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ENTREPRENEURIAL ORIENTATION AND FIRM PERFORMANCE: A DYNAMIC PERSPECTIVE

Tommy Høyvarde Clausen, Nordland Research Institute, Norway
Einar Lier Madsen, Nordland Research Institute, Norway

ABSTRACT
In this paper we help fill a gap in the literature on the relationship between entrepreneurial orientation (EO) and firm performance. Compared to prior studies our paper examines whether and to what extent the change in EO over time influence firm performance. In order to address this issue we draw on survey data where firms have been administered a questionnaire at two points in time matched with official firm register data about survival and exit in Norway. Regression analysis with control for selection bias is used to examine the relationship between EO and firm performance. Our results show that the firms initial EO at Time period 1, as well the change in EO over time, influence firm performance in Time period 2. Overall, this paper contributes to the literature by incorporating a dynamic perspective on the relationship between EO and firm performance.

INTRODUCTION
Firms need to be entrepreneurial in order to survive and successfully compete, especially within fast-changing industries (Teece, 2007). As future profit streams from existing operations are uncertain, firms may benefit from adapting a strategic orientation towards entrepreneurship (EO) (Wiklund & Shepherd, 2005). This includes a willingness to innovate, to take risks, and to be more proactive in the marketplace compared to competitors. Given the alleged importance of acting entrepreneurially for firms, many studies have examined the relationship between EO and firm performance and discovered a positive relationship between them (see Rauch, Wiklund, Lumpkin, & Frese, 2009 for a review).

A recent review has argued that EO has “received substantial conceptual and empirical attention, representing one of the few areas in entrepreneurship research where a cumulative body of knowledge is developing” (Rauch et al, 2009, p.761). Although scholarly work on the EO-firm performance relationship has grown substantially over the years, there are still areas and topics that require further research. One generic shortcoming is that the relationship between EO and firm performance has been examined in a static way. This represents a major deficiency. As argued by a recent review: “the causal direction between EO and performance has not been addressed. Most of the studies could not test the effect of EO on performance in a strict sense because they used either cross-sectional data or else measured EO at one point in time and performance some years later” (Rauch et al, 2009,p. 781). Although interesting to examine, testing the EO-firm performance in a static setting holds less promise for future research. Therefore, the aim with this paper is to analyze the relationship between EO and firm performance in a more dynamic way examining whether and to what extent the change in EO over time influence firm performance. A more dynamic setting where EO and firm performance is measured at least two points in time opens up for some interesting issues that prior research has not examined before.
To study this is also in line with the view on entrepreneurial decision-making as a dynamic process within firms (Miller, 1983; Lumpkin & Dess, 1996), but where little is known about whether and to what extent the increase or decrease in firms EO influence firm performance. Moreover, according to Rauch et al. (2009) “studies that repeatedly measure both EO and performance would be valuable because they could help to tease apart the causal relationship between EO and performance” (p. 781). In this paper we add to the literature by posing the following research question: **Whether and to what extent does the change in EO over time influence firm performance?**

Incorporating change and time when examining the relationship between EO and firm performance meet the need to incorporate the time dimension in studies of changes of the firm in general (Pettigrew, Woodman, & Cameron, 2001). This is a part of a broader trend within organizational research where it is recognized that “the theories in the organizational sciences are either explicitly or implicitly longitudinal in nature. Yet in reality, the vast majority of theory testing in the organizational and applied social sciences still uses cross-sectional designs whereby inferences are made from associations between two or more static variables” (Ployhart & Vandenberg, 2010, p. 95). Also EO is a theory that has important longitudinal and dynamic aspects.

The EO-performance issue is analyzed within the context of an econometric model that deals with sample selection / attrition / exit of firms over time and which incorporate a dynamic relationship between EO and firm performance. The rest of this paper is organized as follows. In the next section we discuss theory and prior studies on the EO – firm performance relationship, including formation of the hypothesis to be tested. This is followed by the methodology section. Thereafter, we test the hypotheses empirically and discuss the results. Concluding remarks are given in the final section.

**LITERATURE REVIEW AND HYPOTHESES**

**Entrepreneurial orientation and firm performance**

EO refers to a firm’s strategic orientation, capturing specific entrepreneurial aspects of decision-making styles, methods and practices ( Wiklund & Shepherd, 2005). The EO concept highlights the dynamic nature of entrepreneurial decision-making within firms. With its origins in the strategy-making literature the EO concept focuses on the processes in which firms and their managers act innovatively, proactively and take risks. In the words of Miller (1983) an entrepreneurial firm is “one that engages in product-market innovation, undertakes somewhat risky ventures, and it first to come up with “proactive” innovations, beating competitors to the punch” (p.771). Several researchers have subsequently argued that EO is a combination of three dimensions: innovativeness, proactiveness, and risk taking (Rauch et al, 2009). In their seminal article, Lumpkin & Dess (1996) made the key distinction between entrepreneurship and entrepreneurial orientation. The essential act of entrepreneurship, they argued, is new entry where a new firm or an existing firm enters a new or established market with new or existing goods or services. EO refers, in comparison, to the processes, practices and decision-making activities that lead to new entry.

With its origin in the strategy-making literature, the relationship between EO and performance is central to EO theory (Lumpkin & Dess, 1996). The overall argument is that managerial decision-making within firms that enable a firm to allocate resources to and invest in their EO also have higher performance. The general reasoning behind this is that companies that put innovation in the forefront of their strategy create novel and breakthrough new products and processes and thereby put themselves in a position where they may generate extraordinary economic perfor-
mance (Schumpeter, 1934/1983). Proactive companies are characterized by being first-to-market reaping first-mover advantages where they may charge high prices within premium market segments and “skim” the market ahead of competitors (Zahra & Covin, 1995). Further, prior research has suggested that riskier strategies may prove superior in the long term compared to less risky ones (March, 1991; Wiklund & Shepherd, 2005).

Many studies have suggested, and subsequently tested, that companies with a higher EO also have a higher performance level (for a review see Rauch et al, 2009). With time, the EO-firm performance relationship has been elaborated to include the role of mediator and moderator variables such as network capabilities (Walter et al, 2006), information acquisition and information utilization (Keh et al, 2007), strategy (Moreno & Casillas, 2008) and social capital (Stam & Elfrin, 2008). According to a recent meta-review of the EO-firm performance relationship (Rauch et al, 2009), EO has a moderately large relationship with firm performance, a correlation of $r=0.24$. The same review demonstrates that this positive relationship holds also for performance measures that are non-financial and financial, and also for financial performance measures that are self-reported and based upon archival data (e.g. annual accounts etc.). Hence, a large number of studies have documented that EO has a positive and significant influence on firm performance.

Changes in EO over time and firm performance

The EO concept highlights the dynamic nature of entrepreneurial decision-making within firms. With its origins in the strategy-making literature the EO concept focuses on the processes in which firms and their managers act innovatively, proactively and take risks. In the words of Miller (1983) entrepreneurship is: “the process by which organizations renew themselves and their market by pioneering innovation and risk taking” (p.770). EO theory has not really been tested in a more dynamic setting, in line with many other theories in the organizational sciences. This has led a recent review to argue that “We wonder, therefore, whether most of the theories underlying the disciplines within the organizational sciences have ever been truly tested, given that to do so would mean examining actual change in the focal variables” (Ployhart & Vandenberg, 2010, p.97).

In their seminal article, Lumpkin and Dess (1996) argued that the “entrepreneurial orientation construct, we believe, represents the process aspect of entrepreneurship” (p. 162). A process perspective on entrepreneurship calls in general for the inclusion of time in the analysis. Within the context of EO research, we argue that a process perspective on entrepreneurship calls for the influence of changes in EO over time on firm performance. Although Lumpkin and Dess (1996) argued that firms can sustain their level of EO over time, they also opened up for the idea that “when members of a firm become overly passive or decline to take risks or exercise creativity in order to capitalize on a market opportunity, they run the risk of losing the entrepreneurial edge” (p. 163).

Incorporating the role of changes in EO over time on firm performance is important because a basic premise underlying the strategy-making literature is that the processes and strategies that managers initiate matter (Lumpkin & Dess, 1996). Within the EO context, firms and their managers can over time choose to allocate resources to – or away from – innovative, risky and proactive endeavors within the firm (Lumpkin & Dess, 1996). Little is known about whether and to what extent the change in EO over time influence firm performance. One exception is Madsen (2007) who developed his own operationalization of the EO construct and found that firms with the same or higher EO between two points in time enjoyed significantly better performance. Although interesting, Madsen (2007) did not use the established EO scale (based on Covin & Slevin, 1989) in the research nor controlled for attrition / exit between the two points in time. With these shortcomings in mind, the current paper adds to the
EO-firm performance literature by testing the following two hypotheses, using the established EO scale and a regression analysis which controls for exit/attrition over time:

- **H1:** Firms initial EO at time period 1 (T1) is positively related to firm performance in time period 2 (T2).
- **H2:** The change in firms EO between time period 1 (T1) and time period 2 (T2) is positively related to firm performance in time period 2 (T2).

**Method**

**Research design and sample**

In order to examine the relationship between EO and firm performance we have collected survey data from R&D active firms in Norway at two points in time. The population was all businesses registered to a scheme for tax deduction of R&D costs (called SkatteFUNN). As all enterprises which are eligible for taxation could register their R&D activities to receive a tax refund, the registered enterprises include close to all enterprises which are involved in such activities at the time of our study. The objective of this program was to contribute towards enhancing and strengthen the R&D capabilities of Norwegian firms. We focused on R&D active firms because one may expect such firms to be more innovative and change-oriented, and therefore suitable for studying whether and to what EO, and the change in EO over time, influences firm performance. This is in line with the argument that an entrepreneurial orientation may be especially important for firms in fast-changing high-tech environments and industries (Eisenhardt & Martin, 2000; Teece, 2007).

Using a selection of R&D active firms has some additional advantages compared to a more random sample of firms. Such a sample can be presumed to be more homogenous than a random sample would be, which make it easier to control for interference. In this connection it contributes to the quality of the sample in relation to what is to be studied. This gives the sample a theoretical basis. Moreover, it can be argued that such a sample leads to improved empirical relations where more artificial and spurious results can be avoided. This strengthens the internal validity of the sample, and increases the probability to discover and explain phenomena of interest in this paper.

All enterprises which registered R&D activities during May to December 2005 were approached, in all 1721 enterprises. A web-based questionnaire was developed containing the measures of EO as well as measures of resources, innovation activities, R&D activities and performance of the firm. A link to the questionnaire was e-mailed to the enterprises within a month after they registered R&D activities. The initial mailing was followed by two e-mail reminders. Of the enterprises approached, 1199 (70%) returned filled-in questionnaires. The 1199 companies that filled out the questionnaire were contacted again 1.5 - 2 years later. The majority of enterprises were contacted in spring/summer 2007. All received a web-based questionnaire containing the measures of EO, performance, and resources. 754 of the enterprises returned filled-in questionnaire.

We have merged our survey data with the Norwegian firm registry. This was done in order to examine whether and to what extent firms that did not reply to our follow-up questionnaire did not do so either because of (1) bankruptcy, merger, other exit, or (2) because they did not answer the survey (even though the firms were alive). This showed that only 4 firms had gone bankrupt and that the rest of the firms that we do not observe an answer from at T2 did not reply even though they were alive.
The main source of selection bias that we need to handle is thus the non-response from “alive” companies. We will control for such non-response bias by using Heckman regression in the analysis. Applied to the context of this paper, Heckman regression is a method that in the first step analyses the probability that a firm at t1 will answer the survey at T2 depending on observables at T1. This is modelled as a probit regression. Based on the probit regression in T1, the inverse mills ration (sometimes called lambda) is added to the analysis in the second step where the goal is to analyse the relationship between EO and firm performance (using OLS regression). The inverse Mills ratio is a control factor which controls for unobserved heterogeneity. More concretely, the inverse Mills ratio will control for unobserved factors that are related to both firms’ probability of answering the survey at t2 and firm performance. In order for this method to work properly one variable needs to be significant correlated with firms’ probability of answering the survey and assumed to be uncorrelated to firm performance.

Self-reported data and (common method) bias

In this paper we use self-reported data. Within the context of organizational research and studies of entrepreneurial decision-making this may be one of the best ways of conducting research. In the words of March and Simon (1993) “For many purposes, the simplest and most accurate way to discover what a person does is to ask him”(p. 163). One important advantage of using perceptual approaches is that the research may have a relatively high level of validity because one can pose questions that directly address the underlying nature of the construct to be measured. Further, self-reported data is also useful for capturing situations and conditions within firms with a high degree of detail and specificity. In addition, measuring constructs by multi-items scales survey will further increase construct validity (Lyon, Lumpkin & Dess, 2000).

Our self-reported data is further supplied by a single informant. There are advantages to using only a single informant. First of all, there is a high likelihood that the most knowledgeable person in the organization provides the information. This is particular in the case of small firms where “the respondent may, in fact, reflect those of the firm” (Lyon, Lumpkin & Dess, 2000, p.1058). An additional advantage is that it may increase the probability that firms will participate in the study as only one individual in the organization is impacted (Lyon, Lumpkin & Dess, 2000).

Self-reported data from single respondent is not without problems however, and may introduce the common method bias problem. At least three problems arise when using such data in longitudinal analysis of firms. The use of self-reported data from single informants may lead to functional bias. Different (top) management team members may perceive things differently, such as how their firms should score on the dimensions of EO (Lyon, Lumpkin & Dess, 2000) as well as on other perceived items measuring firm resources and performance. In this paper we have attempted to correct for functional bias by asking our respondents about their role and function in the firm on a pre-selected list and inserted this information as control variables in our econometric analysis. We distinguished between the following roles and functions: CEO, project leader for the SkatteFUNN project, CFO, R&D manager, accountant or other. Respondents were allowed to tick one or potentially all of these roles as respondents in especially small firms can fulfill many roles and functions at the same time. This information is subsequently included as binary control variables in our analysis.

A second problem is “mortality” (Campbell & Stanly, 1963; Lyon, Lumpkin & Dess, 2000). Mortality describes attrition of respondents due to departure from the firm, job changes, loss of interest etc., and applies to studies that follow firms over time. In this paper we will use the
Heckman regression model to correct for potential bias that may arise from attrition of firms between the two survey waves.

A third problem related to mortality is that a firm’s EO may, in part, be an artifact of the individual completing the survey. The potential problem is that: “when data are collected over a period of time, the original respondent may have been replaced. In that case, the researcher must be concerned with the degree to which an observed change in EO may be an artifact of the change in respondent or may reflect an actual change in the firm’s EO” (Lyon, Lumpkin & Dess, 2000, p.1059). This is not a large problem within the context of our study because surveys at T1 and T2 is administered to the project leader of the SkatteFUNN project and the project leader has to disclose his professional/personal job e-mail address (and not a general e-mail address to his company) when applying for public R&D tax-credits. Attrition of firms between T1 and T2 is a potentially larger problem but a potential problem we handle by using the Heckman regression method which corrects for sample selection bias.

Prior research has however suggested that self-reported single-informant data have high reliability and validity. In a well-known study, Chandler and Hanks (1993) found a high correlation between managers’ assessment of business volumes (earning and sales) and archival sales figures and they also found that strong evidence of convergent and discriminant validity between self-reported business volumes and sales growth through factor and alpha analysis. Although prior research has suggested that subjective performance measures, like the ones used in this study, should not suffer much from common method bias and other measurement problems, we will add firms’ self-reported performance at T1 as a predictor of self-reported performance at T2 in order to strengthen the validity of our econometric results. Adding performance at T1 could be important. The inclusion of such a variable is a simple way to account for historical and stable factors that cause current differences in the dependent variable (Wooldridge, 2006). This is especially the case when one or more independent variable in the regression could be correlated to one or more omitted variables and the omitted variable has an influence on current performance. Inclusion of a lagged dependent variable in the analysis is thus a “way to use two years of data for estimating a causal effect” (Wooldridge, 2006, p. 461).

Variables and measures

**Dependent variable- Business performance.**

It may sometimes be difficult to get access to “objective” data on small firm performance. This is especially the case for small firms that are not obliged to file their annual accounts information. Some of the firms in our sample are in this situation were no annual accounts data exist. Performance may also be difficult to measure with single items, as performance may be multidimensional in nature (Wiklund & Shepherd, 2005). Following prior studies on the EO-performance relationship we adopt different dimensions of performance in our empirical analysis (e.g. Wiklund & Shepherd, 2005; Madsen, 2007). Based on Wiklund & Shepherd (2005) we measured performance with 4 items where respondents were asked to assess their firms’ performance relative to competitors. Respondents were asked to assess their sales growth, employee growth, profitability and market share on a 7 point scale ranging from 1 (much worse) to 7 (much better). Exploratory factor analyses at T1 and T2 further revealed that the 4 items loaded high on the same factor. The 4 items were subsequently aggregated into an index at T1 and T2 (Cronbach’s alphas are 0.77 and 0.86 respectively).
Key explanatory variables - Entrepreneurial orientation. In order to measure EO (the dimensions innovativeness, proactiveness and risk taking) we use items from Covin and Slevin’s (1989) strategic posture scale. We use the one-sided version of the scale where respondents are asked to indicate their agreement with 9 statements on a 7 point scale (1 = completely disagree, 7 = completely agree). Innovativeness was measured using the following three statements: “Top-managers emphasize R&D, technological development and innovation,” “The firm has launched many new products and services during the last 5 years” and “New products/services have been very different from existing products/services on the market.”

The following three items capture proactiveness: “Relative to the competitors my firm initiates actions to which competitors then respond to,” “Relative to the competitors my firm will be the first to introduce new products/services/technologies” and “Relative to other firms my firm typically adopts a very competitive “undo-the competitors” posture”.

Risk taking was assessed by the following three items: “Top-managers has a strong proclivity for high risk projects with chances of high returns,” “Top-managers thinks it is necessary with bold and wide ranging acts are necessary to achieve the firms objectives” and “Our firm adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.”

We will use EO as a summated scale at T1. We will also add the change in EO between T1 and T2 to our regression analysis. This variable is called Delta EO (defined as EO at T2 – EO at T1).

Independent variables - resources

In line with Wiklund and Shepard (2003) we control for difference among firms in their resources when examining the relationship between EO, as well as the change in EO, over time. Three types of resources are identified; market, technological and financial resources.

Market resources include two items and describe the firm’s market/marketing resources. Items are: “Compared to our competitors the firm has a better expertise in marketing, and “Compared to our competitors the firm has a better special expertise regarding customer service”. Items are adopted from Wiklund and Shepherd (2003).

Technological resources include three items and describe the firm’s technical resources. Items are: “Our firm has a competence which is difficult to copy”, “Compared to our competitors the firm has a better technical expertise, and “Compared to our competitors the firm has a better expertise regarding development of products or services”. Items are adopted from Wiklund and Shepherd (2003) and Madsen, Alsos, Borch, Ljunggren, and Brastad (2007).

Financial resources include three items and describe the firm’s access to financial capital. Items are: “Compared to competitors our firm has a strong financial position”, “banks and other financial institutions are very interested in financing our projects” and “compared to competitors, our firm has better access to financial capital”. Items are generated from the interviews with the firms and based upon the literature on financial market failures where it is argued that lack of financial resources will inhibit innovation and R&D within firms, SMEs and start-up firms in particular (see Hall 2002ab). (Hall, 2002)
Independent variables - environmental dynamism

Firms are shaped by their external environment (Nelson & Winter, 1982; Aldrich, 1999). In order to account for this we adopt a scale from Khandwalla (1977) that measures the extent to which the firms external environment are predictable or almost unpredictable, eg, the degree of dynamism of the firms external environment. 4 items measuring environmental dynamism were adopted in the survey based upon Khandwalla (1977). Items are: “Our firm must change its marketing practices extremely frequently in order to keep up with the market and competitors”, “the rate at which products/services are becoming obsolete in the industry is very high”, “actions of competitors are almost unpredictable” and “demand and consumer tastes are almost unpredictable”. Cronbach’s alpha is 0.66.

Independent variables – firm size and age

Empirical studies have found that smaller and younger firms have a higher growth rate when compared to larger and older firms. Hence, we control for difference among firms in their size and age at T1.

Excluded variable

In the Heckman regression we need to include 1 variable when predicting firms’ probability of answering our survey at T2 and at the same to exclude this variable from the OLS regression when we analyze the relationship between EO and firm performance. To this end we will use a question in our survey at T1 about whether and to what extent public funding from the SkatteFUNN program was important for the firm (variable called policy funding). The reasoning is that firms that perceive the public funding from the program to be important will also answer to e-mail surveys about the program (e.g. our survey at T2).

Analysis

First stage in the Heckman regression

The first stage results from the Heckman regression is reported in the table 1 below. Results show that firms that perceive funding from the SkatteFUNN program to be important for their R&D activity at T1 are significantly more inclined to answer our survey at T2. Also firms with higher technological resources at T1 are significantly more inclined to answer our follow-up at T2, and older firms are significantly more likely to participate in the follow-up survey. Companies in more dynamic and changing environments at T1 are significantly less likely to answer the survey at T2.

Second stage in the Heckman regression

The second stage in the Heckman regression shows the results where the relationship between EO and firm performance has been addressed in a dynamic way. Results are reported in table 2 below. These results show that EO at T1 is a positive and significant predictor of firm performance in T2. In addition, the change in EO from T1 to T2 is a positive and significant predictor of firm performance in T2. These results hold when we control for non-response bias, firms’ past performance in T1, their resource base (technology, market and finance) in T1, and characteristics of the environment in which the firms operate in (environmental dynamism in T1). These results offer empirical support to hypothesis 1 and hypothesis 2.
Discussion of the results

In this paper we have tested two hypotheses. Hypothesis 1 followed to a large extent the prior empirical literature on EO-firm performance with the exception that EO and firm performance was measured at two different time periods in two different surveys. This hypothesis stated that: “Firms initial EO at time period 1 is positively related to firm performance in time period 2”. This hypothesis was supported by the collected data and empirical analysis. Our second hypothesis was more novel and differed from what has been tested in the EO-firm performance literature. This hypothesis stated that “The change in firms EO between time period 1 and time period 2 is positively related to firm performance in time period 2”. Also this hypothesis was supported by the collected data and the empirical analysis. We believe that testing and confirming these two hypotheses has added to our understanding of how EO influences firm performance in a more dynamic fashion. While prior studies have confirmed that EO is a significant and positive predictor of firm performance in a static fashion, this paper has contributed to EO theory by showing that EO also influence firm performance in a more dynamic way where the changes in the firms EO over time is positively related to firm performance.

Conclusion

This paper has focused on a gap in the EO literature concerning the EO-firm performance relationship and its possible dynamic nature. Prior studies have examined the EO – performance relationship in a mainly static way where EO and firm performance in many cases have been measured in the same survey at the same time. Entrepreneurial decision-making within firms is on the contrary a dynamic process where firms and their (top) managers may decide to allocate more or less resources to proactive, risky and innovative activities within their firm (Lumpkin & Dess, 1996). Much less is known about whether and to what extent the change in firms EO over time influence firm performance. Based on this gap in the EO literature this paper asked the following research question: Whether and to what extent does the change in EO over time influence firm performance?

Our results show that firms initial EO at time period 1, as well the change in EO from time period 1 to time period 2, have a positive and significant influence on firm performance in time period 2. These results hold even when controlling for non-response bias, past performance, firms technological, financial and market resources, and characteristics of their environment (environmental dynamism). In sum, we believe that this paper has helped to extend the EO literature where the importance of time and changes over time in firms EO are important and have performance implications. Nevertheless, the paper is only a first small step in the direction where EO and firm performance is analyzed in a more dynamic way. However, little is known about the development and evolution of EO over time and how this may influence firm performance. Madsen (2007) argues that further research should look into if there is a possibility of excessive entrepreneurship (i.e. too much risk-taking propensity, too much innovation, and too much pro-activity). The EO literature gives little guidance on such issues. One could even ask if there is a need for a theory on how EO should change over time (e.g. Does EO grow linearly? Does it plateau? Is it non-linear?). Therefore, there is a need for more studies and theory development within this field on the evolution of EO over time and its performance implications.

As all studies also this has also its limitations. One limitation is that we only have data on EO and firm performance at two points in time. In order to put the relationship between EO and firm performance to a tougher test, data at more than two points in time need to be collected. Another
limitation is that we have focused on R&D active firms in this paper. Whether and to what extent the changes in EO over time influence firm performance in a positive way for non-R&D active firms is not currently known. A third limitation is that it would be interesting to test the relationship between EO and firm performance in a dynamic fashion using objective performance data. A final limitation is that the study is conducted in a one country setting.

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REFERENCES


APPENDIX Principal components factor analysis – items measuring performance

| Profitability | .770 |  .836 |
| Sales growth  | .868 | .876  |
| Employee growth| .798 | .828  |
| Higher market share | .718 | .762  |
| N             | 818  | 539   |
| Explained variance | 62 % | 68 %  |

Table 1 Predicting firms probability of answering the follow-up survey at T2

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient (probit)</th>
<th>Coefficient (probit)</th>
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</thead>
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<td>Policy funding</td>
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<td>.04**</td>
</tr>
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<td>Environmental dynamism_T1</td>
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<td>-.11**</td>
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<td>Entrepreneurial orientation_T1</td>
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<td>.04</td>
</tr>
<tr>
<td>Technological resources</td>
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<td>.09**</td>
</tr>
<tr>
<td>Financial resources</td>
<td>.03</td>
<td>.01</td>
</tr>
<tr>
<td>Market resources</td>
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<td>.004</td>
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<td>.0003</td>
</tr>
<tr>
<td>Firm age</td>
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<td>.01***</td>
</tr>
<tr>
<td>Firm performance_T1 (not estimated)</td>
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<td></td>
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<tr>
<td>Constant</td>
<td>-.35</td>
<td>-.31</td>
</tr>
</tbody>
</table>

N 943 859

Table 2
Analyzing the relationship between EO and firm performance in the second stage Heckman

<table>
<thead>
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<th>Variables</th>
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<th>Coefficient (OLS)</th>
</tr>
</thead>
<tbody>
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<td>Environmental dynamism_T1</td>
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<td>.06</td>
</tr>
<tr>
<td>Entrepreneurial orientation_T1</td>
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<td>.17**</td>
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<td>Delta_EO</td>
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<tr>
<td>Market resources</td>
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</tr>
<tr>
<td>Firm age</td>
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<td>-.008</td>
</tr>
<tr>
<td>Firm performance_T1 (Not estimated)</td>
<td></td>
<td>.65***</td>
</tr>
<tr>
<td>Mills ratio</td>
<td>-1.91*</td>
<td>-1.56</td>
</tr>
<tr>
<td>Constant</td>
<td>2.02</td>
<td>1.58</td>
</tr>
</tbody>
</table>

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