COVER SHEET

An Operationalization of Stevenson's Conceptualization of Entrepreneurship as Opportunity-based Firm Behavior

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Abstract

Stevenson (1983) holds that entrepreneurial management, defined as a set of opportunity-based management practices, can help firms remain vital and contribute to firm and societal level value creation. While his conceptualization has received much attention, little progress has been made because of a lack of empirical tools to examine his propositions. This article seeks to resolve this by describing a new instrument that was developed specifically for operationalizing Stevenson's conceptualization. After two pre-tests, the instrument was tested full scale on a very large (1200+ cases) stratified random sample of firms with different size, governance structure, and industry affiliation. The results show that both in the full sample and in various sub-samples it was possible to identify six sub-dimensions with high discriminant validity and moderate to high reliability, which represent dimensions of Stevenson's theoretical reasoning. We label these *Strategic Orientation, Resource Orientation, Management Structure, Reward Philosophy, Growth Orientation* and *Entrepreneurial Culture*. We were further able to show that these dimensions only partly overlap with 'Entrepreneurial Orientation', the hitherto best established empirical instrument for assessing a firm's degree of entrepreneurship. Our instrument should open up opportunities for researchers to further evaluate entrepreneurship in existing firms.

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Introduction

Traditionally, entrepreneurship research has primarily been concerned with the start-up of new firms (Schendel, 1990; Sexton & Landström, 2000a). Recently, however, entrepreneurship has to an increased extent become accepted as a firm-level phenomenon deserving scholarly attention (e.g. Zahra, Karutko, & Jennings, 1999). This is based on the understanding that entrepreneurship is relevant to managers irrespectively of the size or age of their organization. As firm-level entrepreneurship research is still in its infancy it lacks solid, testable theory (Sexton & Landström, 2000b). In order to test theory, and thus develop the entrepreneurship field further, we must have access to valid measures of key constructs. Unfortunately, few validated measures of firm-level entrepreneurship exist today, which is a major impediment to such development.

Some useful work has been done in the area. Miller (1983) suggested that firms' degree of entrepreneurship could be seen as the extent to which they take risks, innovate and act proactively. He also developed a scale to empirically measure these dimensions. The measurement instrument has subsequently been further developed by Covin & Slevin (1986; 1988; 1989). Wiklund (1998) identified no less than twelve empirical studies based on their scales. The sheer number of studies applying this measure suggests that it is a useful instrument for measuring important aspects of entrepreneurship. Despite its popularity some weaknesses of the instrument should be noted. The instrument taps a mix of current attitudes and past behavior. Consequently, researchers find it hard to determine what type of construct the scale really measures and the proper label of the scale (Wiklund, 1999). In addition, careful assessment of item content and factor structure suggests that the proactiveness dimension is ambiguous (Lumpkin & Dess, 1996; 1997).

More importantly, while the instrument taps important aspects of firm-level entrepreneurship it may not be comprehensive enough (Zahra, 1993). In particular, while addressing partly overlapping aspects, the measure does not explicitly and directly address to what extent firms are involved in the recognition or exploitation of opportunity. Contemporary definitions of entrepreneurship tend to center around the pursuit of opportunity (e.g. Brazael, 1999; Churchill & Muzyka, 1994; Shane & Venkataraman, 2000; Venkataraman, 1997). In fact, Shane

& Venkataraman (2000) define the domain of entrepreneurship research in terms of opportunity recognition and exploitation. Unfortunately, to our knowledge, no measurement instrument that gauges firm-level opportunity-based behavior exists today. Thus, while acknowledging the value of the Miller/Covin & Slevin instrument, we hold that the development of such an instrument is essential.

The opportunity-based conceptualization of entrepreneurship developed by the Harvard professor Howard Stevenson and collaborators provides an important point of departure for the development of such an instrument. He has long argued that entrepreneurial value creating processes can take place in any type of organization (Stevenson, 1983; Stevenson & Gumpert, 1985; Stevenson & Jarillo, 1986; 1990). In established organizations entrepreneurship is largely a management question. As Stevenson notes: "Entrepreneurship is more than just starting new businesses … entrepreneurial management may be seen as a 'mode of management' different from traditional management" (Stevenson & Jarillo, 1990, p. 25)

Stevenson defines entrepreneurship as "The process by which individuals – either on their own or inside organizations – pursue opportunities without regard to the resources they currently control" (Stevenson & Jarillo, 1990, p. 23). This definition puts the focus on entrepreneurship as the pursuit of opportunity irrespectively of organizational context. This opportunity oriented conceptualization of entrepreneurship echoes classical definitions such as Kirzner's (1973) "alertness to opportunity". More recently, Stevenson's opportunity-based view of entrepreneurship has received widespread recognition and support in the literature (cf. references above). In summary, Stevenson has provided us with a conceptualization of entrepreneurship that places it within a broader management framework and is coherent with classical and well as contemporary definitions of entrepreneurship.

Despite its recognition and intuitive appeal, Stevenson's opportunity-based view of entrepreneurship has hitherto not been subject to systematic empirical testing. We find this to be a major impediment to the further development of entrepreneurship research given the importance of entrepreneurship to a gamut of organizations and the significance of opportunity-based definitions of entrepreneurship.

Consequently, the purpose of this article is to develop a measurement instrument to empirically gauge Stevenson's conceptualization of entrepreneurship as opportunity-based firm behavior and to test it on a large sample of firms. The next section outlines the eight dimensions of Stevenson's conceptualization. This provides the theoretical domain for the measurement instrument. Following this, we turn to a detailed description of how

the instrument was developed, revised and empirically validated. This includes an examination of convergent validity through comparisons with Covin & Slevin's (1989) widely used Entrepreneurial Orientation scale and an evaluation of our scale against established psychometric criteria. The following section discusses the usefulness and possible extension of the scale we have developed. We conclude with discussing the scholarly and managerial implications of the scale.

Stevenson's Opportunity-Based View of Entrepreneurship

Stevenson conceptualizes entrepreneurship as a management approach that has at its heart an all-consuming passion for the pursuit and exploitation of opportunity without regard to resources currently controlled (Stevenson, 1983). He contrasts entrepreneurial behavior with administrative behavior. Along the spectrum of behaviors between these extremes, promoter firms are placed at the entrepreneurial end and trustees at the administrative end. The promoter's sole intent is pursuing and exploiting opportunities regardless of resources controlled, while the trustee strives to make the most efficient use of its resources pool (as "required" by fiduciary responsibility). Certain business and environmental factors pull individuals and firms towards entrepreneurial behavior or towards administrative behavior.

In his early work, Stevenson categorized the management behavior of the promoter and trustee types along six dimensions: Strategic Orientation, Commitment to Opportunity, Commitment of Resources, Control of Resources, Management Structure and Reward Philosophy (Stevenson, 1983; Stevenson & Gumpert, 1985). He has developed his thoughts with slight variations in a series of subsequent papers where he more or less explicitly adds two more dimensions: Entrepreneurial Culture and Growth Orientation (Stevenson & Gumpert, 1985; Stevenson & Jarillo, 1986; 1990). Table 1 summarizes Stevenson's conceptualization and the key characteristics firms are likely to exhibit at the entrepreneurial and administrative ends of the spectrum. The dimensions are elaborated below.

Insert Table 1 about here

Strategic Orientation and Commitment to Opportunity

These first two dimensions are strategic in nature. *Strategic Orientation* describes what factors drive the creation of strategy. The promoter's strategy is driven by the opportunities that exist in the environment and not the resources that may be required to exploit them. As opportunities drive strategy, almost any opportunity is relevant to the firm. Once an opportunity is identified, resources to exploit it need, of course, to be marshaled. Conversely, the trustee's strategy is to utilize the resources of the firm efficiently. The resources are the starting point and only opportunities that relate to existing resources are relevant to the firm.

The *Commitment to Opportunity* is similarly related to strategic action. The promoter is action-oriented and able to commit and decommit to this action rapidly. Trustees tend to be analysis-oriented and as a result of multiple decision constituents, negotiated strategies, and an eye toward risk reduction, their behavior tends to be slow and inflexible. For a given opportunity, the promoter is much more likely than is the trustee to pursue it. If the trustee chooses to pursue the given opportunity, it would be with a much larger initial investment and the intention of remaining in that line of business for considerable time.

Commitment of Resources and Control of Resources

For Stevenson an opportunistic resource orientation consists firstly of a particular *Commitment of Resources.* An entrepreneurially managed firm attempts to maximize value creation by exploiting opportunities while minimizing the resources required, especially firm resources. In this effort the firm may "test the waters" by committing small amounts of resources in a multi-step manner with minimal (risk) exposure at each step. This allows the firm to stop and change direction at any step, if and when circumstances deem necessary. The accumulation of resources creates organizational pressures that make it difficult to maintain this type of commitment of resources. These pressures include the use of capital allocation systems, formal planning systems, certain incentive systems, attempts for managers to reduce their personal risk, and managerial turnover. The trustee's commitment of resources, therefore, is characterized by a thorough analysis in advance with large, but less reversible, investments.

The second component of Stevenson's opportunistic view of resources maintains that promoter firms further reduce the resources they own and use as much as possible. Promoters become skilled at the use of other people's resources including financial capital, intellectual capital, skills, competencies, etc. (Starr & MacMillan,

1990**)**. In this effort the firm is less concerned with owning resources than it is with its ability to use, exploit and/or extract value from them. Stevenson (1983) further explains that the process of determining which assets to own and which to rent, subcontract, outsource, etc. is "a time-phased sequenced of decisions" (p. 10) for the firm. Stevenson calls this dimension *Control of Resources*. The trustee, on the other hand, favors ownership control of resources, and the management of these resources tends to come into the focus of top management's attention.

Management Structure and Reward Philosophy

The *Management Structure* of the promoter organization is organic (Burns & Stalker, 1961). It is flat and made of multiple informal networks. Because some of the resources that the promoter uses may not be owned by the firm, and therefore fall outside of the formal organization, nontraditional means of organizing are often needed. The promoter's organization is designed to coordinate key non-controlled resources, to be flexible and to create an environment where employees are free to create and seek opportunity. The trustee's firm, on the other hand, is organized as a formalized hierarchy, characterized by clearly defined lines of authority, highly routinized work, systems designed to measure productivity, etc.

How a firm's *Reward Philosophy* is organized is important to firm behavior. The promoter is interested in creating and harvesting wealth (value). As a result, entrepreneurially managed firms tend to base compensation on how individuals contribute to value creation. The organization's structure is conducive to this evaluation because it is designed for independent action and accountability. Trustee firms, managed administratively, tend to relate their compensation to the amount of resources under the individual's control (i.e., assets and/or people) and with seniority. If the individual is successful, s/he is promoted to a position with even more resources under his/her management.

Growth Orientation and Entrepreneurial Culture

A closer reading of Stevenson's later work suggests that in addition to the six dimensions included in his charts, he also regards *Growth Orientation* and *Entrepreneurial Culture* (Stevenson & Jarillo, 1986, p. 11; Stevenson & Jarillo, 1990, p.25) as important dimensions of entrepreneurial management. As regards growth, it is assumed that promoters desire rapid growth and that entrepreneurial management will help create it. While the trustee may also desire growth, it must be slower, even, and at a steady pace, because anything faster is unset-

tling for the firm, i.e., it puts at risk the resources that have already been accumulated and the jobs of top management. Furthermore, trustees believe that administrative management will help create this type of growth.

The promoter firm encourages ideas, experimentation and creativity, thus developing an entrepreneurial culture in which new ideas are valued and sought out. As opportunity is the starting point, a broad range of ideas is worth seeking and considering. Conversely, if currently controlled resources were the starting point, then only ideas that relate to these resources would be relevant. With this narrow span the flow of ideas judged worthy of consideration would be much smaller even if ideas were actively sought for. Therefore, promoters create a work environment that is full of ideas, while trustees create a work environment with just enough ideas to match the resources of the firm, or even a lack of ideas.

In summary, Stevenson's view of entrepreneurial management puts opportunity-based behavior at the center. Because these behaviors may be "critical to the long term vitality of our economy" (Stevenson. 1983, p. 3), it is important to facilitate the empirical study of them. The remainder of this article describes the development, reliability testing and validation of a survey instrument intended to gauge Stevenson's view of entrepreneurial management.

Developing the Measurement Instrument

Writing the items

In the development of the scale to measure entrepreneurial management as conceptualized by Stevenson, we followed the recommendations for scale construction and evaluation made by Robinson, Shaver, & Wrightsman (1991). The first step in scale construction is writing the items to be included in the scale. This sometimes difficult and time-consuming task was facilitated by the fact that Stevenson's conceptualization is relatively detailed. His eight dimensions of entrepreneurial management provided guidelines for the relevant construct domain. In fact, he went so far as to include some specific questions that would be asked by the promoter firm and by the trustee firm (Stevenson, 1983; Stevenson & Gumpert, 1985). We took these as the starting point for a first version of the instrument. In addition to using those few questions more or less directly, they were used as prototypes for the other questions that we developed. This helped establish the instrument's face validity. The questions were initially developed in English and then translated into Swedish by a team of native English and native Swedish speaking researchers.

The items were of the forced choice type, with pairs of statements representing the opposite ends of the promoter/trustee continuum. A ten-point scale divided the two statements. The respondents were asked to mark the number which best represented the view of their firm. In order to avoid response set contamination, i.e., the tendency to respond to statements for reasons other than their content, the questions were arranged so that the promoter statements and the trustee statements appeared on both the right and left sides (Robinson et al., 1991).

The sample

In order to generalize the results it is essential to utilize a representative sample in scale development (Robinson et al., 1991). However, a simple random sample of firms would be totally dominated by micro enterprises with fewer than ten employees. Such firms represent neither a large share of economic activity nor what Stevenson had in mind when formulating his theory. Adhering to Stevenson' view of entrepreneurship as a management approach relevant to many different types of firms, it was vital to obtain a diverse sample with analyzable sub-groups. The primary sampling frame consisted of 24 cells of approximately 110 firms each. The sampling criteria were: (a) industrial sector divided into four groups (manufacturing, professional services, wholesale/retail, and other services); (b) employment size class divided into two groups (10-49, 50-249, which is the European Union's cutoff for small and medium sized enterprises, respectively); and (c) corporate governance divided into three groups (independent firms, members of company groups with fewer that 250 employees, and members of company groups with 250 employees or more). The total sampling frame consisted of 2455 firms. The sample was obtained from Statistics Sweden (the Bureau of Census). The target respondent was the CEO.

Data were collected in a two step manner. First, the firms were contacted and surveyed by telephone yielding 2034 responses (82.9%). Second, all firms interviewed were sent a mail survey. The questions of interest for this study were in the mail portion. We received mail responses from 1278 firms after two reminders. Given the formula provided by Dillman (1978), the response rate was 52.1%. This considerable response rate helped safeguard against non-response bias. Excluding cases with severe internal non-response, we have an effective sample of 1233 firms for the main analysis.

Testing and adjusting the scale

The scale was subjected to extensive pretesting to assure that the wording of individual items was understandable, and that the different items developed to measure the same dimension indeed did so. A total of 29

items were developed, two to six for each of Stevenson's dimensions of entrepreneurship. Twenty items are included in the final scales. The first version of the questionnaire was tested on a convenience sample of 186 small and medium-sized firms - both independent and those that were part of company groups. The responding CEOs were approached with a cover letter and a mail questionnaire. The mailings resulted in 121 completed questionnaires after one reminder (65% response rate). At this stage of the research we hoped to develop reliable indices of the eight dimensions of Stevenson's conceptualization, as well as combining them into an overall index of entrepreneurial management. As they are all assumed to be aspects of the same promoter/trustee distinction it was uncertain, however, whether one, eight, or some other number of dimensions would be extracted in an orthogonal factor analysis

The result from this pretest confirmed that the items were relevant, although alterations of individual items were needed. The second pretest had the form of a 'rolling' test. Mailings were halted when approximately 200 questionnaires had been sent out, and the target items were factor analyzed. As a result of this analysis a few more deletions and additions were made. The remainder of the full sample received a 22-item version of the questionnaire. When complete data had been collected it turned out that one resource item had a misloading on the Reward Philosophy factor and was dropped. Another resource item loaded on two different factors at levels barely above 0.40. As a result, this item was also dropped. A copy of the 20 questions that constitute our measurement instrument can be found in the Appendix (Table A1).

Factor analysis was run with the remaining 20 items using principal components extraction and varimax rotation. The results are displayed in Table 2. Each item has its highest loading on the factor it conceptually belongs to, and no item has a loading of 0.30 or more on any other factor. A vast majority of the loadings are in the high 0.60s and up. Our conclusion from this analysis is that we have successfully isolated six empirically distinct factors that represent important dimensions of Stevenson's conceptualization of entrepreneurship as opportunity-based business behavior. However, the number of factors is six rather than the eight that could have been anticipated on the basis of the theoretical dimensions. At the first pretest we were unable to extract a separate Opportunity Orientation factor. The items intended to tap that dimension dropped out of the analysis, and we found it hard to develop new ones without clear conceptual overlap with Strategic Orientation and/or Commitment of Resources. Further, the two resource dimensions Commitment of Resources and Control of Resources merged

into one factor, which we label Resource Orientation. Our interpretation of the analysis is that our six empirical dimensions represent Stevenson's eight conceptual dimensions. As noted above, there is little reason *a priori* to expect Stevenson's dimensions to be uncorrelated. Therefore, our extracting six orthogonal factors actually indicates a higher discriminant validity than expected.

Insert Table 2 about here

The fact that these dimensions could be extracted as orthogonal factors suggests that the dimensions are conceptually sound and that they need not co-vary empirically. If Stevenson is correct and entrepreneurial management is a "cohesive pattern of behaviors" (Stevenson, 1983, p. 16) we would expect the six dimensions to be positively correlated. When summed indices were created on the basis of the factor pattern, moderately positive correlations were generally found. Ten out of the fifteen correlations were positive and significant ($p < 0.001$). The only two significantly negative correlations occurred for the Growth Orientation index. This may be because the survey was undertaken immediately after a very severe recession, possibly demanding firms to find creative ways to shrink rather than to grow in order to survive.

To further assess the reliability of the indices, Cronbach's Alpha and item-total correlation coefficients were computed (see Table 3). The results revealed that while for Strategic Orientation (α=0.82), Management Structure (α=0.78), Growth Orientation (α=0.71), and Entrepreneurial Culture (α=0.68) the Cronbach's Alpha values were above or approaching Nunnally's (1967) recommended level, the Alphas for Resource Orientation (α=0.58) and Reward Philosophy (α=0.58) did not quite reach that level. Corrected item-total correlations ranged from 0.23 to 0.66, the majority being above 0.50. This indicated that all items share a high degree of variance with their respective constructs and that the addition of one or two items with similar measurement properties to the problematic indices should have increased their reliability coefficients considerably (Nunnally & Bernstein, 1994).

Insert Table 3 about here

Sub-sample validation

In a further attempt to examine the validity and reliability of these indices, sub-sample factor analysis was performed. As stated above, the sampling frame was stratified based on corporate governance (three groups), firm size (two groups), and industrial sector (four groups). Therefore, while the analysis was not done for each of the 24 cells (which would have meant too small sub-samples), it was done for the nine partly overlapping groups representing the selection criteria. There is no room here to give a full report on the results of these analyses. Table 4 summarizes the most important information.

Insert Table 4 about here

When the factor analysis was performed on the three sub-samples representing the governance criterion (i.e., independent firms, firms in small company groups, and firms in large company groups) the results closely mirrored the full sample results. There were six strong and clear factors with no incorrect highest loadings and very few side-loadings of substance. When the factor analysis was done on the two sub-samples based on size (i.e., 10-49 employees and 50-250 employees) the results again closely mirrored the results of the full sample.

Factor analysis of the four sub-samples representing the industrial sectors also yielded quite strong results. The manufacturing results closely mirrored the full sample. Knowledge-intensive services had a minor deviation in the form of a few 'side-loadings' above 0.30, while the wholesale/retail had the only occurrence of a highest loading on the wrong factor (i.e., one out of 180 [9 sub-groups times 20 items] loadings was wrong in this regard). However, the "other services" sub-sample produced our six factors plus an additional one (a split of the 'Resource Orientation' factor). When the analysis was rerun forcing it to six factors, the results were just one 'side-loading' short of perfect. The variance explained was close to 60% with very little variation across analyses. Over all, the results of the sub-sample validation were highly satisfactory. Taken together, the sub-sample analyses suggest that the measurement instrument gauges entrepreneurial management in different organizational contexts.

Examining convergent validity through comparisons with Entrepreneurial Orientation

The previous analyses established that the measurement properties of the scale are sound and that this applies to different sub-groups of firms. However, in order to establish the validity of the scale, i.e., if the scale really measures entrepreneurship, construct (convergent) validity must be ascertained (Robinson et al., 1991). To do so, we investigated to what extent the results obtained by our scale correspond to those obtained by the most well-established scale for measuring firm-level entrepreneurship (cf. the introduction), i.e., the Miller (1983) and Covin & Slevin (1986; 1988; 1989) entrepreneurial orientation (EO) scale

To measure EO we chose Covin & Slevin's (1989) version of the instrument. This scale was included in our survey instrument and was completed by the respondents. Although the scale was originally designed to tap three conceptually distinct dimensions (innovation, proactiveness and risk-taking) the EO scale is often used as one summed index. In order to compare our measure with EO, we summed the score for all 20 items representing the six dimensions derived from Stevenson. We labeled this latter index Entrepreneurial Management (EM).

The results reveal that the reliability of Entrepreneurial Orientation (EO; α=0.73 based on seven items, see below), and Entrepreneurial Management (EM; α=0.73) are above Nunnally's (1967) recommended level. The correlation between the two indices is 0.43, suggesting that the correlation between the two underlying theoretical constructs, corrected for measurement error, was 0.58 (Cohen & Cohen, 1983). This is important for two reasons. First, it demonstrates sufficiently high degree of correspondence between the two constructs to warrant that our scale for measuring entrepreneurial management as defined by Stevenson is indeed a valid measure of entrepreneurship. Secondly, it also demonstrates that while these two conceptualizations of entrepreneurship are positively related, they are only partly overlapping and gauge different and distinct aspects of entrepreneurship.

As a second way of examining how the two constructs are related we ran an exploratory factor analysis using items from both sets of measures. Previous research suggests that one of the EO items, dealing with "seeking or avoiding competitive clashes", taps competitive aggressiveness rather than proactiveness as intended (Lumpkin & Dess, 1996; 1997) and was therefore dropped. Exploratory factor analysis of the remaining eight items revealed that the innovation item concerning "emphasis on innovation versus marketing of tried and true products" formed a factor of its own. It was therefore removed as well.

We then ran a factor analysis with all 27 items (20 from the Entrepreneurial Management scale and seven from the revised EO scale) using principal components extraction and varimax rotation. We obtained an intriguing – and somewhat unexpected – result, which is displayed in Table 5. We knew at this stage that the EM and EO global indices had a substantial positive correlation. As we also already had six EM factors (Table 2), and because all the items are intended to capture some aspect of entrepreneurship we suspected that we would get mixed EM/EO factors in this analysis. In contrast, nine factors were extracted using the conventional Kaiser criterion (eigenvalue > 1). These nine factors cleanly represent the six sub-dimensions of the Entrepreneurial Management index and the three sub-factors in the EO measure. A vast majority of the loadings are in the high 0.60s and up with no 'side-loadings' above 0.30. This result for the full sample also holds up with high consistency in different sub-samples (similar to what was reported in Table 4). Due to space limitations, these results are not reported here.

Insert Table 5 about here

If all nine dimensions gauge some aspect of entrepreneurship, they would all be positively correlated. The fact that nine uncorrelated factors were extracted indicates that this might not be the case. Therefore, nine summed indices corresponding to the factors were constructed. For the most part we find positive correlations between the nine indices (Table 6). This holds for indices within the EM and EO groups as well as across them. However, none of the correlations are very high. Taken together, the above results suggest, in fact, that the 27 items represent nine dimensions of entrepreneurship that are relatively distinct conceptually and empirically. This suggests that the aspects of entrepreneurship discussed by Stevenson as well as Miller/Covin & Slevin are conceptually sound and empirically separable. Although positively correlated, the existence of nine identifiable dimensions extracted from a set of items which all are meant to capture some aspect of entrepreneurship indicates that entrepreneurship is a very broad and complex concept.

Insert Table 6 about here

Evaluation of the scale

In order to evaluate how well we have succeeded in developing a valid and reliable measure of Howard Stevenson's conceptualization of entrepreneurial management, we compared our results with the evaluation criteria of new scales suggested by Robinson et al. (1991). These authors list thirteen evaluation criteria as well as the requirements needed to meet different ratings on these criteria. These ratings range from exemplary (4), indicating that the measures taken to achieve validity/reliability are impeccable over extensive (3), moderate (2), and limited (1), to none (0), the latter indicating that the particular criterion has been inadequately considered in developing the scale.

The first criterion relates to theoretical development/structure, which is rated based on the extent to which prior research in the field is considered and face validity established. In order to achieve an exemplary rating all relevant literature should be taken into account. In the present case, exemplary rating was relatively easily achieved as only Stevenson's work needed to be considered, and as he provided examples of typical questions. The next criterion is pilot testing and item development. The use of a convenience sample in addition to a large random sample and the revision of some items give us a moderate rating. To achieve a higher rating, a larger item pool and more extensive deletion of items would have been necessary. In order to determine the distribution of responses and thus the ability for the scale to discriminate between different responses, Robinson et al. (1991) hold that normative information (e.g. means and standard deviations) should be calculated. Means and standard deviations are reported in Table 3. This gives us an exemplary rating regarding this criterion. An exemplary sample of respondents would be a national random sample with a response rate over 60%. For reasons explained above, we chose a stratified rather than a simple random sample. We do not quite meet the response rate criterion (52.1%). Therefore our rating is extensive rather than exemplary. Robinson et al. (1991) suggest that inter-item correlations provide important information regarding internal consistency. On average these correlations are well above 0.30, which corresponds to exemplary validity/reliability. The Cronbach's Alpha value is on average 0.69. This meets a moderate validity/reliability criterion (Robinson et al., 1991). Average Cronbach's Alpha values above 0.80 are needed in order to be exemplary. In factor analysis, all items pertaining to the same dimension loaded on the same factor. This gives an exemplary rating for this criterion. The test of the correlation with the entrepreneurial orientation construct suggests that the convergent validity criterion is met to a moderate

degree. In order to achieve an exemplary rating, a highly significant correlation with yet another related construct should also be established. The fact that clear factors were extracted in all factor analyses suggests discriminant validity (cf. Barringer & Bluedorn, 1999). To further establish discriminant validity, we correlated the global EM index with six other dimensions of strategy, which were included in the questionnaire. None of these correlations came close to the magnitude of the correlation between EM and EO. These analyses taken together warrant exemplary discriminant validity according to Robinson's et al. (1991) criteria. Due to the cross-sectional design, test-retest correlations could not be calculated and assessed. To assess freedom from response set, joint analysis of two or more studies would have been necessary. Our design also restricted us from investigating known group validity.

In order to make an overall evaluation of the scale, the average score across all criteria can be calculated. The ten criteria considered on average reach extensive validity/reliability. Three criteria were not considered; test-retest correlations, freedom from response set and joint analysis of two or more studies. If, instead of excluding these from the calculation, we instead conservatively assign to them the lowest possible value (i.e., zero), the average drops from extensive to moderate validity/reliability.

These extensive examinations of the scale's validity and reliability imply two things. First, there is nothing in the evaluation to suggest that the scale is invalid or unreliable. The scale received moderate to exemplary ratings for all the reliability and validity tests it was subjected to. Second, all tests of validity were not considered in the evaluation. Although this should not restrict the application of the scale to empirical research, further validation of the scale should be attempted.

Discussion

The purpose of this article was to develop a measurement instrument designed to tap Stevenson's conceptualization of entrepreneurial management. The result of this effort was a 20-item instrument from which a global index with satisfactory reliability could be computed. Alternatively, the measure can be broken down into six factors or sub-dimensions of entrepreneurial management which we label *Strategic Orientation, Resource Orientation, Management Structure, Reward Philosophy, Growth Orientation,* and *Entrepreneurial Culture.* These dimensions could be confirmed for nine partly overlapping sub-samples representing different categories of firms. While the measures are not yet perfected, we would hold that the elaborate process behind their devel-

opment and the clean results, in particular the remarkably clear and stable factor pattern, would suffice for claiming that we have developed a useful operationalization of Stevenson's conceptualization of entrepreneurial management. It is our hope that this tool will help move the study of entrepreneurship towards more rigorous research.

For adequate application and further development it is important that the nature of this measure be understood. Stevenson theorizes about entrepreneurial management, which is what our instrument is designed to tap. Hence, it is a firm-level measure. Further, it is not a direct measure of entrepreneurship if that is defined in terms of resource recombinations (Schumpeter, 1934; Moran & Ghoshal, 1999) or entry into new markets or market segments (Lumpkin & Dess, 1996). Stevenson's argument is that entrepreneurial management facilitates such processes by making it possible for organizational members to take entrepreneurial initiatives and by rewarding such efforts.

These properties of the concept have implications for the further validation of our measurement instrument. The fact that it is intended to be a firm-level measure makes our use of a single respondent a potential limitation. Validating the use of the CEOs' responses as representative for the firm involves two issues. First, the CEO's reported EM should have predictive validity with respect to the prevalence within the firm of efforts to recombine resources and entry into new markets or market segments. Second, EM as assessed by the CEO's responses should accord with EM based on other, informed respondents in the firm. If both relationships hold, the CEO-based measure would have both inter-respondent reliability and predictive validity. If inter-respondent reliability is high while predictive validity is low, either the theory or the measure is flawed. Alternatively, if inter-respondent reliability is low and predictive validity is high, EM would reflect an individual characteristic of the leader that affects business behavior through a different mechanism than the one originally assumed. Hence, both types of validity checks must turn out positive for CEO-based EM to be interpreted as a valid assessment of firm-level entrepreneurial management.

Assuming that Stevenson's theory holds, a test of predictive validity should show that firms with higher scores on the EM index or its sub-indices exhibit more entrepreneurial behavior in terms of resource recombinations and entry into new markets or market segments. A test of predictive validity could also measure business or societal level outcomes. A positive link between scores on our instrument(s) and value creation would strengthen

the validity of the measure in the tested context. However, entrepreneurial management may pay off in some contexts but not necessarily in others (Dess, Lumpkin, & Covin, 1997). It would then be advisable to select a testing ground where there is strong theoretical reason to believe that opportunity-driven (as opposed to resource-driven) strategies lead to superior performance. Failure to attain predictive validity in such contexts would invalidate the measure.

Further validation of the universality of the measure would also be valuable. First, we have shown that the measure holds across different types of firm. Replicating these results, extending the measure to other categories of firms (Hubbard, Vetter, & Little, 1998), would strengthen the validity of the measure and fine-tune its range of applicability. Second, we have developed and tested our instrument on a Swedish sample in the Swedish language. Establishing that the results hold for other (business) cultures and in other languages is an important validation task that would increase the usefulness of our operationalization.

Further improvements of the measures may be advisable. It is unlikely that the reliability of the global EM index would improve much by the addition or exchange of a few items (cf. Nunnally & Bernstein, 1994, p. 300). However, a twenty-item scale may be too long in some situations and it is conceivable that it can be shortened without much loss of information. If the intention is to carry out a more elaborate test of Stevenson's theory, or to further investigate some specific aspect of entrepreneurial management, further development of the sub-indices is advisable. This is particularly true for the Resource Orientation index. The Reward Philosophy index also had a less than satisfactory reliability. To a lesser extent this applies also to the Entrepreneurial Culture index. This could probably be solved by adding one or two more items as these latter sub-dimensions have not been problematic in other ways.

Scholarly and managerial implications

Given that our operationalization holds up well in further validation efforts, our results have several implications for future research. It appears that we now have a useful operationalization of the entrepreneurial management of firms. Importantly, the measurement instrument appears applicable across many different types of firms. This is advantageous because it is truly difficult to develop a unified direct measure of entrepreneurial behavior. The specific manifestations of opportunity seeking may vary for firms in industries of different maturity, technology and market structure. It is therefore difficult to compare relative levels of entrepreneurship across

contexts, or to study the causes and effects of entrepreneurship in mixed samples of firms. Assuming that it can be shown across contexts that entrepreneurial management is positively related to the relevant, context-specific opportunity seeking behaviors, researchers are now equipped with a tool that greatly facilitates their research. The antecedents and effects of entrepreneurship can be studied across contexts, using entrepreneurial management as a substitute for opportunity seeking behaviors. Further, researchers can examine the important question of whether entrepreneurial management is generally positively related to business outcomes, or if such effects are restricted to particular contexts or time frames.

Our results show that our operationalization of entrepreneurial management (EM and its sub-indices) only partly overlaps with the established alternative firm-level measure of entrepreneurship, Entrepreneurial Orientation (EO). This has important research implications. First, there are some problems with the EO measure. Its items gauge a mix of attitudes and self-report of past behaviors and some of them do not conceptually or empirically fall into their supposed dimensions. However, after dropping a couple of items, the three EO dimensions appeared in our analysis as distinct dimensions. In previous studies, EO has been shown to meaningfully relate to business contexts and outcomes. Our results suggest that EM cannot be used in its stead without the loss of information. Turning the argument around, the results imply that if our instrument represents a valid indicator of opportunity seeking behavior and/or value creation outcomes, then EO is also an incomplete assessment of firm-level entrepreneurship. The conclusion is that in order to get a complete assessment researchers should use both instruments. This breadth and multi-dimensionality could provide researchers with rich opportunities for conducting innovative research. On the other hand, including as many as 27 items in order to assess firm-level entrepreneurship is a problem from a practical point of view.

At present, entrepreneurship is encouraged throughout the economy (Dess et al., 1997) and many managers are looking for ways to make their organizations more entrepreneurial. Our findings thus far indicate that the entrepreneurial management of a firm involves many different aspects, ranging from overall strategic orientation to reward systems. While several firms may be entrepreneurial in one or a few respects, few are entrepreneurial throughout the spectrum. It is conceivable that in many situations a firm would have to excel along all or most of these dimensions in order to achieve the ability to create superior value. It is also conceivable, however, that it suffices to focus on a smaller set of management issues. The latter would indicate that there are many dif-

ferent routes to achieve high entrepreneurial performance. Further empirical research is needed in order to determine whether the outcome effects of different specific aspects of entrepreneurial management are linear and additive or if they also involve interactions and diminishing returns. Clarifying the nature of these relationships is an important task that should be carried out before drawing further normative conclusions.

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Appendix

Table A1 **Translated Items used for the Operationalization of Stevenson's Conceptualization of Entrepreneurship**

	Strategic Orientation	
1. As we define our strategies, our major concern is how to best utilize the resources we control.	1 2 3 4 5 6 7 8 9 10	As we define our strategies, we are driven by our perception of opportunity. We are not constrained by the resources at (or not at) hand.
2. We limit the opportunities we pursue on the basis of our current resources.	1 2 3 4 5 6 7 8 9 10	Our fundamental task is to pursue opportunities we perceive as valuable and then to acquire the resources to exploit them.
3. The resources we have significantly influence our business strategies.	1 2 3 4 5 6 7 8 9 10	Opportunities control our business strategies.
	Resource Orientation	
1. Since we do not need resources to commence the pursuit of an opportunity, our commitment of resources may be in stages.	1 2 3 4 5 6 7 8 9 10	Since our objective is to use our resources, we will usually invest heavily and rapidly. (R)
2. All we need from resources is the ability to use it.	1 2 3 4 5 6 7 8 9 10	We prefer to totally control and own the resources we use. (R)
5. We like to employ resources that we borrow or rent.	1 2 3 4 5 6 7 8 9 10	We prefer to only use our own resources in our ventures. (R)
6. In exploiting opportunities, having the idea is more important than just having the money.	1 2 3 4 5 6 7 8 9 10	In exploiting opportunities, access to money is more important than just having the idea. (R)
	Management Structure	
1. We prefer tight control of funds and operations by means of sophisticated control and information systems.	1 2 3 4 5 6 7 8 9 10	We prefer loose, informal control. There is a dependence on informal relations.
2. We strongly emphasize getting things done by following formal processes and procedures.	1 2 3 4 5 6 7 8 9 10	We strongly emphasize getting things done even if this means disregarding formal procedure.
3. We strongly emphasize holding to tried and true management principles and industry norms.	1 2 3 4 5 6 7 8 9 10	We strongly emphasize adapting freely to changing circumstances without much concern for past practices.
4. There is a strong insistence on a uniform management style throughout the firm.	1 2 3 4 5 6 7 8 9 10	Managers' operating styles are allowed to range freely from very formal to very informal.
5. There is a strong emphasis on getting line and staff personnel to adhere closely to their formal job descriptions.	1 2 3 4 5 6 7 8 9 10	There is strong tendency to let the requirements of the situation and the personality of the individual dictate proper job behavior.

Table A1 Cont.

	Reward Philosophy	
1. Our employees are evaluated and compensated based on their responsibilities.	1 2 3 4 5 6 7 8 9 10	Our employees are evaluated and compensated based on the value they add to the firm.
2. Our employees are usually rewarded by promotion and annual raises.	1 2 3 4 5 6 7 8 9 10	We try to compensate our employees by devising ways so they can benefit from the increased value of the firm.
3. An employee's standing is based on the amount of responsibility s/he has.	1 2 3 4 5 6 7 8 9 10	An employee's standing is based on the value s/he adds.
	Growth Orientation	
4. It is generally know throughout the firm that growth is our top objective.	1 2 3 4 5 6 7 8 9 10	Growth is not necessarily our top objective. Long term survival may be at least as important. (R)
5. It is generally known throughout the firm that our intention is to grow as big and as fast as possible.	1 2 3 4 5 6 7 8 9 10	It is generally known throughout the firm that steady and sure growth is the best way to expand. (R)
	Entrepreneurial Culture	
1. We have many more promising ideas than we have time and the resources to pursue.	1 2 3 4 5 6 7 8 9 10	We find it difficult to find a sufficient number of promising ideas to utilize all of our resources. (R)
2. Changes in the society-at-large often give us ideas for new products and services.	1 2 3 4 5 6 7 8 9 10	Changes in the society-at-large seldom lead to commercially promising ideas for our firm. (R)
3. We never experience a lack of ideas that we can convert into profitable products/services.	1 2 3 4 5 6 7 8 9 10	It is difficult for our firm to find ideas that can be converted into profitable products/services. (R)

Items that were dropped after pre-testing or as a result of initial factor analysis results are not listed above. Items marked (R) are reversed; i.e., a higher value suggests a lower level of entrepreneurship.

Table 1 **Stevenson's Conceptualization of Entrepreneurial Management**

Entrepreneurial focus (promoter)	*Conceptual dimension*	*Administrative focus (trustee)*
Driven by perception of opportunity	← Strategic orientation →	Driven by controlled resources
Revolutionary with short duration	← Commitment to opportunity →	Evolutionary with long duration
Many stages with minimal exposure at each stage	← Commitment of resources →	A single stage with complete commitment out of decision
Episodic use or rent of required resources	← Control of resources →	Ownership or employment of required resources
Flat, with multiple informal networks	← Management structure →	Hierarchy
Based on value creation	← Reward philosophy →	Based on responsibility and seniority
Rapid growth is top priority; risk accepted to achieve growth	← Growth orientation →	Safe, slow, steady
Promoting broad search for opportunities	← Entrepreneurial culture→	Opportunity search restricted by resources controlled; failure punished

Table 2 **Final Factor Analysis Results for Stevenson's Conceptualization of Entrepreneurial Management (n=1233)**

Factor (var. expl)	Factor 1 (11.2%)	Factor 2 (8.9%)	Factor 3 (13,7%)	Factor 4 (8.5%)	Factor 5 (8.1%)	Factor 6 (9.7%)
Variable						
StrategicOrientation1	.79					
StrategicOrientation2	.85					
StrategicOrientation3	.82					
ResourceOrientation1		.56				
ResourceOrientation2		.80				
ResourceOrientation5		.72				
ResourceOrientation6		.49				
MgmntStructure1			.75			
MgmntStructure2			.80			
MgmntStructure3			.68			
MgmntStructure4			.67			
MgmntStructure5			.65			
RewardPhilosophy1				.74		
RewardPhilosophy 2				.66		
RewardPhilosophy 3				.73		
GrowthOrientation1					.84	
GrowthOrientation2					.86	
EntreprenCulture1						.82
EntreprenCulture 2						.66
EntreprenCulture 3						.84

Note: Respondents who did not complete the mail part of the survey (n=751) were (of course) excluded from this analysis, as were respondents who skipped this entire section in the questionnaire. For other respondents with internal non-response mean substitution was employed. This concerns only a few cases except for the Resource items 5 and 6 (non-response approx. 150) which were introduced after the 'rolling' test run. 'Absolute values less than 0.30 were suppressed; i.e., no variables had substantial 'side loadings'. The displayed 'explained variance' is after varimax rotation. Cumulative variance explained is 60%. KMO = 0.774. Bartlett's test approx. $Chi^2 = 5214$; d.f. = 190; $p < 0.001$. The numbering of the factors has been changed for enhanced readability.

Table 3 **Descriptive Statistics and Measurement Reliability**

Index	Mean	S.D.	Alpha	Corrected item-total correlation
StrategicOrientation	**6.37**	**1.60**	**.82**	
Item 1	6.31	2.10		.64
Item 2	6.62	2.05		.72
Item 3	6.16	2.16		.65
ResourceOrientation	**5.72**	**1.47**	**.58**	
Item 1 (reversed)	5.84	1.87		.23
Item 2 (reversed)	5.14	2.32		.54
Item 3 (reversed)	5.42	2.48		.43
Item 4 (reversed)	6.62	1.94		.27
MgmntStructure	**6.71**	**1.60**	**.78**	
Item 1	6.00	2.40		.52
Item 2	6.94	2.01		.66
Item 3	7.11	1.86		.57
Item 4	6.79	2.15		.52
Item 5	6.91	2.05		.54
RewardPhilosophy	**6.35**	**1.45**	**.58**	
Item 1	6.94	1.80		.42
Item 2	5.25	2.23		.34
Item 3	6.86	1.80		.43
GrowthOrientation	**3.72**	**1.84**	**.71**	
Item 1 (reversed)	4.25	2.25		.56
Item 2 (reversed)	3.19	1.92		.56
EntreprenCulture	**6.53**	**1.67**	**.68**	
Item 1 (reversed)	7.12	1.88		.54
Item 2 (reversed)	6.08	2.44		.39
Item 3 (reversed)	6.40	2.07		.58

Table 4 **Stability of Factor Solutions across Sub-samples**

Sub-sample	**No. of cases**	**KMO**	***p* of Bartlett's test**	**No. of factors with Eigenval. >1**	**Cum. var. expl. by 6 factors**	**No. of incorrect loadings**	
						Type I[a]	**Type II**[b]
Governance:							
Independent	399	.77	0.000	6	61.1%	0	1
Part of 'small' group (<250 empl.)	446	.74	0.000	6	61.4%	0	2
Part of large group (250+ empl.)	433	.74	0.000	6	59.6%	0	1
Size:							
10-49 employees	655	.77	0.000	6	59.8%	0	1
50-249 employees	623	.76	0.000	6	61.2%	0	0
Industry sector:							
Manufacturing	372	.75	0.000	6	61.3%	0	1
Prof. services	366	.77	0.000	6	61.5%	0	3
Retail/Wholesale	226	.70	0.000	6	60.2%	1	4
Other services	314	.75	0.000	7[c]	60.2%	0	1

Note: a) No. of occurrences that the highest loading is on the 'wrong' factor. *b)* No. of 'side-loadings' > 0.30. *c)* The Resource Orientation dimension split into two factors.

Table 6 **Correlations for the Sub-indices of the Entrepreneurial Management and Entrepreneurial Orientation**

Index	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1 StrategicOrientation								
2 ResourceOrientation	.10**							
3 MgmntStructure	.33**	.04						
4 RewardPhilosophy	.33**	-.02	.36**					
5 GrowthOrientation	-.02	.09**	-.14**	-.11**				
6 EntreprenCulture	.14**	.15**	.10**	.10**	.15**			
7 EO_Innovation	.23**	.05	.15**	.17**	.11**	.34**		
8 EO_Proactiveness	.19**	-.05	.13**	.15**	.09**	.19**	.26**	
9 EO_Risktaking	.31**	.07*	.19**	.20**	.25**	.26**	.33**	.26**

Note: *p<.05 ** p<.001 n = 1211-1242

Table 5 **Final Factor Analysis for Stevenson's Entrepreneurial Management and Miller/Covin & Slevin's Entrepreneurial Orientation (n=1216)**

Factor (expl. var)	**Factor 3** (8.2%)	**Factor 5** (6.6%)	**Factor 1** (10.3%)	**Factor 2** (6.3%)	**Factor 4** (5.9%)	**Factor 6** (7.3%)	**Factor 7** (6.1%)	**Factor 8** (5.7%)	**Factor 9** (7.4%)
Variable									
StrategicOrientation1	0.78								
StrategicOrientation2	0.84								
StrategicOrientation3	0.81								
ResourceOrientation1		0.55							
ResourceOrientation2		0.80							
ResourceOrientation5		0.72							
ResourceOrientation6		0.50							
MgmntStructure1			0.74						
MgmntStructure 2			0.80						
MgmntStructure 3			0.68						
MgmntStructure 4			0.68						
MgmntStructure 5			0.65						
RewardPhilosophy1				0.73					
RewardPhilosophy 2				0.66					
RewardPhilosophy 3				0.72					
GrowthOrientation1					0.83				
GrowthOrientation2					0.85				
EntreprenCulture1						0.81			
EntreprenCulture 2						0.64			
EntreprenCulture 3						0.84			
EO_Innovation2							0.88		
EO_Innovation3							0.84		
EO_Proactiveness1								0.85	
EO_Proactiveness2								0.82	
EO_Risktaking1									0.68
EO_Risktaking2									0.75
EO_Risktaking3									0.77

Note: Respondents who did not complete the mail part of the survey (n=751) were (of course) excluded from this analysis, as were respondents who skipped either of these entire sections in the questionnaire. For respondents with internal non-response mean substitution was employed (cf. Table 1). Absolute values less than 0.30 were suppressed; i.e., no variables had substantial 'side loadings'. The displayed 'explained variance' is after varimax rotation. Cumulative variance explained is 63.6%. KMO = 0.79. Bartlett's test approx. $Chi^2 = 7455$; d.f. = 351; $p < 0.001$. The numbering of the factors has been changed for enhanced readability.