom line, where the economic, social and environmental motives of entrepreneurs define not only seven sets of entrepreneurial motivations and associated objectives (plus one null set to allow for the possibility that the proposed model is not exhaustive of all possible dependent variables), but also seven sets or domains of entrepreneurial value creation (or performance metrics) that could be used to assess

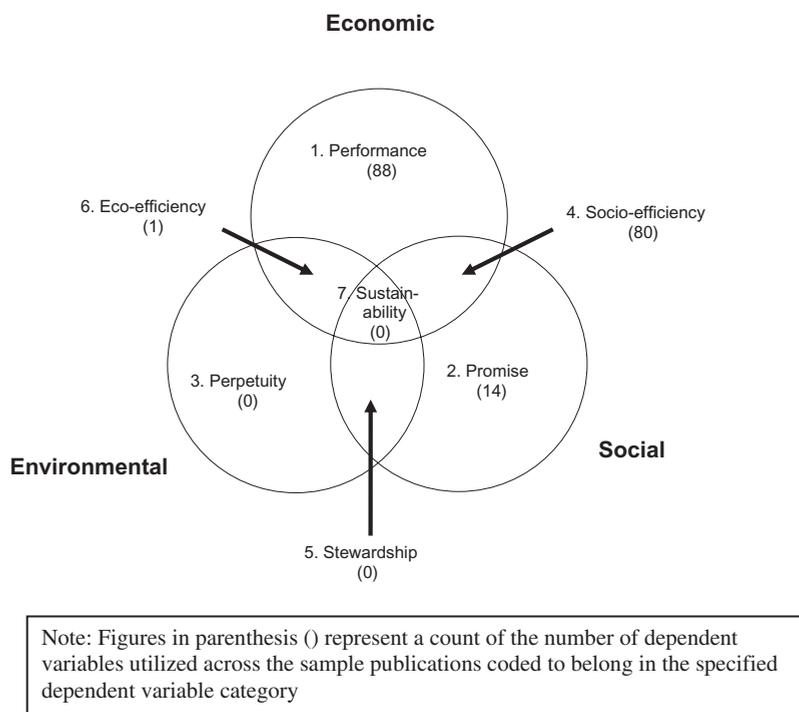


Figure 1. Broad-scope entrepreneurship value creation

whether these objectives have been achieved. Establishing metrics to reflect the triple bottom line is an important and necessary step for scholars and also to provide normative guidance to practitioners (Dyllick and Hockerts, 2002). Thus, we conceptualize the domain of the dependent variables of entrepreneurship research as being concerned with economic performance (achievement of economic objectives), promise (achievement of social objectives) and perpetuity (achievement of environmental objectives), as well as socio-efficiency (achievement of socio-economic objectives), stewardship (achievement of socio-environmental objectives), eco-efficiency (achievement of enviro-economic objectives) and sustainability (achievement of socio-enviro-economic objectives).

Below we discuss each component of our typology and provide illustrative examples of dependent variables that are part of the set of metrics associated with each value creation objective. Adopting the distinctions between inputs, processes, outputs and outcomes in the performance measurement literature (e.g. Behn, 2003) and social performance literature (e.g. Wood, 1991; Agle and Kelley, 2001), we present in Table 1 illustrative examples of the process, output (activity) and outcome (impact) variables that either have been the focus of entrepreneurship research, or could be the focus of future entrepreneurship research (input variables are considered part of the null set as they are not indicators of value creation). While our illustrative examples are certainly not exhaustive, we believe that the typology could capture most of the dependent variables of interest in entrepreneurship research. It does not, however, capture dependent variables associated with the achievement of political objectives – as specified in the balanced concept of the firm by Enderle and Tavis (1998). We first identify and describe the three primary components of the triple bottom line and follow with a more detailed description and provide illustrative new venture examples of each of the overlapping elements of the model (Figure 1). These new venture examples were chosen to illustrate firms whose primary value creation strategies and focal positioning are consistent with the intersections in the value typology. We note, however, that most firms have complex, or multidimensional, value creation strategies whose elements may reflect, at least in part, multiple value domains in the typology and they may measure their own performance using dependent variables associated with these multiple value domains (reflected in Table 1).

1. *Performance*. Economic performance is concerned with achievement of economic objectives. The economic orientation in management and entrepreneurship research is pervasive (Davidsson and Wiklund, 2001). The inherent assumption in most of the entrepreneurship research in the group of articles that we reviewed appears to indicate that entrepreneurs are primarily, if not exclusively, concerned with financial wealth creation (Amit *et al.*, 2000); and this is indicated in the dependent variables selected in the research. These variables (Table 1) represent traditional financial measures across the three distinct categories. Process variables for performance include employee productivity measures; output variables include financial performance measures such as cash flow and retained earnings and outcome variables include profit, stock price and return on sales.

While the main emphasis appears to have been placed on purely financial dependent variables, exploring macro-level impacts of entrepreneurship's economic value creation is among the least researched areas of entrepreneurship (Low and MacMillan, 1988; Aldrich, 1999). Only recently have researchers begun to explore the relationships between entrepreneurship activity and its impact on national economies (e.g. McGrath, 1999; Acs, 1992; Acs and Armington, 2002). The Global Entrepreneurship Monitor (GEM) is an international (across 40 countries) longitudinal research project that is beginning to produce results in its efforts to understand how national characteristics such as culture affect total entrepreneurship activity (TEA), and how TEA affects economic growth (Reynolds *et al.*, 2004). There is still much to learn in this respect, one reason being that it is very difficult to isolate the net impact of entrepreneurial activity in a country while controlling for all of the other influences on an economy (Davidsson and Wiklund, 2001).

<p>1. Performance</p> <p>Processes</p> <ul style="list-style-type: none"> Employee productivity Operational efficiency Economic risk management Team decision making process <p>Outputs (activities)</p> <ul style="list-style-type: none"> Cash flow, dividends Supply contracts, royalties Production levels, intellectual property applications <p>Outcomes (impacts)</p> <ul style="list-style-type: none"> Profit, return, stock price, valuation Survival, competitive advantage Assets controlled, knowledge 	<p>Outcomes (impacts)</p> <ul style="list-style-type: none"> Sales, market share, customers Employees, employee development Satisfaction, loyalty, commitment Venture creation decision
<p>2. Promise</p> <p>Processes</p> <ul style="list-style-type: none"> Reporting, marketing communication Public relations <p>Outputs (activities)</p> <ul style="list-style-type: none"> Stakeholder involvement Stakeholder interactions Legislation, law suits, philanthropy <p>Outcomes (impacts)</p> <ul style="list-style-type: none"> Image/reputation, brand equity Social legitimacy 	<p>5. Stewardship</p> <p>Processes</p> <ul style="list-style-type: none"> Environmental planning, reporting, Environmental public relations <p>Outputs (activities)</p> <ul style="list-style-type: none"> Consumer education, reducing waste Recycling, re-use Environmental charity contributions <p>Outcomes (impacts)</p> <ul style="list-style-type: none"> Env. reinvestment, improvements Environmental protection Meaningful employment Quality of work life, recognition
<p>3. Perpetuity</p> <p>Processes</p> <ul style="list-style-type: none"> Life cycle assessment (LCA) Design for environment (DFE) Environmental auditing <p>Outputs (activities)</p> <ul style="list-style-type: none"> Environmental management ISO 14001 Waste management Restoration <p>Outcomes (impacts)</p> <ul style="list-style-type: none"> Pollution, emissions 	<p>6. Eco-efficiency</p> <p>Processes</p> <ul style="list-style-type: none"> Materials use Energy management Environmental risk management Green procurement <p>Outputs (activities)</p> <ul style="list-style-type: none"> Cleaner production, green packaging Production resource efficiency Green product development <p>Outcomes (impacts)</p> <ul style="list-style-type: none"> Selection by socially responsible investment (SRI) funds, reduced costs Stability/longevity
<p>4. Socio-efficiency</p> <p>Processes</p> <ul style="list-style-type: none"> Service quality, relationship Quality, trust, cooperation, market orientation Strategic planning, governance <p>Outputs (activities)</p> <ul style="list-style-type: none"> Market entry/exit; market penetration Number of alliances/relationships Customer retention, product mix Harvest/exit readiness 	<p>7. Sustainability</p> <p>Processes</p> <ul style="list-style-type: none"> First order strategic planning Ethical decision making <p>Outputs (activities)</p> <ul style="list-style-type: none"> Sustainable innovation Sustainable development Creation of new sustainable industries <p>Outcomes (impacts)</p> <ul style="list-style-type: none"> First order competitive advantage Market effectiveness Employee satisfaction/commitment Increased quality of life Customer loyalty, species survival

Table 1. Illustrative dependent variables

2. *Promise*. Promise motivated performance is concerned with achievement of social objectives. Recently there has been an increased effort in the business literature to explore the broader role of business in society. This has been partly brought on by several scandals in recent years involving unethical business practices (e.g. Enron, Arthur Andersen, Martha Stewart, WorldCom and Tyco). The movement to include social performance has been referred to as the corporate social responsibility (CSR) movement. While a formal, uniform definition of CSR has not been developed (Pinkston and Carroll, 1996; Snider, Hill and Martin, 2003), CSR has been described as 'the obligation of the firm to use its resources in ways to benefit society, through committed participation as a member of society, taking into account the society at large and improving welfare of society at large independent of direct gains of the company' (Kok *et al.*, 2001, p. 288).

According to the results of our review, little has been published with respect to the social performance of entrepreneurial ventures. While some authors consider that there has been only a marginal effort to capture social level effects in entrepreneurship research (e.g. Davidsson and Wiklund, 2001), within the past few years there has been a growth in the study of social entrepreneurship (Gillian *et al.*, 2003; Zietlow, 2001). Social entrepreneurship to date has been primarily concerned with how individuals operating in a nonprofit context innovate to create social value for their constituents (Gillian *et al.*, 2003). This restriction of the social entrepreneurship construct to the non-profit sector may help to explain why social dimensions have not been introduced into the mainstream entrepreneurship literature despite the calls for such (e.g. Venkataraman, 1997).

Prior research has identified four distinct components of CSR (Carroll, 1999): economic, legal, ethical and philanthropic. We have proposed dependent variables along these lines (Table 1). Process variables for promise value creation include social reporting; output variables include stakeholder involvement measures and outcome variables include social legitimacy.

3. *Perpetuity*. Perpetuity-based performance can be seen in the achievement of environmental objectives. In the last decade in particular, business has increasingly taken on the mandate advocated by policy makers and environmental interest groups to improve or 'green' their environmental performance. The result is a plethora of corporate environmental and sustainability initiatives, programs and management systems, that is fueling a growing body of scholarly research on 'corporate greening'. This diverse, multi-disciplinary field examines the institutional contexts, antecedents, processes and economic and ecological consequences of firms' environmental strategies, and has, in its short history, generated important results. As Jensen and Meckling (1994) state when referring to individuals as viewed through the resourceful, evaluative, maximizing model (REMM),

The challenge for our society, and for all organizations in it, is to establish rules of the game and educational procedures that tap and direct the creative energy of REMMs in ways that increase the effective use of our scarce resources (Jensen and Meckling, 1994, p. 17).

A focus on effective use, and specifically upon use that supports environmental vitality in perpetuity, is therefore a key value creation objective: one that in many respects requires a humanity-wide reversal of certain perpetuity-destructive practices. Today, for example, there is growing consensus in the scientific community that climate change is accelerated by collective human activity (Bolin, 1997; IPCC 2001). Industry and globalization have been charged with environmental degradation (e.g. protests at the 1999 WTO meetings in Seattle). While industry's potential to weaken the natural environment is difficult to deny, industry also clearly has the capacity to minimize its negative impact; more importantly, industry may have the potential to reverse negative environmental trends by leading the world into the 'next industrial revolution' (Hawken *et al.*, 1999; Senge and Carstedt, 2001; Braungart and McDonough,

2002). It appears to us that entrepreneurial possibilities exist in this effort if the insights of Cohen and Winn (2006) are extrapolated to suggest that there is currently much value-creating opportunity that exists, but has not been captured within entrepreneurship research.¹ They suggest that

Market economies, unlike their economic models, do not always lead to perfectly efficient allocation of goods and services. Rather, when any of the conditions for perfect markets (e.g., consumers and producers are price-takers; complete present and future markets exist; complete, perfect information exists, and externalities are absent), is violated, markets do not operate efficiently (Venkataraman, 1997; Yao, 1988). Many of the environmental challenges faced today can be attributed to four types of market imperfections, or violations of perfect market assumptions: 1) firms are not perfectly efficient; 2) externalities exist, 3) information is not perfectly distributed; and 4) pricing mechanisms work imperfectly. Each of these market imperfections creates entrepreneurial opportunities, which, if identified and exploited, create entrepreneurial rents for the innovating firms, improve market performance, and introduce more sustainable interactions with the natural environment (Cohen and Winn, 2006).

Dependent variables that could be used for assessing perpetuity-based value creation in entrepreneurship include (Table 1) the use of life cycle assessment (LCA), engagement in ISO 14001 certification and the reduction of pollutions and emissions.

4. *Socio-efficiency (performance–promise)*. At the intersection of an economic and a social orientation is ‘socio-efficiency,’ where value is created through achievement of socio-economic objectives (Dyllick and Hockerts, 2002). All firms, entrepreneurial, small businesses, multinationals, interact regularly with various stakeholders such as customers, employees, suppliers, alliance partners, communities etc. Thus foresighted managers appreciate that firms are socio-economic instruments as opposed to purely financial instruments (Ansoff, 1979). Interestingly, even Adam Smith recognized that social responsibility and profitability were related (Keim, 1978).

Management researchers as early as the 1970s began to recognize the need to advance theory and provide guidance to practitioners in identifying opportunities to be socially responsible and profitable at the same time. Entrepreneurs seeking a socio-efficiency orientation seek financial gain while having a positive impact on individuals in local, regional and or global communities. For example, New Harvest Coffee in Rhode Island sells fair-trade coffee. The idea behind fair-trade coffee is that farmers, largely in developing and undeveloped countries, have found that large coffee bean buyers have been squeezing margins to the point that many farmers can not afford to support themselves and their family and eventually have to exit the industry. Thus fair-trade coffee distributors such as New Harvest agree to pay a price for the coffee beans that is ‘fair’ and enables the farmers to stay in business and support their families. In a socio-efficiency-based performance sense, New Harvest has an orientation toward creating social value but is simultaneously seeking to produce economic value.

Many variables currently used in entrepreneurship and strategic management research intended to operationalize firm performance are reflective of socio-efficiency. For example, while profit is an appropriate performance measure, sales growth as a measure of performance is unique (Kirchoff, 1979) in that it involves the successful strengthening of the relationship with customers. Durand and Coeurderoy (2001) and Lee and Miller (1996) also demonstrate an appreciation for the need to expand performance

¹While the relationship between entrepreneurship and the environment has not yet been explored in depth, there have nevertheless been a few recent attempts to build knowledge in this area. These include a book entitled *Small and Medium-Sized Enterprises and the Environment* (Hillary, 2000) and a special 2002 issue of *Greening Management International* devoted to entrepreneurship and the environment.

measurement to include measures that reflect the creation of broader-scope value. Service quality, market performance and employee improvement can all be used to measure socio-efficient value creation (Table 1).

5. *Stewardship (promise–perpetuity)*. At the intersection of social and environment is ‘stewardship’ value creation, which is defined as achievement of socio-environmental objectives. Under this definition, stewardship entrepreneurs are not motivated for financial reasons. Accordingly, stewardship value creation-based entrepreneurs are more likely to feel a responsibility for both people and their environment, to seek to create value that improves the lives of people and that addresses environmental challenges in their communities. The organizations they create are therefore likely to be charities or non-profits. One example of a stewardship-motivated firm is Social Venture Partners (SVP). Social Venture Partners, launched in 1997, is a *non-profit* venture capital organization in Seattle devoted to supporting and funding socially and environmentally oriented new ventures. To date, SVP has contributed more than \$6 million to target ventures in their community (please see www.svpseattle.org).

Dependent variables that can be used to measure stewardship value creation include (Table 1) level of environmental reporting, consumer education and reinvestment in the natural environment (Hawken *et al.*, 1999).

6. *Eco-efficiency (perpetuity–performance)*. At the intersection of environment and economic occurs ‘eco-efficiency’ value creation, which is defined to be the achievement of enviro-economic objectives (Dyllick and Hockerts, 2002). Referred to as ‘ecopreneurs’ (Schaper, 2002), eco-efficiency-motivated entrepreneurs create value while seeking financial gain through the development of solutions that reduce environmental problems. Evidence is building that there is a significant need (and opportunity) to consider the environment as a critical stakeholder in business practice, and that entrepreneurs are beginning to identify and exploit the opportunities (Hart and Christensen, 2002; Murphy, 2003; Cohen and Winn, 2006) that arise from the outdated take–make–waste production systems (Hawken *et al.*, 1999) and short-term profit maximization orientation (Chrisman and Carroll, 1984).

Eco-efficiency-motivated entrepreneurship encompasses a wider field of phenomena than has previously been considered to be a part of the entrepreneurial domain. Thus, despite the growing scholarly interest in corporate greening, entrepreneurship research has yet to capture the value created where new ventures and entrepreneurially minded firms reshape industry’s approach to eco-efficiency: which achieves economic goals while also achieving environmental performance, e.g., identifying substitutions for damaging environmental processes and products and introducing innovative solutions to address environmentally degrading market imperfections (see, e.g., Cohen and Winn, 2006).

For example, in 1992, Paul Farrow and Dale Vetter founded Walden Paddlers, a firm designed to create innovative kayaks utilizing largely recycled plastics. One of their primary objectives was to ‘divert waste from the landfills of our towns by making it into high quality, high value, useful, reusable/recyclable products’ (Larson, 1997, p. 9). According to company sources, Walden Paddlers has thus far managed to divert more than 600 tons of plastic from the landfills through the end of 2003: a tangible example of eco-efficiency motivation in action. Variables that can be used to measure eco-efficient value creation include (Table 1) materials use and ecoefficiency methods (Greenberg and Unger, 1992), and environmental outcomes such as cost-reduction (Iwanowski and Rushmore, 1994).

7. *Sustainability (performance–promise–perpetuity)*. At the intersection of all three components of the triple bottom line lies ‘sustainability’ value creation: the achievement of socio-enviro-economic objectives. Depending upon circumstances, sustainability-motivated entrepreneurs seek to maximize, balance and/or optimize economic, social and environmental value creation. One main theme continues to

emerge in our analysis: a purely economic view of entrepreneurship (whether it be at the individual, firm, or economic level of analysis) is still devoid of a holistic interpretation of the true nature of entrepreneurial activity. Accordingly, this analysis, in seeking to explore the application of the triple bottom line to the field of entrepreneurship research has been able to define a broader-scope set of possible dependent variables so that outcome comparisons and analysis in entrepreneurship research can be achieved. The systematic specification, therefore, of broad-spectrum dependent variables that are rooted in sustainability motivation accomplishes, in part, this objective.

One example of broad-spectrum sustainability-motivated entrepreneurship is Iowa Thin Film Technologies, which has developed a solar photovoltaic cell based on a modified, low-end semiconductor circuit that they seek to sell in developing countries where reliable power is not available (Hart and Christensen, 2002). Beyond reducing the environmental impact through the use of renewable energy sources, this firm may contribute to increasing the quality of life for its target clientele such that, for example, children will be able to read and study at night. By also meeting their economic objectives and responsibilities to shareholders, Iowa Thin Film Technologies provides a living example of the kind of sustainability-based value and triple-bottom-line motivation resulting in broad-spectrum performance.

Measures to assess sustainable value creation entrepreneurship reflect first order optimization (see, e.g., Williamson, 1991) concepts – that is, they are concerned with the achievement of high-level socio-enviro-economic objectives where focus on economic, social and environmental objectives singly or in dyads may produce suboptimal long-term outcomes. We envision possible dependent variables to include, for example, level of ethical decision making (see, e.g., Stainer and Stainer, 1997), sustainable innovation (see, e.g., Larson, 2000), sustainable development (Springett, 2003), market effectiveness and customer loyalty (see, e.g., Stainer and Stainer, 1996) and/ or increased quality of life (see, e.g., Pennings, 1982). Because sustainability-motivated performance involves first-order optimization decisions that satisfy all three competing value motives, it is difficult to achieve. For example, it may require entrepreneurs or their organizations to relax more traditional second-order measures of performance, or it may result in ‘underperformance’, from the narrower economic-value-only focused viewpoint. Because entrepreneurs are in a better position to focus on first order objectives than are managers (who are more accountable to others focused on second-order objectives), this also suggests that the sustainability-motivated value creation movement is likely to be led by entrepreneurs.

Empirical Analysis

To understand where in our typology the focus of entrepreneurship research has been since the publication of Venkataraman’s (1997) call to expand the domain, we reviewed all of the empirical articles published in the *Journal of Business Venturing (JBV)* from 1998 through the end of 2003. While a review of other journals publishing entrepreneurship research would have made this review more thorough we chose to review *JBV* articles because (1) it is one of the top entrepreneurship journals (Fried, 2003), (2) the editor of *JBV* is S. Venkataraman, the author of the provocative discourse upon which, in part, we based this research, and (3) given the overwhelming momentum the field has created to publish research based on economic outcomes, we judged that *JBV* would be the most likely outlet to find an editor willing to take a risk on research breaking with tradition.

Due to the limited nature of the review and the decision to focus on the theoretical framework (rather than any empirical analysis) we will just summarize the results of our review. During the period of our investigation, we found 120 articles that empirically examined an outcome of entrepreneurial activity. In all 183 outcomes were identified and were then coded by the three-author team until a unanimous coding enabled us to reflect each outcome variable in the Value Creation model (Figure 1). This occurred

over a few sessions and was iterative in that the coding assisted in redefining the components of the entrepreneurship value creation typology.

Most of the research (48% of the articles) examined focused on dependent variables concerned with economic performance. Another 44% focused on dependent variables concerned with socio-efficiency, and 8% focused on dependent variables concerned with promise. None of the articles examined focused on perpetuity, stewardship or sustainability dependent variables and only one examined a dependent variable concerned with eco-efficiency. While this analysis was limited to one journal, it demonstrates that entrepreneurship research continues to have a relatively narrow focus. It also suggests that an expansion of the focus of entrepreneurship research to investigate not-exclusively economic value creation outcomes may be fruitful for enriched understanding of the entrepreneurial phenomenon.

Discussion and Conclusion

Several entrepreneurial scholars have made the call for entrepreneurship research to explore dependent variables beyond measures of profit. In part these calls have resulted from research such as that performed by Amit *et al.* (2000), who have found that entrepreneurs themselves are commonly driven by more expansive goals than profit. Despite calls to the contrary from Amit *et al.* (2000), Venkataraman (1997) and others, our results and analysis suggest that to date entrepreneurship research has become very focused on economic and socio-economic performance. As we conceptualized and conducted this study we could not help but wonder at what point in time entrepreneurship research became simply, as Kuhn (1970, p. 24) put it, the 'mopping up operation . . . [of] normal science'. If ever there was a field that should be seeking and utilizing paradigm-breaking conceptualizations, we think entrepreneurship should be it. The study we have conducted has therefore been focused on both documenting and challenging dependent variable selections in entrepreneurship research to demonstrate a lack of adequate breadth, and to suggest that as a result the full range of potential variance in new venture value creation strategies has not been sufficiently explored.

We suggest, as does Kuhn (1970, p. 8), that 'competition between segments of the scientific community is the only historical process that ever actually results in the rejection of one previously accepted theory or in the adoption of another', and we involve concepts from environmental, sustainability and social responsibility literatures to support a more inclusive conceptualization of the field of entrepreneurship research. Moreover, since scholars in the field of entrepreneurship research are currently assessing the nature and scope of its distinctive domain (Venkataraman, 1997), we believe that there is no time like the present to raise questions about the adequacy of breadth in the *de facto* dependent variables utilized within our field. Our purpose in this study has therefore been to assemble and to integrate a broader-scope set of possible dependent variables so that outcome comparisons and analysis in entrepreneurship research can be much more comprehensive.

Seven years have passed since the publication of Venkataraman's (1997) important discourse on the domain of entrepreneurship research. Among several arguments, Venkataraman himself urges entrepreneurship scholars to look beyond traditionally used measures (dependent variables in our parlance) to distinguish, for example, entrepreneurship research from strategic management research; and also to enable a more accurate representation of the financial performance that is captured: in light of opportunity costs and premiums for risk and uncertainty. As we refine our understanding of the domain of entrepreneurship research we therefore suggest that entrepreneurship is about the pursuit of entrepreneurial rents that include economic, social and environmental value. Herein we have logically and systematically developed the concept of sustainable entrepreneurship, along with the related concepts, in a broad-spectrum typology of value creation/performance metrics.

This research has clear and important implications for entrepreneurship scholars and practitioners. For researchers, we hope to raise awareness of the ongoing need to go beyond traditional financial performance measures when studying the entrepreneurial phenomenon, and to introduce a viable multi-dimensional dependent variable for use by the field which is reflective of entrepreneurs' search for balancing or maximizing multiple value sets. The implications for practitioners may be just as great. We hope that, by engaging researchers in a discussion of the potential the triple-bottom-line-based value motivation has to move the field, we will have a significant impact on practitioners as well. Specifically, we hope to raise awareness among practitioners of the larger impact they can and do have on society, and to help them to create tangible measures for evaluating their own firm's performance against financial, social and environmental criteria.

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