Disentangling the effects of organizational capabilities, innovation and firm size on SME sales growth

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Abstract:
This paper focuses on certain drivers of SME sales growth related to knowledge and innovation. Building on the dynamic capabilities literature, we test whether two organizational capabilities (external sourcing and employee involvement in renewal activities) predict sales growth, and if so, whether such effects are mediated by process and/or product innovation. Based on survey data from a panel study of Dutch SMEs, and controlling for several firm characteristics (firm size, sector, age and family business), we conclude that external sourcing has direct effects on both product and process innovation, with an indirect effect (mediated by process innovation) on sales growth. In line with our hypothesis development, we also find that employee involvement, while positively affecting process innovation, has a negative effect on sales growth. Firm size moderates the effects of two of the variables (external sourcing and product innovation) on sales growth, with more positive effects found for the smallest firms, results supporting the nimbleness (versus resource-based) view.

Keywords: SMEs, sales growth, dynamic capabilities, innovation, knowledge, empirical study, lead-lag effect

JEL Classification Codes: D22: Firm behavior: Empirical analysis; D83: Search, Learning, Information and Knowledge, Communication, Belief; L25: Firm Performance: Size, diversification, and scope; O31: Innovation and invention: Processes and incentives

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1. Introduction

Sales growth in small- and medium-sized enterprises (SMEs) is of widespread interest in economics and business research, but the drivers of such growth remain a source of debate (Dobbs and Hamilton 2007; Bahadir et al. 2009; Short et al. 2009; Stam and Wennberg 2009). The purpose of this paper is to enhance our ability to understand such drivers, focusing especially on factors related to knowledge and innovation.

The role of knowledge is a recurring theme in the literature on firm survival and growth. Furthermore, organizational practices or capabilities related to knowledge creation, acquisition, assimilation and application are central to several management theories including the resource-based view (Penrose 1959; Barney 1991; Wernerfelt 1984), dynamic capabilities (Geroski 1995; Grant 1996; Teece et al 1997; Teece 2007), knowledge management (Takeuchi and Nonaka 2004) and learning perspectives (Dobbs and Hamilton 2007; MacPherson and Holt 2007; Nelson and Winter 1982; Stuart 2000). According to the resource-based view, the firm's knowledge endowment strongly influences its direction and rate of growth (Penrose, 1959). Similarly, the dynamic capabilities and learning perspectives presume that the more knowledge is gained, the more associations can be made and, thus, the more effectively and quickly problems within the organization can be resolved (Cohen and Levinthal 1990; Eisenhardt and Martin 2000).[1] Although different measures of knowledge-related practices or capabilities are used in the literature, they are generally classified into external and internal aspects (Eisenhardt and Martin 2000; Takeuchi and Nonaka 2004; Jansen et al. 2005; Capron and Mitchell 2009; van Wijk et al. 2008). In this study, sampling from both aspects, we focus on two knowledge-related organizational capabilities that may

[1] Eisenhardt and Martin (2000) define dynamic capabilities as the "antecedent organizational and strategic routines by which managers alter their resource base—acquire and shed resources, integrate them together and recombine them—to generate new value-creating strategies" (Eisenhardt and Martin 2000, p. 1107)

affect a firm's sales growth: external sourcing (Capron and Mitchell 2009) and employee involvement in renewal activities (Eisenhardt and Martin 2000; Jansen et al. 2005).

Innovation is another recurring theme in the literature on sales growth. Based on an extensive meta-analysis of extant studies, Bahadir et al. (2009) conclude that innovation is one of the most consistent drivers of organic sales growth. However, current research focuses to a disproportionate extent on large firms (e.g., Bahadir et al. 2009). Furthermore, their meta-analysis does not differentiate among types of innovation (e.g., process versus product) or phases of the innovation process (input versus output). Different aspects of innovation may lead to different outcomes, as the meta-analysis carried out by Rosenbusch et al. (2011) illustrates. In this line, Freel and Robson (2004) demonstrate that process and product innovation may have different effects on sales growth and firm profitability. Sound conclusions about sales growth are further limited by the tendency to combine growth with other performance outcomes, assuming that all such outcomes are predicted by the same factors (e.g., Calantone et al. 2010; Rosenbusch et al. 2011).

A first contribution of our paper is an enhanced understanding of existing models of firm innovation and sales growth. Rather than assume, à priori that organizational capabilities function exclusively as innovation process inputs (e.g., Rosenbusch et al. 2011), we test whether innovation mediates the relationship between such capabilities and sales growth. We find different mediating effects between the two types of innovation outputs used. As such, our research findings not only add to our understanding of knowledge-based theories including the resource-based view and the dynamic capabilities perspective but also provide further insight into models of firm innovation and sales growth.

A second contribution of this research is to underscore the importance of taking size effects into account when predicting sales growth. We find that even within a rather narrow range of "small" enterprises—i.e., those with fewer than 100 employees—it is relevant to

consider size as a moderator variable. Our findings show that the smaller the firm, the more important product innovation and external sourcing appear to be in stimulating sales growth.

In the next section, we clarify our definition of organizational capabilities by referring primarily to the dynamic capabilities literature, and we present our framework and hypotheses. In the remainder of the paper, we present the methods, results, discussion and conclusions.

2. Framework and hypotheses

Organizational capabilities, as defined in our study, are those practices or routines that aim to acquire, reconfigure or assimilate knowledge for the firm (Capron and Mitchell, 2009; Lichtenthaler, 2011). In line with Capron and Mitchell (2009), Lichtenthaler (2011) and Caloghirou, Kastelli and Tsakanikas (2004), we focus on two types of organizational capabilities: external sourcing and employee involvement in renewal activities. *External sourcing* refers to practices that lead to the acquisition of knowledge outside the firm. They may include the use of an external network of contacts, such as universities, competitors, suppliers or advisors, as well as cooperation with other firms or institutions (De Jong and Vermeulen 2006). More formal alliances and partnerships with other firms may be introduced as well. We also include market research as a type of external sourcing.

Broadly speaking, *employee involvement* can be seen as a type of internal development or sharing capability. In the knowledge management literature, "internal sharing" refers to routines or practices that involve the exchange or transfer of knowledge among employees within the organization (Uit Beijerse 2000; van Wijk et al. 2008). Renewal activities refer to all kinds of intended changes or innovations in the firm, not just product innovation (DeJong and Vermeulen, 2006). *Employee involvement in renewal activities* thus refers to employee participation in both idea development and/or implementation of innovations, including both product and process changes.

The key focus of our research is to differentiate between effects of these two organizational capabilities on innovation versus sales growth—testing for mediating effects of innovation performance versus independent effects on sales growth. Thus, based on our reading of the literature, as shown in Figure 1, we propose that sales growth is predicted by both external sourcing (e.g., Littunen and Tohmo 2003; Van Wijk et al. 2008; Bahadir et al. 2009; Singh and Mitchell 2005) and employee involvement in renewal activities (e.g., Van Wijk et al. 2008; Rosenbusch et al. 2009), both directly and indirectly by way of product and process innovation (e.g., Sheremata 2000; van Wijk et al. 2008). Furthermore, as also shown in Figure 1, we propose that firm size moderates the relationship between each independent variable and sales growth. In the remainder of this section, we briefly present the rationale for each hypothesis.

| Insert Figure 1 about here |

2.1 Effects of innovation on sales growth

2.1.1. Product innovation and sales growth

In strategy research, a commonly stated (and tested) assumption is that competitive advantage is gained through the introduction of novelty or newness, as customers are more willing to pay premium rents for unique products and services (Freel 2005; Freel and Robson 2004; Johannessen et al. 2001). This serves as the underlying logic for linking product innovation with financial performance indicators—including sales growth (Storey 1994; Geroski and Machin 1993; Roper 1997; Johannessen et al. 2001). A steady stream of innovative products enables firms to gain early cash flows, to enhance external visibility and legitimacy, and to gain market share early (Schoonhoven, Eisenhardt and Lyman 1990; Banbury and Mitchell 1995; Chaney and Devinney 1992), thereby stimulating growth. Based on these arguments we propose:

H1a: Firms reporting product innovation are likely to report higher sales growth.

2.1.2. Process innovation and sales growth

In contrast to product innovation, which is market and customer oriented, process innovation often has an internal focus, typically aimed at improving the efficiency of producing and delivering a product or service (Utterback and Abernathy 1975; Damanpour and Gopalakrishnan 2001). Successful applications of process innovations require rather widespread changes in organizational structures and administrative systems (Ettlie and Reza 1992). Internal process improvements might involve changes in the materials used, task specifications, work and information flow mechanisms, or even the equipment related to the production and delivery of the outcome. The reengineering of manufacturing and/or delivery processes is likely not only to decrease costs, but also to increase product quality and reliability (Damanpour 1991; Gopalakrishna et al. 1999; Utterback 1994; Reischstein and Salter 2006). Both of these aspects may enhance market competitiveness and add value to customers, thereby increasing sales growth. We therefore propose that:

H1b: Firms reporting process innovation are likely to report higher sales growth.

2.2. Effects of external sourcing on innovation and sales growth

2.2.1. Effects of external sourcing on innovation

External networks and other formal relationships with external parties help a firm to acquire new knowledge and skills (Capron and Mitchell 2009; Caloghirou, Kastelli and Tsakanikas 2004; Littunen and Tohmo 2003). Such external knowledge can stimulate new products by enhancing a firm's own capacity to process and apply its own knowledge (Gupta and Govindarajan 2000; Van Wijk et al. 2008; Jansen, van den Bosch and Volberda 2005; Zahra and George 2002; Teece 2007). Partnerships and connections may also help the firm by cooperative efforts which lead to joint development and launch of new products and services, thus bringing innovations to market more quickly.

As a third aspect of external sourcing, market research is a specific tool used to collect and analyze external information, especially about consumer desires. Knowledge acquired via market research can serve as a basis for strategic choices made by the firm's decision maker(s) regarding which products or services to keep, add, or modify, as well as which benefits or features to emphasize in marketing. All these decisions can be incorporated into future product development. Thus, market research is an important means for user-driven innovation. Based on all the above arguments, we propose:

H2a: The more extensive the use of external sourcing, the more likely it will be that a firm reports product innovation.

In addition to knowledge relevant for new products, external sourcing can also provide the firm with ways of improving internal processes. Research by De Kok and Uhlaner (2001) provides empirical evidence that formal human resource management, especially formal training programs, is more likely in those small firms reporting alliances with larger firms, regardless of whether the larger firms are suppliers or customers. Such linkages reduce the transaction costs for developing such programs internally (Nooteboom 1993). Similarly, such alliances can reduce transaction costs in improving other types of internal processes. Market research may also provide input of new ideas related not only to new products but also to process improvements. We thus propose:

H2b: The more extensive the use of external sourcing, the more likely it will be that a firm reports process innovation.

2.2.2. Total and indirect effects of external sourcing on sales growth

Aside from the direct stimulation of new products and processes, the addition of knowledge from outside the firm can lead to fresh thinking and provide useful insights about how to exploit current competencies (Sheremata 2000; van Wijk et al. 2008). Information about existing or potential customers, competitor moves and technological advances may enable an

organization to evaluate the long-term potential of its *existing* product mix, marketing, operations or other internal organization processes, or otherwise enhance its ability to sense and react to its changing environment (Day 1994). Consistent with these assumptions, Rodan and Galunic (2004) find that about two-thirds of reported knowledge transfer is multidimensional, involving not only technical knowledge but also marketing and managerial knowledge.

Aside from providing the firm with new knowledge, external sourcing may stimulate sales growth by enhancing the firm's ability to acquire other tangible (i.e., financial assets) and intangible (i.e., social support and increased legitimacy) resources (Nicolaou and Birley 2003; Thether and Tajar 2008; Stuart 2000). Such resources can help the firm to gain customers and distribution channels, which in turn stimulate growth.

Considering these arguments regarding external sourcing and sales growth, we propose:

H3a: Firms reporting more extensive use of external sourcing are likely to report higher sales growth.

In the context of the previous hypotheses, the total effect of external sourcing may be both direct, as well as indirect by way of product and/or process innovation. Given the posited positive effect of product and process innovation on sales growth (Hypotheses 1a and 1b, respectively) and the posited positive effect of external sourcing on product and process innovation (Hypotheses 2a and 2b, respectively), it is logical to assume, furthermore, that innovation (product and process, respectively) mediates, at least partially, the relationship between external sourcing and sales growth. We thus propose, as corollaries to Hypothesis 3a, two hypotheses related to the indirect effects of external sourcing on sales growth with product and process innovation, respectively, as mediators:

H3b: Product innovation mediates the relationship between external sourcing and sales growth.

H3c: Process innovation mediates the relationship between external sourcing and sales growth.

2.3. Effects of employee involvement in renewal activities on innovation and sales growth

2.3.1. Effects of employee involvement in renewal activities on innovation

The social and organizational psychology literature supports the view that greater participation in decision making produces both higher quality and quantity of ideas (Diehl and Stroebe 1987; Thompson 2003). Furthermore, according to the dynamic capabilities perspective, such sharing builds a base of common knowledge, symbols and language among employees, which enhances a firm's performance (Grant 1996). In addition, employee involvement in renewal activities can support an innovative culture by keeping employees focused on new initiatives (Penrose 1959; Helfat 1994).

We thus propose:

H4a: Firms reporting employee involvement in renewal activities are also more likely to report product innovation.

H4b: Firms reporting employee involvement in renewal activities are also more likely to report process innovation.

2.3.2. Total and indirect effects of employee involvement in renewal activities on sales growth

Although employee involvement in renewal activities may have an indirect, positive effect on sales growth by way of product and process innovation, such involvement may also have a direct, negative effect on sales growth due to the added time and resources that group involvement typically requires (Zahra et al. 2006). To ensure sales growth, firms must often anticipate and quickly pursue emerging opportunities (Lumpkin and Dess 1996; Zahra et al 2000). Firms must also be able to access the appropriate manufacturing and marketing

techniques as well as distribution channels in a rapid and flexible way. In this context, delays may hinder success (Calantone et al. 2003). Given the importance of promptly sensing opportunities in the market (Zahra et al. 2000), employee involvement in renewal activities could be counterproductive unless those employees can provide significant additional knowledge not available to the director or other top decision makers in the firm. Desouza and Awazu's (2006) qualitative study examines the distribution of knowledge in a sample of small firms, and concludes that common knowledge runs deeply and broadly among employees. Furthermore, they find that most of the important knowledge required to spur growth already resides with the director. Thus, they question whether formal (or informal) techniques for sharing information provide competitive benefits for SMEs, counter to the situation in larger firms where coordinating the knowledge of employees and building a common knowledge base may not only pose a greater challenge but may also deliver more benefit to the firm (Desouza and Awazu 2006; Grant 1995; van Wijk et al. 2008).

Employee involvement in renewal activities may also slow the changes needed to ensure growth due to resistance to change, as employees may believe that the adoption of such changes will threaten their current status (Garud, Nayyar and Shapira 1997). In sum, the possible gain from new ideas derived from employee involvement may be more than offset by the additional costs of such involvement, as well as outright resistance to such changes. Hence, we propose:

H5a: Firms reporting employee involvement in renewal activities are likely to report lower sales growth.

In the context of the previous hypotheses, employee involvement in renewal activities may still have a positive indirect effect on sales growth by way of innovation. Although Desouza and Awazu (2006) question the value of employee involvement for innovation, given the posited positive effect of product and process innovation on sales growth (Hypotheses 1a and

1b, respectively) and the posited positive effect of employee involvement in renewal activities on product and process innovation (Hypotheses 4a and 4b, respectively), employee involvement may have a partial, indirect, positive effect on sales growth. As corollaries to Hypothesis 5a, we therefore propose that:

H5b: Product innovation (partially) mediates the relationship between employee involvement in renewal activities and sales growth such that the total effect of such employee involvement on sales growth will be less negative than the direct effect of such employee involvement on sales growth.

H5c: Process innovation (partially) mediates the relationship between employee involvement in renewal activities and sales growth such that the total effect of such employee involvement on sales growth will be less negative than the direct effect of such employee involvement on sales growth.

2.4. Moderating effects of firm size

2.4.1. Moderating effects of firm size on the innovation-sales growth hypotheses

The resource-based view (Penrose 1959) and the nimbleness view (Barringer and Jones 2004) offer different predictions regarding the potential moderating effects of firm size on the relationship between innovation outputs and sales growth. The resource-based perspective indicates that larger firms are likely to have more slack human resources and, as a result, have the advantage of greater management capacity, which can be used to enhance growth (Penrose 1959; Barringer and Jones 2004). In contrast, according to the nimbleness view, smaller firms can react more quickly because they are typically less burdened by bureaucracy. In the smaller firm, the CEO will have more influence on his or her staff, both directly and via internal routines and practices, which enables the firm to react more quickly (Miller and Toulouse 1986). Furthermore, this perspective suggests that the advantage of slack human resources is offset by a number of factors. First, in the larger firm, more resources must often

be used to socialize new managers to its culture, while other resources may be squandered by incumbent managers—more distant from the top director— in pursuit of personal versus firm priorities, such as growth. Second, there is a greater risk of moral hazard in larger firms as non-owning managers often acquire increasing power to make decisions affecting firm outcomes (Barringer and Jones 2004). Third, Mishina et al. (2004) find that slack human resources actually aggravate rather than reduce *stickiness* (i.e., firm's inability to transfer best practices internally within the firm (Szulanski, 1996)) especially under conditions of unpredictable product versus predictable market expansion. They argue that new product introduction is especially problematic because it requires the transfer of skills to new applications. Although they do not test this hypothesis for process innovation, we will make similar assumptions under those conditions of newness as well. All in all, these arguments suggest that whereas slack human resources may have advantages, they can also disadvantage a firm that is trying to innovate and move quickly in changing markets. Following the logic of the nimbleness perspective gives rise to the following hypotheses:

H6a: The relationship between product innovation and sales growth is moderated by firm size, such that the predicted positive effect of product innovation on sales growth is stronger for micro and small versus medium-sized firms.

H6b: The relationship between process innovation and sales growth is moderated by firm size, such that the predicted positive effect of process innovation on sales growth is stronger for micro and small versus medium-sized firms.

2.4.2. Moderating effects of firm size on the relationship between external sourcing and sales growth

Several benefits of external sourcing—especially social support, enhanced legitimacy, and the ability to look at problems in new ways and recognize opportunities—may be particularly useful in smaller firms where the firm director may lack colleagues internal to the firm who

can serve as sources for new ideas or as sounding boards. Furthermore, as discussed above, the nimbleness argument suggests that SMEs in particular may have an advantage over larger firms in that it is easier for the directors of smaller firms to translate new information into action. Consistent with this view, a study of small firms by Desouza and Awazu (2006), which draws primarily from cases, finds that SMEs have a knack for exploiting external sources of knowledge, and that larger organizations are less apt to exploit these same sources. We thus propose:

H6c: The relationship between external sourcing and sales growth is moderated by firm size, such that the predicted positive effect of external sourcing on sales growth is stronger for micro and small versus medium-sized firms.

2.4.3. Moderating effects of firm size on the relationship between employee involvement in renewal activities and sales growth

Finally, our general argument for the relationship between employee involvement and sales growth is based on the assumption that small firms differ from large firms in the benefits of employee involvement for sales growth (See Hypothesis 8). We presume that this is even more strongly the case for small firms within our overall SME sample. Hence, we propose:

H6d: The relationship between employee involvement in renewal activities and sales growth is moderated by firm size, such that the predicted negative effect of such employee involvement in renewal activities on sales growth is stronger for micro and small versus medium-sized firms.

3. Method

3.1. Data source and sample

Our data are drawn from telephone interviews with key informants (either the owner-manager or the general manager of the companies in question) (De Jong 2000, p. 15) of firms

participating in the Dutch SME policy panel, a longitudinal panel of firms with less than 100 employees. Data were collected at three points in time—1999, 2000, and 2002—by EIM Business and Policy Research (currently known as Panteia/EIM), a Dutch research firm, and funded by the Dutch Ministry of Economic Affairs. Participants of the panel were drawn from a source provided by the Dutch Chamber of Commerce. A stratified sample protocol was used to ensure that the sample's distribution among eight sectors (manufacturing, construction, trade, hotels and restaurants, transport and communication, business services, financial services, and personal services) was similar to the distribution in the overall population of Dutch SMEs. The sample was also stratified by size, with larger firms oversampled to ensure sufficient representation. Size was determined by the number of employees, with companies classified as: micro (0-9 employees), small (10-49) or medium (50-99). As one factor under investigation is employee involvement in renewal activities, the smallest firms (i.e. those with between 0 and 3 employees) were removed. The selection sample of firms that met the parameters above (size between 4-99 employees, participation in each of the three waves of data collection and provision of annual sales data for 1999-2002) included 318 firms. After removing companies with missing data for other variables, the final estimation sample was reduced to 229 firms.

To test for potential bias in the final estimation sample, we compared the starting pool of 1218 firms interviewed in 1999, which met the size criterion of between 4 and 99 employees, to the two samples already defined above—the selection sample of 318 firms and final estimation sample of 229 firms—according to both size and sector distribution (see Table 1). Size distributions are roughly comparable for the three groups, as are the distributions of the sectors, albeit with some notable exceptions. Especially when compared with the original pool of 1,218 cases from 1999, the final estimation sample tends to overrepresent manufacturing and construction, while underrepresenting financial services and

personal. To correct for this bias, sector dummy variables were included in the ensuing regression analyses.

| Insert Table 1 about here |

3.2. Individual items and scale construction

Table 2 contains descriptions of the individual items used in this study, as well as some descriptive statistics. As a first step towards reducing multicollinearity across items and in order to validate scales, items were reduced to scales where possible according to standard protocols, including factor analysis (using principal components extraction and Varimax rotation), Harman's single factor test for common method bias (Podsakoff and Organ, 1986), tests of reliability using the Cronbach's alpha reliability coefficient, a review of bivariate correlation and, finally, an analysis of face validity with respect to item content.

The results of the factor analysis are shown in Table 3. Although an eigenvalue of 1.0 typically serves as a cut-off, we found the six-factor solution shown to be more interpretable and it produced more reliable scales. Furthermore, the first factor explains less than 30% of the total variance, indicating a relatively low risk of common method bias according to Harman's single factor test.

Before combining items into scales, we also considered the objectives of the research. For instance, even though new product innovation items from 2000 and 2002 load on the same factor, we kept the items for different years separate to enhance our ability to test for delayed or lead-lag effects across years (Lo and McKinlay, 1990). We followed the same rationale for process innovation from 2000 and 2002. Finally, with respect to the fifth factor, even though the employee involvement and process innovation item for 1999 clearly loaded on the same factor (and are also highly correlated), we kept these items separate, as they reflected different phases in the innovation process (inputs versus output). The scales are described in more detail in section 3.3.

| Insert Tables 2 and 3 about here |

3.3 Variables

3.3.1. The dependent variable: average sales growth

Sales growth is based on the average of percentage change in sales (negative or positive) during three consecutive annual periods (1999-2000, 2000-2001 and 2001-2002).[2] Respondents were asked the following question: "Could you provide an indication of the sales turnover—excluding VAT (i.e., Dutch sales tax)—of your company in the previous year?" Average sales growth is expressed in percentage change (see Table 2). We use average sales growth over a three-year period because the impact of renewal activities, including innovation, on sales growth may be expected to be spread out over time.

3.3.2. Independent variables

Data for the independent variables were collected in 1999, 2000 and 2002.[3] The corresponding survey questions are listed in Table 2; all responses are binary (respondents could choose to respond with "yes" or "no"). The items for the study were originally developed by De Jong (2000).

External sourcing 1999 (Cronbach's alpha reliability coefficient = 0.57) is a three-item scale based on the mean of the standardized value of three items collected in 1999: market research, use of external networks and inter-firm cooperation. The scale was restandardized when used as a variable in multiple regression analyses to reduce multicollinearity with the interaction term. Although the acceptability of the reliability coefficient is borderline, all three items clearly load on the same factor and are conceptually

[2] Extreme values for individual periods—annual growths rates of more than 100% or less than -50%—were removed. In these cases, the average annual growth rate was computed over the remaining periods. By removing outlier values, we correct for business-cycle effects (i.e., years of incidentally high or low sales growth).

[3] The panel was not asked these questions in 2001.

consistent with the concept of external sourcing as described in the dynamic capabilities literature (see Capron and Mitchell 2009).

Employee involvement 1999 is a single item regarding the involvement of front-line employees in renewal activities. It is also based on data collected in 1999.

To test for various lagged intervals as well as a possible reverse effect, *product innovation* and *process innovation* indicators were developed for all three years (1999, 2000 and 2002). For product innovation, each yearly indicator is based the average of the following two items: 1) whether the firm introduced products new to its sector; and 2) whether the firm introduced products new to the Netherlands, both referring to the period of the last three years and focusing on newness outside the firm. Reliability for all three of the product innovation indicators for all three years is acceptable (product innovation 1999: $\alpha = 0.94$; product innovation 2000: $\alpha = 0.87$; product innovation 2002: $\alpha = 0.89$). To measure process innovation, respondents were asked whether their companies had introduced improvements or revisions in internal company process in the past three years. We substituted the 2000 measure for process innovation in sales growth prediction models due to the 1999 indicator's excessive skewedness and kurtosis, as well as its high correlation with employee involvement.[4] This created an additional year of overlap between process innovation and the sales growth variable (1999-2002).

3.3.3. Control variables

To obtain unbiased estimators for the effects of the independent variables, a number of control variables are also included in our regression model: (1) dummy variables for sectors, (2) firm size, (3) firm age, and (4) a family business indicator (see Table 2). Regarding sector control

[4] Despite a high correlation, low VIF scores (less than 2) were found when both items were included in the same regression analysis, indicating low multicollinearity. Furthermore, the contribution of each item to sales growth differed (negative for employee involvement and non-significant for process innovation, regardless of the order in which the items were entered into the model), suggesting the need to treat them as separate items. This is consistent with content analysis reflecting one item as input and the other as innovation output.

dummies, eight dummy variables were created (one for each sector). The hotel/restaurant sector was used as the reference group and thus omitted from the regression analyses to avoid overdetermination of the model. Typically, small firms grow at systematically higher rates than their larger counterparts (Almus 2002). The control variable, firm size, allows for structural growth differences between firms of different sizes. The natural logarithm of the number of full-time employees in year 1 (1999) (*firm size* (*ln*)) was used to measure firm size. Furthermore, young firms grow faster than old firms, a finding consistently supported in empirical research (Verhoeven 2004; Robson and Bennett 2001; Ostgaard and Birley 1996) including a recent, large-scale meta-analysis of organic sales growth (Bahadir et al. 2009). Therefore, we control for firm age using a logarithmic transformation (*firm age* (*ln*)) to offset skewedness and kurtosis in the distribution.

As the employee involvement question refers to unpaid family workers, we control for family business effects. In this study, the *family business* control variable (Cronbach's alpha coefficient = 0.87) was measured as the mean of three indicators, an approach that has been found to be more appropriate than a binary variable for SME samples (Uhlaner 2005). The items cover both family ownership and leadership characteristics (see Table 2).

3.4. Estimation methods

In all cases, the hypotheses were tested using ordinary least squares (OLS) multiple regression analyses. OLS assumes a normal distribution for variables, which was the case for all variables except employee involvement 1999 and process innovation 1999. However, there was no way to correct for skewedness due to the fact these were both single items based on binary scales. However, process innovation 2000 was substituted in the model for process innovation 1999 and provided more interpretable results. The main effects of the independent variables were initially tested in each case by assessing the two-tailed significance of the

unstandardized regression (b) weight in the regression analysis when included as the only independent variable together with the controls.

An initial test for mediating effects is used based on approaches by James and Brett (1984) and Baron and Kenny (1986) as follows: We first estimate three separate models: y=f(x), z=f(x) and y=f(z). We assume the presence of a mediating effect when the following requirements are met: a) a significant effect of x on y in the model y=f(x); b) a significant effect of x on z in the model z=f(x); and c) a significant effect of z on y in the model y=f(z). If one or more of these relationships are non-significant, we can argue that mediation is not supported. Furthermore, we estimate model: y=f(z,x). If the effect of z remains significant after controlling for x, but x is no longer significant when z is added to the model, we can argue there is a full mediation. If x is still significant, it supports a partial mediation.

To test for the significance of the mediating effect, a version of the Sobel test (Frazier et al. 2004) that included control variables as covariates was used. The significance of mediating effects was further tested using a bootstrapping test (Preacher and Hayes, 2008). The latter requires less rigorous assumptions regarding the normality of the distribution of variables and is thus more suitable, especially for tests including items with skewed distributions (i.e., employee involvement 1999). The bootstrapping technique also provides lower and upper limits for the coefficient for the indirect effect for specified confidence intervals (e.g. 95%, 99%). The bootstrapping technique delivered results for employee involvement similar to those obtained from the Sobel test. We therefore assume that our main results were not seriously affected by skewedness of the employee involvement variable.

Following suggestions of Frazier et al (2004), to test for the moderating effects of firm size, we first created an interaction term based on the product of the two variables thought to interact. To reduce multicollinearity, standardized scores were used for the main effects and for computation of the product score. Tests of interaction effects were based on the

significance of the unstandardized regression weight, as well as a test of the significance of ΔR^2 for the interaction term when added to the full model of main effects and controls. Given multicollinearity concerns, each interaction term was tested in a separate model. In addition to this approach, variance inflation factors (VIF) were also examined to check for multicollinearity among the predictor variables.

4. Results

This section presents results of the data analysis. The bivariate statistics are presented first, followed by the results of the multiple regressions predicting average sales growth.

4.1. Bivariate statistics

Table 4 presents the intercorrelation matrix for all variables with the exception of sector dummy variables.[5] An inspection of the data shows positive significant relationships between average sales growth (1999-2002) and both process innovation 2000 ($p < 0.01$) and external sourcing 1999 ($p < 0.05$). Average sales growth is negatively associated with employee involvement 1999 ($p < 0.05$) and firm age (ln) ($p < 0.01$). Variables involved with interactions were first converted to standardized scores in order to verify that all resulting VIF scores remain at acceptable levels. Across all regression models reported in the study, no VIF scores exceed 3.0, and no VIF scores related to independent variable effects or interaction terms exceed 2.0.[6] As these results are well within the bounds of currently accepted standards (VIF < 10.0), they lend support to the conclusion that the variables in the models are free from multicollinearity (Hair et al. 2006).

Insert Table 4 about here

4.2. Formal tests of the hypotheses

[5] Data available from the authors.

[6] More detailed data on the VIF scores are available upon request.

Table 5 presents results of multiple regression analyses for all hypotheses with average sales growth as the dependent variable, including main effects (H1a, H1b, H3a, and H5a) and interaction effects of firm size (H6a, H6b, H6c, and H6d). Table 6 covers the models that either predict product innovation (1999, 2000 and 2002) (H2a and 4a) or process innovation (1999, 2000 and 2002) (H2b and 4b). In that table, we show results for multiple years of the dependent variable to get an approximate idea of both lead-lag and reversed effects. In particular, figures that show a stronger effect for 1999 than for later years may indicate either reverse causality or some other source of co-variance, as 1999 indicators refer to activity in the past three years (1997-1999). Finally, Table 7 provides a summary of tests for indirect vs, direct effects for each organization capability on average sales growth by way of product and process innovation (H3b, H3c, H5b and H5c).

Figure 2 provides a summary of all results. It includes a list of all six hypotheses, the predicted direction or type of effect (direct or indirect), whether the hypothesis is supported, and the table and model(s) in which the relevant analysis is presented. We review the results in the same order in the remainder of this section.

| Insert Figure 2 about here |

4.2.1. Tests of effects of innovation on sales growth

Model 1 in Table 5 presents the results of the regression of controls on average sales growth. These variables provide a baseline that explains about 14% (10% adjusted) of the total variance of average sales growth ($p < 0.001$). As expected, firm age is negatively related to firm growth, i.e., younger firms grow faster than older firms ($p < 0.001$). Neither firm size nor family business predicts average sales growth. In terms of sectors, firms in the transportation sector are more likely to reach higher average sales growth in the sample period, but only at the trend level ($p < 0.1$), as compared with firms in the hotel and restaurant sector (the benchmark for the remaining sector dummy variables).

Models 2 and 3 of Table 5 provide the results of the tests of Hypotheses 1a and 1b, respectively. Although product innovation 1999 explains an added 1% of the variation, after the controls, this does not represent a statistically significant difference. Process innovation 2000 (covering innovations from 1998-2000) explains 4% of the variance ($p < 0.01$) in average sales growth from 1999 to 2002.[7] The findings thus support H1b but not H1a.

| Insert Table 5 about here |

4.2.2. Tests of effects of external sourcing on innovation and sales growth

In Table 6, we use 2000 and 2002 data to test the effects of external sourcing on innovation (H2a and H2b; see Table 6, Models 2, 3, 5 and 6). However, we also include the prediction of process innovation 1999 and product innovation 1999 for comparison purposes (and to check for reverse causality). From Models 2 and 3 in Table 6, we see that external sourcing 1999 has a strong positive association with both product innovation 2000 ($p < 0.001$) and product innovation 2002 ($p < 0.001$), which supports Hypothesis 2a. As shown in Models 5 and 6 of Table 6, external sourcing 1999 is also positively associated with process innovation, with the strongest effect evident for process innovation 2000 ($p < 0.001$). External sourcing is also statistically significantly and positively associated with process innovation 2002 ($p < 0.01$). These findings support Hypothesis 2b.

Model 4 in Table 5 provides the results of the test of Hypothesis 3a, predicting a positive association between external sourcing and sales growth. External sourcing 1999 explains 2% of the variation of average sales growth after the controls ($p < 0.05$). However, an examination of Model 6 (Table 5), shows that external sourcing 1999 is somewhat less predictive of average sales growth ($p < 0.1$) when included in the full main-effects model together with process innovation and product innovation. Consistent with predictions made in

[7] In an analysis not shown, process innovation 1999 does not explain significant variance in average sales growth. Given the lack of a normal distribution and a high correlation with employee involvement 1999, we decided it

H3b and H3c, the decline in the unstandardized regression weight between Models 4 and 6 suggests that external sourcing and average sales growth are mediated by one or both of the innovation variables (Baron and Kenny, 1986), a conclusion that is confirmed by the Sobel Test and bootstrapping techniques reported in Table 7.

| Insert Tables 6 and 7 about here |

Although we also show results in Table 7 for product and process innovation for all three years, given the time spans covered, it is reasonable to focus primarily on the innovation indicators for the year, 2000. With respect to H3b, evidence for the mediating effect of product innovation is weak. The direct effect of external sourcing 1999 on average sales growth remains significant (and not much smaller than the total effect) when product innovation 2000 is used as the mediator ($p < 0.05$). Furthermore, the direct effect of product innovation 2000 (as the mediator) on average sales growth (as the dependent variable) is non-significant. Note that in this case, also, using a 95% confidence interval, the lower estimate of the indirect effect generated by the bootstrapping technique is negative (-0.33) (see Table 7).

Much stronger support is found for mediation effects of process innovation 2000 (H3c) with respect to external sourcing and average sales growth. In the Sobel test, whereas the total effect of external sourcing 1999 on average sales growth is significant ($p < 0.05$), the direct effect of external sourcing 1999 on average sales growth is non-significant when mediated by process innovation 2000. The other necessary links are also significant (IV to mediator and mediator to DV). Furthermore, the bootstrapping technique shows a bias-corrected 99% confidence interval of 0.056 to 2.57 for this indirect effect, with the lower and upper limits above zero. Taken together, such results clearly support H3c but not Hypothesis H3b.

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would be better to use the Process Innovation 2000 indicator in the model.

4.2.3. Tests of effects of employee involvement in renewal activities on innovation and sales growth

As shown in Table 6 (Models 1, 2, and 3), employee involvement 1999, measuring employee involvement in renewal activities, is positively related to product innovation 1999 but only at the trend level ($p < 0.1$), and it is neither associated with product innovation 2000 nor product innovation 2002. This may suggest that the 1999 result is due to co-variance or even a reverse effect (i.e., firms introducing new products may involve employees in introducing the change). Thus, we conclude that H4a lacks adequate support. In contrast, although the strongest finding for the relationship between employee involvement 1999 and process innovation relates to process innovation 1999 (which in large part, likely reflects co-variance, rather than a causal relationship), we still find a significant positive effect of employee involvement 1999 on process innovation 2000 ($p < 0.05$) and process innovation 2002 ($p < 0.05$). These findings provide support for a forward (lead) effect in the predicted direction and therefore support H4b.

Employee involvement 1999 and average sales growth are negatively associated ($p < .05$), which supports the prediction made in H5a. When using process innovation 2000 as mediator, the Sobel test results indicate that employee involvement 1999 has both a significant negative total effect and a significant negative direct effect on average sales growth. Nevertheless, the significant shrinkage in the size of the coefficient, especially when comparing the direct and total effects (Sobel coefficients of -8.99 for the direct effect and a negative 6.68 for total effect), together with the positive upper and lower limits of the coefficient (4.93 and 0.01, respectively at 99% confidence interval; 4.04 and .31, respectively at 95% confidence interval) for indirect effects of employee involvement 1999 on average sales growth support the conclusion that employee involvement 1999 also has an indirect *positive* effect on average sales growth by way of process innovation 2000. This supports

H5c. The data support a similar conclusion for product innovation 2000 as mediator but only at the 95% level, which nevertheless, provides moderate support for H5b.

4.2.4. Tests of moderating effects of size (H6a, H6b, H6c, and H6d)

The results for Model 7 (Table 5) report a negative, statistically significant, coefficient of the interaction term between product innovation and firm size ($p < 0.01$). This indicates that the effect of product innovation on average sales growth declines as firm size increases. Figure 3 shows a plot of this interaction with a positive slope for innovation and average sales growth in micro and small firms (one standard deviation below the mean value), and a negative slope for innovation and average sales growth for medium-sized firms (one standard deviation above the mean value). In Model 8 of Table 5, we find that firm size also negatively moderates the effect of process innovation on average sale growth. However, the unstandardized regression weight is only at the trend level ($p < 0.1$). Nevertheless, the plot in Figure 4 again suggests that process innovation has a more positive effect for smaller firms than for medium-sized firms. The results thus support H6a but only weakly support H6b (but in the predicted direction).

| Insert Figures 3 and 4 about here |

In support of H6c, as shown in Table 5 (Model 9), firm size (ln) negatively moderates the effect of external sourcing 1999 on average sale growth ($p < 0.05$). Thus, the effect of external sourcing 1999 on average sales growth appears greater for micro and small firms than for medium-sized firms. We again find consistent results in the graph shown in Figure 5, which indicates a clearly positive slope between external sourcing 1999 and average sales growth in micro and small firms, and a slightly negative slope for medium-sized firms.

| Insert Figure 5 about here |

As shown in Model 10 of Table 5, the interaction term for firm size and employee involvement, although negative as predicted, is nonsignificant (b = -0.12, ns), adding no explained variance to the overall model of average sales growth. Thus H6d is not supported.

5. Discussion

5.1. Initial discussion

The intent of this paper is to extend our understanding of factors that may help to explain variation in small- and medium-sized firms' average sales growth, especially factors related to knowledge and innovation. In this regard, recent meta-analyses stress the inconclusive nature of existing research and call for further investigation (Dobbs and Hamilton 2007; Bahadir, Bharadwaj and Parzen 2009; Short, McKelvie, Ketchen and Chandler 2009; Stam and Wennberg 2009). In the introduction to our paper, we outlined the main assumptions underlining our research. Sales growth is presumed to be positively affected by external sourcing by enhancing the firm's understanding of the outside world, and also by innovation outputs, including process and product innovation. Based on the nimbleness argument, however, employee involvement is predicted to have a positive effect on innovation but a negative effect on sales growth.

Our first set of findings address the relationships between innovation (process and product) and sales growth. More specifically, we find that improvements in internal processes (process innovation) are more likely to explain differences in sales growth rates among SMEs than the introduction of new products and services (product innovation). The different results for process and product innovations in our research and in previous work further confirm the importance of considering these two dimensions separately (Freel and Robson 2004). Process innovation may have an advantage over product innovation in spurring firm growth, in part, due to its tacit nature; the changes are often more deeply embedded in the organization's structure and systems, and thus less easily understood and copied by others (Gopalakrishnan

et al. 1999; Wong et al. 2008). Such embeddedness also adds to the complexity of product innovation (Lippman and Rumelt 1982), making it more difficult for competitors to determine which aspects truly add value and should therefore be imitated (Lippman and Rumelt 1982; Gopalakrishna et al. 1999). As such, therefore, it may be easier to keep the value-added characteristics of process innovations secret (Levin et al. 1987). In contrast, successful product innovations are more visible and thus potentially more easily "reverse engineered" by competitors. The success or failure of a product innovation is also more apparent.

Our findings regarding process innovation are only partially confirmed by other recent research on SMEs. For instance, Freel and Robson (2004) report a positive effect of *incremental* process innovation on sales growth for service firms but a negative effect of *novel* process innovation for manufacturing. However, they temper their conclusions by noting that their study has a short time lag. A study of manufacturing SMEs by Wolff and Pett (2006) also fails to link process innovation with sales growth, but results of that study may be affected by a confounding of the growth and product innovation measure, which appear to overlap in meaning, unlike the measures in the present research.

The absence of a positive relationship between product innovation and sales growth, on the other hand, appears to corroborate fuzzy results obtained in previous research. Studies supporting the claim that new product introduction and sales growth are positively linked are often sector specific, and focus on such sectors as biotechnology (Hall and Bagchi-Sen 2002), seafood retailers (Bhaskaran 2006), industrial chemicals (Soni, Lilien and Wilson 1993), and office and residential furniture (Calantone et al 1995). The range of sales growth being predicted may also account for some of the differences in past results. For example, Freel (2000) finds that innovators exceed non-innovators only in the "super-growth" (i.e., the highest quartile) category, a finding confirmed in a more recent study by Coad and Rao (2008). However, in another study of SMEs in which a broader range of sales growth is

predicted, Freel and Robson (2004) find a non-significant relationship between product innovation and sales growth for service businesses, and a negative effect of product innovation on sales growth for manufacturing firms.

Our second set of findings, confirming the importance of external sourcing as an explanation for sales growth is more consistent with other research (e.g., Littunen and Tohmo 2003; Van Wijk et al. 2008; Bahadir et al. 2009; Singh and Mitchell 2005). However, our findings suggest that this is primarily caused by indirect effects of external sourcing by way of process innovation. The positive effect of external sourcing on process innovation suggests that external sourcing may support fresh thinking and provide useful insights into ways of exploiting current competencies (Sheremata 2000; van Wijk et al. 2008). Supporting this conclusion indirectly, Bahadir et al. (2009) posit that the relationship between marketing orientation (which overlaps conceptually with aspects of external sourcing, especially market research) and sales growth is mediated by innovation. However, they do not report specific findings to this effect.

Our third set of findings calls attention to the complexities faced by small firms in fostering sales growth as they add employees. Our results confirm both positive and negative effects of employee involvement in renewal activities on different aspects of performance. In particular, employee involvement has a clearly negative effect on sales growth, while it has a neutral to positive effect on both process and product innovation. The very strong correlation between employee involvement in renewal activities and process innovation for the same time period, however, suggests that there may also be a two-way or reverse causality between the two variables, indicating that employee involvement in renewal activities may also be an inherent part of the implementation of process improvements.

Meta-analyses of intra-organization knowledge transfer by Van Wijk et al. (2008) and Rosenbusch et al. (2009) reveal a positive effect for intra-organizational knowledge transfer

and firm performance. However, they do not adequately control for differences in firm size, or for differences in the measurement of the independent and dependent variables. We find that employee involvement in renewal activities (a type of internal knowledge sharing) actually has a negative impact on sales growth, which is consistent with predictions drawn from Desouza and Awazu's (2006) study of small firms. Sales growth requires firms to access and apply appropriate manufacturing techniques, marketing techniques, and distribution channels, both rapidly and flexibly (Calantone et al. 2003). However, employee involvement may slow this process, as employees may resist change (Garud, Nayyar and Shapira 1997), which in turn consumes additional organizational resources (Zahra, Sapienza and Davidsson 2006). This negative effect underscores the costs that may be incurred from using participative decision making when it adds only limited value to the development of new ideas.

Our final set of findings relates to the moderating effects of firm size on the previously tested relationships. We present two contrasting arguments for moderating effects of firm size on the relationship between innovation and sales growth: slack resources and nimbleness. Our results tend to confirm the second argument—smaller firms reporting innovation (product and process) are more likely to reach higher sales growth than medium-sized firms. This may be explained by the magnified bureaucracy and moral hazards associated with increased size (Barringer and Jones 2004). These findings suggest the need for some caution in adapting a universal approach to innovation as a competitive strategy, at least for SMEs. Product innovation does not equally benefit all firms. Second, our results confirm the moderating effect of firm size on the relationship between external sourcing and average sales growth. Again, the nimbleness argument is supported. Stuart (2000) finds that small firms, in particular, benefit from alliances with large, established partners with higher sales growth, and suggests that this may be due, in part, to the benefits of legitimacy gained from such linkages. Small firms may also be less likely to have the internal resources needed to compensate for a

lack of external networks. However, the moderating effect of firm size on the relationship between employee involvement in renewal activities and average sales growth is not confirmed by our results. One possible reason is that even in the medium-sized firms in our sample, there may be insufficient specialized knowledge among employees to warrant the costs of their involvement. Clearly, further research is needed to better understand how knowledge is distributed in the SME, and in turn, the conditions, including the types of decisions, for which participative decision-making (especially in change efforts) is beneficial. Nevertheless, our findings regarding the moderating effect of firm size with respect to the three other predictors underscore the importance of examining patterns of results separately for different sized firms, before drawing general conclusions.

Finally, another important contribution of our research comparing the current study to most research on this topic is that, in this study, a number of control variables are included in the same analysis (firm size, age, family business and sector). Furthermore, we examine lead-lag effects of organizational capabilities on innovation and average sales growth over a four-year period.

5.2. Limitations and directions for future research

We explore limitations and directions for future research in this section. A number of improvements may enhance our understanding of sales growth in SMEs. First, we recognize that binary (yes-no) items are limiting with respect to the depth of information obtained. For example, the external sourcing measures used for the present study do not address the intensity or nature of relationships, such as relationships with external parties. With respect to innovation, we do not distinguish between incremental and radical innovation. It may also be more important to measure not only whether innovations are introduced but also whether they are commercially successful (Freel and Robson 2004; Audretsch 1995). We do, however,

eliminate new-to-firm innovation in order to focus on product and service innovation either new to the sector or to the region (i.e., the Netherlands).

Second, although we did check for some lead-lag effects in order to obtain more insight in the causal direction of our estimated relationships, a more precise estimate of lead-lag effects was not possible due to the wording of a number of the items (especially items asking about the past three years). Future research could pay attention to such issues as well as benefit from a longer time period for data gathering (Freel and Robson 2004).

Furthermore, the conclusions of the current research are based on Dutch SMEs. In order to generalize our findings to SMEs elsewhere, it would be useful to sample firms from outside the Netherlands. Rosenbusch et al. (2011), for example, find that national culture is a significant moderator of effects between innovation and firm performance, with countries characterized by low individualism benefiting more from the innovation variable.

Finally, to explore the full range of size effects, it would be helpful to include larger SMEs. Despite these limitations, the current study provides several avenues for future research.

5.3. Practical implications

The findings presented here have three practical implications. First, in light of our results and those reported in our literature review, it may be time to reconsider the widespread supposition that innovation is essential to competitive advantage and sales growth. Given the moderating effects of size and the lack of main effects, product innovation as a general prescription for sales growth may be ill advised. Second, process innovation is likely to have a more widespread benefit than product innovation (and is less likely to have negative consequences for larger SMEs, although the positive benefits are likely to be weaker). The third and most important practical implication of the current study is that SME sales growth is likely to benefit most from practices that allow the SME to exchange or acquire external information and/or otherwise work with outside institutions or firms on renewal projects.

Policy makers interested in stimulating firm growth may best do so by encouraging knowledge diffusion to SMEs from other organizations and among SMEs themselves. Firms should be encouraged to participate in networks (encompassing universities, competitors, suppliers and advisors), to use market research and to cooperate with other firms.

6. Conclusions

The purpose of the present research was to identify key factors associated with sales growth. In particular, we focused on factors related to the creation and sharing of knowledge and innovation. A first contribution of our paper is an enhanced understanding of such factors, especially in the small firm. On the basis of data from a panel study that allows for analyses of lead-lag effects, we conclude that external sourcing—including involvement in external networks for the exchange of knowledge, cooperation with other companies or institutions to carry out renewal projects, and market research (either internal or outsourced)—has cumulative and direct benefits for both product and process innovation, as well as indirect benefits (mostly by way of process innovation) for sales growth. Although we rely on survey data, the use of lead-lag effects enhances the likelihood that such links are causal in nature. In contrast, employee involvement in renewal activities, which is widespread among SMEs, appears to have a positive effect on process innovation, but negative consequences for sales growth. Taken together, our findings are consistent with certain aspects of the resource-based view, and the dynamic capabilities perspective. However, these perspectives do not adequately explain the differences in effects of certain organizational capabilities on sales growth. The current research demonstrates the importance of examining each capability individually, for its potential (positive and/or negative) effects on firm performance. Our findings with respect to innovation and sales growth further underscore the need to examine specific effects on different types of outcomes (i.e. process versus product innovation, and

innovation versus financial performance), rather than assume they are all aspects of the same underlying construct (i.e. firm performance).

A second contribution of our research is to underscore the importance of taking size effects into account when predicting sales growth. The moderating effects of firm size suggest that, in contrast to the resource advantages of larger firms, nimbleness may play a more important role in ensuring that product innovation (and external sourcing) translates into sales growth in a timely way. These findings indicate that researchers should be cautious about inferring how the small firm can best be managed from samples of large firms. Furthermore, they suggest that even among SMEs, there is a major difference between the management of the very small (less than ten employees) and even moderately small (i.e., between 50 and 100 employees) firms, a difference that has not been adequately addressed in the literature.

Finally, the importance of external sourcing as a key organization capability may provide one additional piece to the knowledge paradox puzzle outlined by Audretsch and Keilbach (2008). Knowledge does not just "spill over" from one organization to the next. The resource-based view recognizes that managers function as a catalyst to convert a firm's knowledge to new product and process applications (Penrose, 1959; Kor and Mahoney 2004). Audretsch and Keilbach (2008) also note that people must serve as conduits if such knowledge is to be translated into commercial opportunity. External sourcing may be the mechanism they use for doing so. Future research would benefit from examining more precisely the interaction of individual characteristics of key players and the tools and practices they use to achieve innovation and firm growth.

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Table 1: Distribution of firms over sectors and size classes

	Full 1999 sample (n=1218)[a]		Selection sample (n=318)[b]		Final estimation sample (n=229)[c]	
Sector	Observations	Share of total (%)	Observations	Share of total (%)	Observations	Share of total (%)
Manufacturing	198	16.3	65	20.4	46	20.1
Construction	177	14.5	61	19.2	44	19.2
Trade	222	18.2	58	18.2	44	19.2
Hotels and restaurants	123	10.1	30	9.4	26	11.4
Transport and communication	110	9.0	31	9.7	21	9.2
Business services	134	11.0	34	10.7	24	10.5
Financial services	166	13.6	28	8.8	16	7.0
Personal services	88	7.2	11	3.5	8	3.5
Size class	Observations	Share of total (%)	Observations	Share of total (%)	Observations	Share of total (%)
Micro firms (0-9 employees)	342	28.1	83	26.1	64	27.9
Small firms (10-49 employees)	587	48.2	147	46.2	104	45.4
Medium-sized firms (50-99 employees)	289	23.7	88	27.7	61	26.6

a: This sample includes the distribution of all companies interviewed in 1999 with between 4 and 100 employees.
b: This sample reflects the subgroup of firms from the overall sample for which sales data is available. The substantial reduction in cases is due to the fact that respondents had to participate in each of the three years under study (1999, 2000, and 2002) and provide sales data.
c: This is the actual sample upon which estimations are based in the present research. Shrinkage is due to missing data for one or more control or independent variables in the model.

Table 2: Variable labels and survey questions (n=229)

Item	Question	% yes	Mean (SD)	Range of values
Independent Variables				
External sourcing 1999				
Market Research	Did your company perform (or outsource) market research over the past three years? (1999)	45%	0.45 (0.50)	0-1
Use of external networks	Does your company use an external network for the exchange of knowledge, for instance through universities, competitors, suppliers or advisers? (1999)	57%	0.57 (0.50)	0-1
Inter-firm cooperation	Does your company cooperate with other companies or institutions to carry out renewal projects?(1999)	56%	0.56 (0.50)	0-1
Employee involvement 1999	Are your employees (including unpaid family workers and owner/managers) involved in renewal activities?(1999)	91%	0.91 (0.28)	0-1
Innovation variables: Process Innovation				
Process innovation_1999	Did your company introduce improvements or renewal in internal company processes in the past 3 years?	91%	0.90 (0.28)	0-1
Process innovation_2000	Did your company introduce improvements or renewal in internal company processes over the past 3 years?	85%	0.85 (0.36)	0-1
Process innovation_2002	Did your company introduce improvements or renewal in internal company processes in the past 3 years?	78%	0.78 (0.42)	0-1
Product innovation				
New product in _sector_1999	Did your company put new products or services on the market in the past 3 years, new to your sector? (asked in year 1)	28%	0.29 (0.45)	0-1
New product in Netherlands_1999	Did your company put new products or services on the market in the past 3 years, new to the Netherlands? (asked in year 1)	24%	0.24 (0.43)	0-1
New product in _sector_2000	Did your company put new products or services on the market in the past 3 years, new to your sector? (asked in year 2)	31%	0.31 (0.46)	0-1
New product in Netherlands_2000	Did your company put new products or services on the market in the past 3 years, new to the Netherlands? (asked in year 2)	21%	0.21 (0.41)	0-1
New product in _sector_2002	Did your company put new products or services on the market in the past 3 years, new to your sector? (asked in year 4)	21%	0.21 (0.41)	0-1
New product in Netherlands_2002	Did your company put new products or services on the market in the past 3 years, new to the Netherlands? (asked in year 4)	14%	0.14 (0.35)	0-1

Item	Question	% yes	Mean (SD)	Range of values
Dependent variable				
Average Sales growth	Average of sales growth from 1999 to 2000; 2000 to 2001, and 2001 to 2002.		6.77 (12.28)	-23.65 to 51.82%
Control variables				
Family business				
Family ownership	Are more than half of the shares in hands of one family?(2000)	78%	1.78 (0.42)	1-2
Family leadership_1	Is the management in the hands of one or more members of the owning family?(2000)	74%	1.74 (0.44)	1-2
Family_leadership_2	Is at least half of the management made up of members of the owning family? (1=less than half, 2=precisely half; 3= more than half)(2000)		2.34 (0.92)	1-3
Age of firm	Age of firm (Measured in 2002)		28.63 (26.31)	4-162
Firm size	Employment in 1999		33.28 (27.92)	4-99
Sector dummies				
Manufacturing	Manufacturing Dummy variable	20%	0.20 (0.40)	0-1
Construction	Construction Dummy variable	19%	0.19 (0.40)	0-1
Retail/Wholesale	Retail/Wholesale Dummy variable	19%	0.19 (0.40)	0-1
Hotel and restaurant	Hotel and restaurant Dummy variable	11%	0.11 (0.32)	0-1
Transportation	Transportation Dummy variable	9%	0.09 (0.29)	0-1
Business services	Business services dummy variable	10%	0.10 (0.31)	0-1
Financial services	Financial services dummy variable	7%	0.07 (0.26)	0-1
Personal services	Personal services dummy variable	3%	0.03 (0.18)	0-1

Table 3: Factor analysis[a]

	Product innovation 2000/2002	Family business	Product innovation 1999	External sourcing 1999	Employee involve-ment 1999	Process innovation 2000/ 2002
1.Market research	0.30	-0.02	-0.03	**0.69**	0.12	0.05
2.Use of external networks	0.04	-0.06	0.18	**0.61**	-0.02	0.32
3. Inter-firm cooperation	0.07	-0.13	0.07	**0.76**	0.13	0.08
4. Employee involvement 1999	0.02	-0.02	0.15	0.13	**0.83**[b]	0.13
5. Process innovation 1999	0.08	-0.03	-0.09	0.07	**0.86**[b]	0.12
6. Process innovation 2000	0.11	-0.03	0.02	0.27	0.10	**0.80**[c]
7. Process innovation 2002	0.12	-0.15	0.03	0.08	0.19	**0.81**[c]
8. New products in sector, 2000	**0.79**[c]	-0.02	0.16	0.07	0.01	0.23
9. New products in Netherlands 2000	**0.82**[c]	0.01	0.20	0.09	0.02	0.11
10. New products in sector, 2002	**0.75**[c]	-0.21	0.25	0.13	0.09	-0.00
11. New products in Netherlands 2002	**0.82**[c]	-0.15	0.16	0.18	0.03	-0.00
12. New products in sector, 1999	0.36	-0.09	**0.88**	0.09	0.04	0.06
13. New products in Netherlands 1999	0.38	-0.05	**0.88**	0.12	0.03	0.02
14. Family ownership	-0.13	**0.85**	-0.07	0.01	0.01	-0.01
15. Family leadership_1	-0.05	**0.91**	-0.08	-0.07	-0.08	-0.15
16. Family leadership_2	-0.09	**0.88**	0.01	-0.17	0.00	-0.05
Eigenvalue	4.80	2.18	1.88	1.14	0.96	0.90
Percentage variance explained	29.97	13.62	11.75	7.10	6.01	5.63

[a] Principal component analysis with varimax with Kaiser normalization, six components extracted. N=229. Highlighted items are included in the factor. Rotation converged in six iterations

[b] Although these two items load on the same factor, they represent different phases in the innovation process (input and output) and are thus not combined into the same scale.

[c] To test for lead-lag effects, items from different years are not combined into the same scale.

Table 4: Correlations [a]

	1	2	3	4	5	6	7	8	9	10	11	12
1. Average Sales growth												
2. Product innovation 1999 [b,d]	0.10											
3. Product innovation 2000 [b,d]	0.11	0.50**										
4. Product innovation 2002[b,d]	0.09	0.53***	0.58***									
5. Process innovation 1999 [b]	-0.01	0.03	0.09	0.11^{+}								
6. Process innovation 2000[b]	0.19**	0.14*	0.24***	0.17*	0.22***							
7. Process innovation 2002[b]	0.15*	0.14*	0.18**	0.22***	0.24***	0.49***						
8. External sourcing 1999 [b, d]	0.15*	0.28***	0.30***	0.33***	0.19**	0.40***	0.32***					
9. Employee involvement 1999[b]	-0.15*	0.15*	0.14*	0.11^{+}	0.51***	0.22***	0.24***	0.25***				
10. Firm age (ln)[c]	-0.29**	-0.06	-0.11^{+}	-0.03	0.06	-0.05	-0.06	0.02	0.07			
11.Firm size (ln) [b,c]	-0.06	0.02	0.05	0.13*	0.08	0.16*	0.26***	0.33***	0.10	0.29***		
12. Family Business [d]	-0.11^{+}	-0.15*	-0.16*	-0.24***	-0.07	-0.14*	-0.20**	-0.22***	-0.09	0.09	0.26**	
Cronbach's-α reliability coefficient		0.94	0.87	0.89				0.57				0.87
Mean	6.77	0.00	0.00	0.00	0.00	0.85		0.00	0.91	3.00	3.12	0.00
Standard Deviation	12.28	1.00	1.00	1.00	1.00	0.36		1.00	0.28	0.84	0.93	0.89

Two-tailed: $^{+}$: $p < 0.10$ *: $p < 0.05$; **: $p < 0.01$; N=229.

[a] Table reports Pearson Product-Moment correlation coefficients.

[b] Converted to standardized score when used in regression analyses.

[c] Age and size are converted to a natural logarithm (ln) of the original value.

[d] This scale is based on the average of standardized item scores.

Table 5: Models of sales growth

	Control variables	Controls + Product innovation 1999	Controls + Process innovation 2000	Controls + external sourcing 1999	Controls + Employee Involvement 1999
	Model 1	Model 2	Model 3	Model 4	Model 5
Control variables					
Firm age (ln)	-3.60*** (0.72)	-3.57*** (1.01)	-3.26*** (1.00)	-3.46*** (1.00)	-3.51*** (1.00)
Firm size (ln)[a]	0.07 (0.88)	0.09 (0.88)	-0.31 (0.87)	-0.49 (0.90)	0.18 (0.87)
Family business	-1.01 (0.92)	-0.87 (0.92)	-0.75 (0.90)	-0.72 (0.92)	-1.17 (0.91)
Manufacturing	-1.99 (2.94)	-2.61 (2.99)	-2.23 (2.89)	-3.18 (2.95)	-1.15 (2.93)
Construction	0.23 (3.00)	-0.00 (3.00)	0.11 (2.94)	-0.03 (2.97)	0.57 (2.97)
Trade	3.28 (2.92)	2.91 (2.94)	3.82 (2.87)	1.91 (2.95)	4.00 (2.91)
Transportation	6.61+ (3.23)	6.36+ (3.43)	6.99* (3.36)	6.40+ (3.39)	7.83* (3.43)
Business services	5.27 (3.35)	4.46 (3.42)	5.77+ (3.29)	4.54 (3.33)	5.32 (3.32)
Financial services	2.64 (3.75)	2.15 (3.76)	2.67 (3.67)	1.67 (3.73)	3.33 (3.72)
Personal services	-2.67 (4.71)	-3.47 (4.75)	-2.14 (4.62)	-2.82 (4.66)	-1.37 (4.69)
Independent variables					
Product innovation_1999[a]		0.96 (0.81)			
Process innovation 2000 [a]			2.44** (0.78)		
External sourcing 1999 [a]				2.02* (0.85)	
Employee involvement 1999 [a]					-1.89* (0.78)
Constant	16.05*** (3.72)	16.38*** (3.73)	14.90*** (3.67)	16.36*** (3.68)	15.20*** (3.70)
*R (*Unadjusted/Adjusted R^2)	0.38 (0.14/0.10)	0.39 (0.15/0.11)	0.43 (0.18/0.14)	0.41 (0.17/0.12)	0.41 (0.17/0.12)
F – statistic *(df1, df2)*	3.65*** (10,218)	3.46*** (11,217)	4.34*** (11,217)	3.91*** (11,217)	3.92*** (11,217)
Delta R^2 after controls		0.01	0.04**	0.02*	0.02*

All values are non-standardized B coefficients (standard error in parentheses). . +: $p < 0.10$ *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; N=229

a: Standardized score used in the regression analysis

Table 5: Models of sales growth, continued

	All main effects	Main effects + Product innovation x size	Main effects + Process innovation x size	Main effects + External sourcing x size	Main effects + Employee involvement x size
	Model 6	Model 7	Model 8	Model 9	Model 10
Firm age	-3.01** (0.96)	-2.82** (0.96)	-3.00** (0.97)	-2.89** (0.97)	-3.01** (0.98)
Firm size[a]	-0.54 (0.87)	-0.71 (0.86)	-0.58 (0.87)	-0.52 (0.87)	-0.55 (0.88)
Family business	-0.67 (0.89)	-0.86 (0.88)	-0.78 (0.89)	-0.86 (0.89)	-0.68 (0.89)
Manufacturing	-2.30 (2.89)	-2.96 (2.85)	-2.19 (2.87)	-3.36 (2.90)	-2.31 (2.89)
Construction	0.28 (2.87)	-0.99 (2.86)	0.25 (2.86)	-0.93 (2.90)	0.25 (2.88)
Trade	3.60 (2.89)	2.38 (2.87)	3.37 (2.88)	3.15 (2.87)	3.60 (2.89)
Transportation	8.47* (3.32)	6.80* (2.32)	8.59** (3.30)	6.88* (3.37)	8.46* (3.33)
Business services	4.72 (3.29)	3.48 (3.26)	4.20 (3.28)	3.29 (3.32)	4.70 (3.30)
Financial services	2.63 (3.62)	1.75 (3.57)	2.70 (3.60)	1.09 (3.66)	2.57 (3.66)
Personal services	-0.89 (4.58)	-2.76 (4.55)	-0.81 (4.55)	-1.39 (4.54)	-0.93 (4.59)
Product innovation 1999 [a]	0.69 (0.80)	0.82 (0.79)	0.69 (0.79)	0.59 (0.79)	0.69 (0.80)
Process innovation 2000 [a]	2.43** (0.83)	2.41** (0.82)	1.89* (0.88)	2.25** (0.83)	2.45** (0.84)
External sourcing 1999 [a]	1.51+ (0.92)	1.38 (0.90)	1.60+ (0.91)	1.65+ (0.91)	1.52+ (0.92)
Employee involvement 1999 [a]	-2.83***(0.79)	-2.78*** (0.78)	-2.62*** (0.79)	-2.64*** (0.79)	-2.87*** (0.83)
Interaction terms					
Product Innovation 1999*Size [a]		-2.23** (0.79)			
Process innovation 2000*Size[a]			-1.40+ (0.79)		
External sourcing 1999 *Size[a]				-1.79* (0.82)	
Employee involvement 1999*Size[a]					-0.12 (0.81)
Constant	14.11***(3.61)	14.59***(0.56)	14.37*** (3.59)	14.59*** (3.56)	14.12*** (3.62)
R^2 (Unadjusted/Adjusted R^2)	0.48 (0.23/0.18)	0.51 (0.26/0.21)	0.50 (0.25/0.19)	0.50 (0.25/0.20)	0.48 (0.23/0.18)
F – statistic *(df1, df2)*	4.67*** (14,214)	5.04***(15,213)	4.63*** (15,213)	4.75*** (15,213)	4.34*** (15,213)
Delta R^2 of interaction term[b]		0.03**	0.01+	0.02*	0.00

All values are standardized beta coefficients. . +: $p < 0.10$ *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; N=229

a: Standardized score used in the regression analysis; b: Not shown: ΔR^2 of all main effects after controls is .09 (p<.001).

Table 6: Prediction of Product and Process Innovation: Lead-lag effects

	Product Innovation 1999	Product Innovation 2000	Product Innovation 2002	Process Innovation 1999	Process Innovation 2000	Process Innovation 2002
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Firm age	-0.01 (0.08)	-0.11 (0.08)	-0.03 (0.08)	-0.03 (0.08)	-0.12 (0.08)	-0.18* (0.08)
Firm size	-0.10 (0.07)	-0.04 (0.07)	-0.02 (0.07)	-0.00 (0.07)	0.04 (0.07)	0.19** (0.07)
Family business	-0.11 (0.08)	-0.11 (0.08)	-0.19* (0.07)	-0.02 (0.07)	-0.04 (0.07)	-0.08 (0.07)
Manufacturing	0.46 (0.24)	0.15 (0.24)	0.58* (0.24)	0.02 (0.23)	-0.20 (0.24)	0.29 (0.24)
Construction	0.19 (0.25)	-0.21 (0.24)	0.18 (0.24)	-0.03 (0.23)	-0.03 (0.24)	0.26 (0.24)
Trade	0.19 (0.24)	-0.25 (0.24)	-0.05 (0.24)	0.04 (0.24)	-0.54* (0.23)	-0.17 (0.24)
Transportation	0.19 (0.28)	-0.40 (0.28)	-0.05 (0.28)	0.21 (0.26)	-0.29 (0.27)	0.39 (0.27)
Business services	0.74** (0.27)	0.06 (0.27)	0.47^{+} (0.27)	-0.08 (0.26)	-0.37 (0.27)	-0.03 (0.27)
Financial services	2.63 (0.31)	-0.21 (0.31)	0.33 (0.30)	0.28 (0.29)	-0.26 (0.30)	0.33 (0.30)
Personal services	0.74^{+} (0.39)	0.56 (0.38)	0.59 (0.38)	-0.17 (0.36)	-0.36 (0.38)	0.25 (0.38)
External sourcing 1999	0.25*** (0.07)	0.28*** (0.07)	0.26*** (0.08)	0.08 (0.07)	0.38*** (0.07)	0.21** (0.07)
Employee involvement 1999	0.13^{+} (0.08)	0.07 (0.07)	0.02 (0.07)	0.48*** (0.07)	0.14* (0.06)	0.15* (0.06)
Product innovation 1999				-0.07 (0.06)	0.03 (0.07)	0.01 (0.07)
Product innovation 2000						0.01 (0.07)
Process innovation 1999	-0.08 (0.07)	0.02 (0.07)				
Process innovation 2000			0.02 (0.02)			
Constant	-0.28 (0.30)	0.40 (0.30)	-0.15 (0.30)	-0.12 (0.28)	0.60* (0.29)	0.39 (0.30)
R^2 (Unadjusted/Adjusted R^2)	0.40 (0.16/0.11)	0.41 (0.17/0.12)	0.45 (0.20/0.15)	0.53 (0.28/0.23)	0.47 (0.22/0.17)	0.47 (0.22/0.18)
F – statistic *(df1, df2)*	3.06** (13,215)	3.31*** (13,215)	4.19*** (13,215)	6.39*** (13,215)	4.59*** (13,215)	4.76*** (13,215)
Delta R^2 of capabilities	0.06***	0.08***	0.06***	0.23***	0.16***	0.08***
Delta R^2 of other innovation	0.00	0.00	0.00	0.00	0.00	0.00

All values are standardized beta coefficients. . $^{+}$: $p < 0.10$ *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; N=229

a: Not shown: Delta R^2 of all main effects after controls is .09 (p<.001)

Table 7: Tests for mediation: direct versus total effects of capabilities on average sales growth

	Sobel test results[a]				Bootstrap results[c]
	IV to mediator	Direct effect of mediator on DV	Total effect of IV on DV[b]	Direct effect of IV on DV	Indirect effect of IV on DV (lower/upper range)(SE)
External sourcing(IV) on average sales growth (DV) with as mediator:					
Process innovation 1999	0.07 (2.48) *	-1.74 (-0.62)	2.76 (2.38) *	2.88 (2.44) *	-0.12 (-0.68/0.22)
Product innovation 1999	0.35 (3.76) ***	0.54 (0.63)	2.76 (2.38) *	2.57 (2.14) *	0.19 (-0.38/0.98)
Process innovation 2000	0.20 (6.15)***	5.67 (2.40)*	2.76 (2.38)*	1.61 (1.29)	1.15 (0.33/2.31)**
Product innovation 2000	0.38 (4.29) ***	0.90 (1.02)	2.76 (2.38) *	2.41 (2.00) *	0.34 (-0.33/1.17)
Process innovation 2002	0.15 (3.85) ***	3.28 (1.61)	2.76 (2.38) *	2.26 (1.90)	0.49 (-0.02/1.28)
Product innovation 2002	0.35 (4.04) ***	0.92 (1.02)	2.76 (2.38) *	2.43 (2.02) *	0.35 (-0.35/1.29)
Employee involvement (IV) on average sales growth (DV) with as mediator:					
Process innovation 1999	0.49 (8.24) ***	3.46 (1.10)	-6.68 (-2.41) *	-8.38 (-2.64) **	1.70 (-2.23/5.59)
Product innovation 1999	0.47 (2,08) *	1.29 (1.56)	-6.68 (-2.41) *	-7.29 (-2.61) **	0.61 (-0.11/1.79)
Process innovation 2000	0.27 (3.29)**	8.41 (3.84) ***	-6.68 (-2.41) *	-8.99 (-3.26) **	1.64 (0.31/4.04)**
Product innovation 2000	0.45 (2.06) *	1.70 (2.01)*	-6.68 (-2.41)*	-7.46 (-2.68) **	0.77 (0.04/1.99)*
Process innovation 2002	0.30 (3.19) *	5.51 (2.77)*	-6.68 (-2.41)*	-8.32 (-2.97)**	1.63 (0.31/4.21)*
Product innovation 2002	0.26 (1.22)	1.58 (1.83)	-6.68 (-2.41) *	-7.10 (-2.57) *	0.42 (-0.08/1.40)

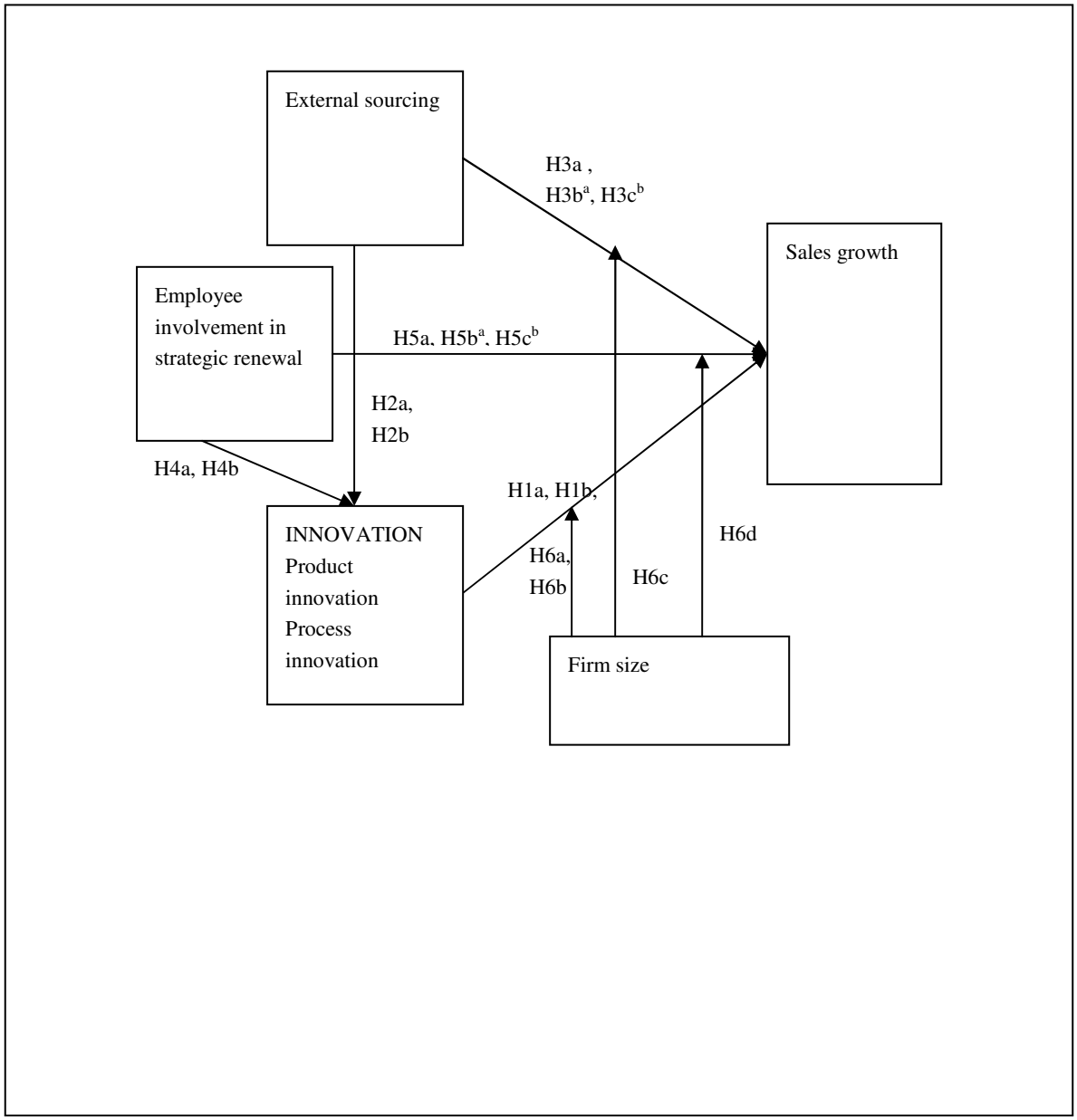
*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; N=229

a: For Sobel tests, first number of each pair is the coefficient, with t-value in parenthesis.

b: Total effect of independent variable is corrected for the effect of the covariates, (control variables used in the regression analysis, including firm size (ln), firm age (ln), family business and sector dummies).

c: Estimates based on average of 5000 bootstrap samples. Shown in parentheses are bias-corrected 95% confidence intervals. Normal distribution assumptions not required. Where the confidence interval does not contain zero, we can conclude that there is a significant mediation effect at the p<.05 level. (Where lower limit remains nonzero at 99% confidence interval, we indicate a significant mediation effect at the p<.01 level).

Figure 1: Framework for the Study



a: Product innovation as mediator variable; b: Process innovation as mediator variable.

Figure 2: Summary of results

Hypothesis	Predicted direction	Support	Table.Model
I. Innovation and sales growth			
1a. Product innovation→sales growth	+	No	T5.2
1b. Process innovation→sales growth	+	Strong	T5.3
II. Effects of external sourcing on innovation and sales growth			
2a. External sourcing→product innovation	+	Strong	T6.1,2,3
2b. External sourcing→process innovation	+	Strong	T6.4,5,6
3a. External sourcing→sales growth	+	Moderate	T5.4
3b. (H3a) is indirect, via product innovation	Indirect effect (+)	No	T7
3c. (H3a) is indirect, via process innovation	Indirect effect (+)	Strong	T7
III. Effects of employee involvement in renewal activities on innovation and sales growth			
4a. Employee involvement→product innovation	+	No	T6.1,2,3
4b. Employee involvement→process innovation	+	Moderate	T6.4,5,6
5a Employee involvement→sales growth	-	Moderate	T5.5
5b. Total effect of (H5a) is partly indirect via product innovation	Indirect effect (+)	Moderate	T7
5c.total effect of (H5a) is partly indirect, via process innovation	Indirect effect (+)	Moderate	T7
IV. Moderator effects of Size			
6a.Size moderates H1a	-	Strong	T5.7
6b. Size moderates H1b	-	Weak	T5.8
6c. Size moderates H3a.	-	Moderate	T5.9
6d. Size moderates H5a.	-	No	T5.10

Figure 3: Moderating effect of firm size on the relationship between product innovation and sales growth (Hypothesis 6a)

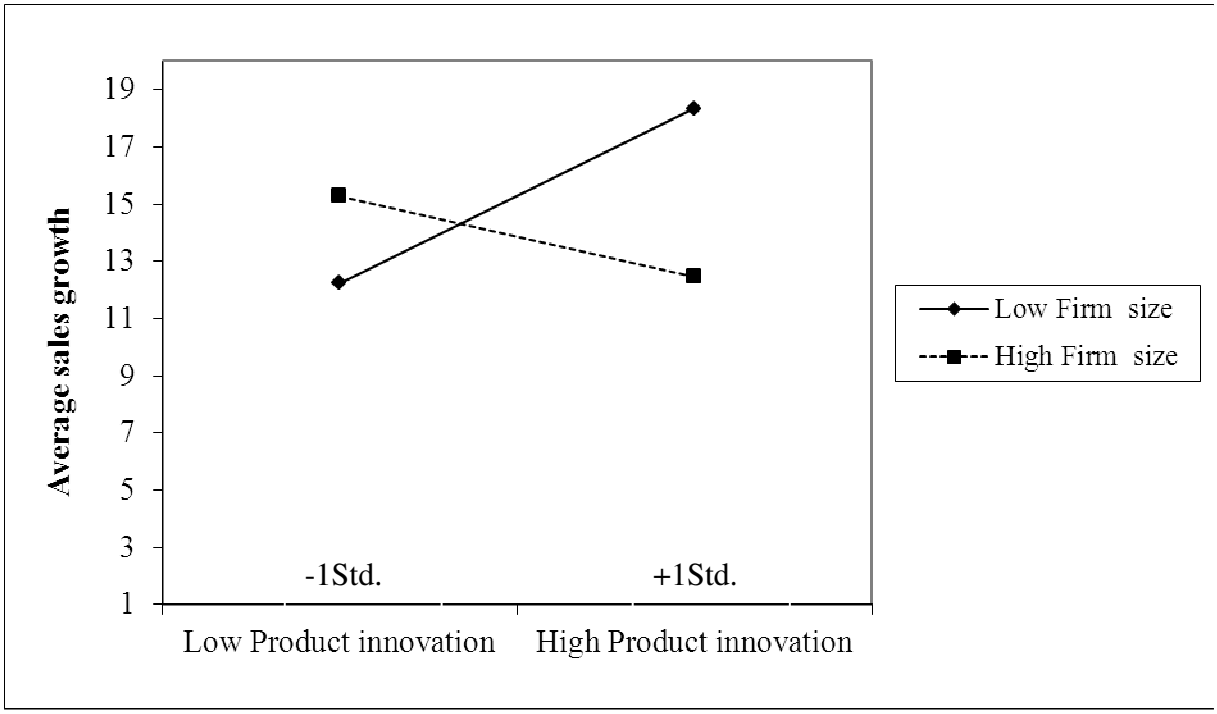


Figure 4: Moderating effect of firm size on the relationship between process innovation and sales growth (Hypothesis 6b)

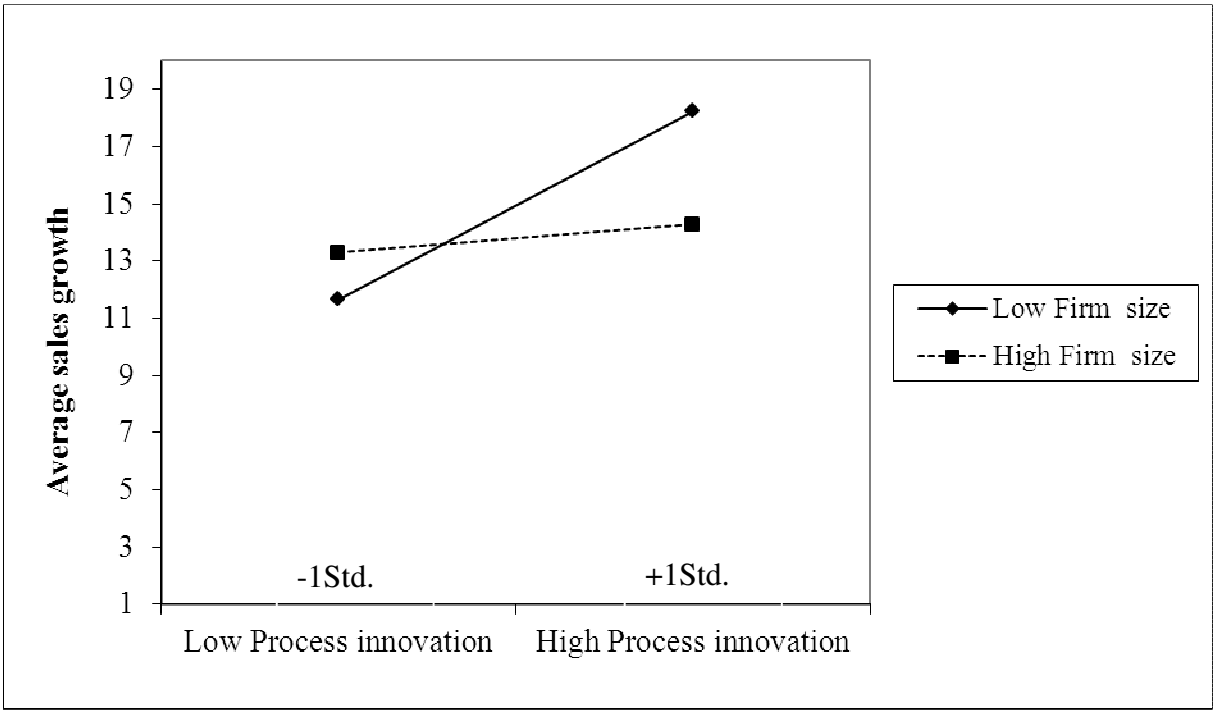
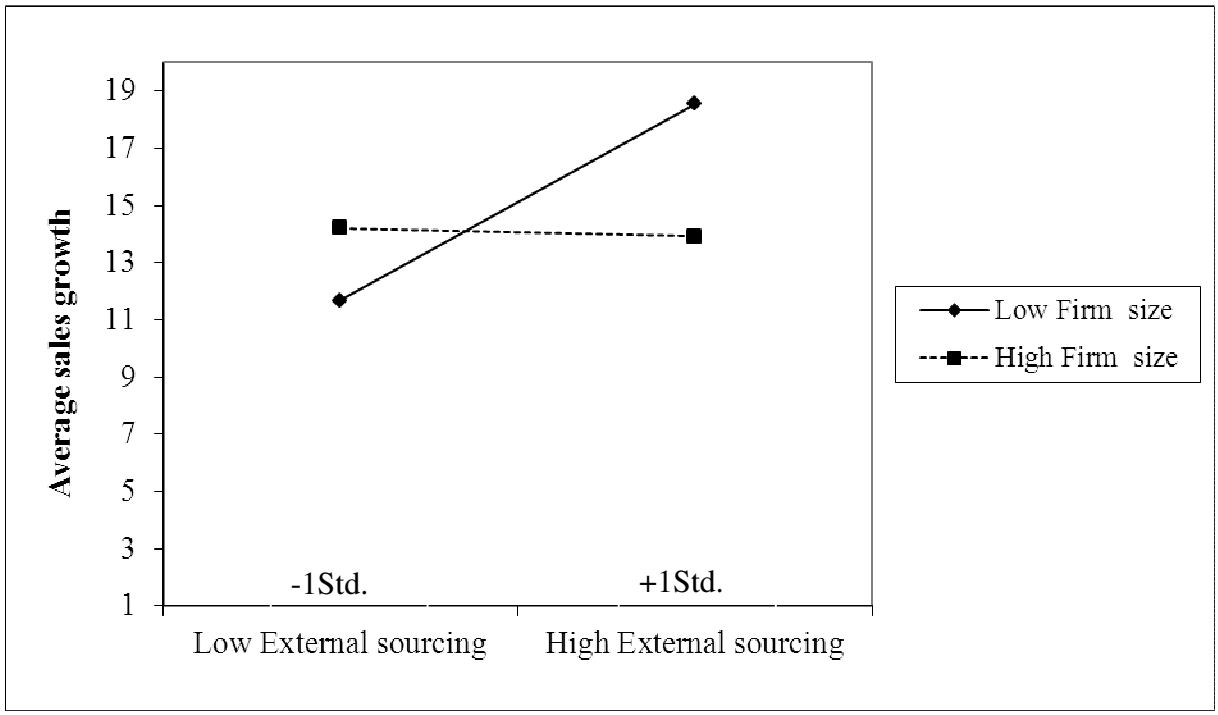


Figure 5: Moderating effect of firm size on the relationship between external sourcing and sales growth (Hypothesis 6c)



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