Horizontal and Vertical Relationships in Developing Economies: Implications for SMEs' Access to Global Markets

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ABSTRACT

We integrate resource-based-view, transaction-cost economics, and institutional theory to model how collaboration efforts among SMEs immersed in weak infrastructure and institutional environments help them achieve a host of collective efficiencies and greater access to global markets. Using a survey database from 232 Argentine wood-furniture SMEs, we find that while vertical ties yield manufacturing productivity along the supply chain, horizontal ties enable the access to collective resources and joint product innovation. These collective efficiencies, in turn, serve as competitive currencies for SMEs to access global markets. We discuss implications for theory and practice.

In most developing economies, firms are urged to become internationally competitive to boost exports and decrease country-risk exposure; at the same time, these firms tend to be deprived of superior technology and the supporting infrastructure often found in developed countries – e.g. government support, efficient ports, shared scale-efficient resources – to reach such global markets (Porter, 1998). Because small and medium enterprises (SMEs) are commonplace in these countries (Sengenberger, Loveman, & Piore, 1990), entrepreneurs are also plagued with severe scale constraints to invest in productive assets and develop international channels. A possible way to circumvent such scale and infrastructure limitations is to promote joint action among SMEs through interfirm agreements (Markusen, 1999; Storper, 1997; Tallman, Jenkins, Henry, & Pinch, 2004). By forging extensive collaborative ties, SMEs can exploit complementary competencies and solve common production problems (Amin & Thrift, 1992; Pouder & St.John, 1996), share knowledge, technologies, and inputs (Storper, 1997), develop greater responsiveness to global demands (Canina, Enz, & Harrison, 2005; Tallman et al., 2004; Tendler & Amorim, 1996), and attain greater export levels as a result (Schmitz, 1995: 537).

Ironically, while forging inter organizational collaborative arrangements appears to be critical for SMEs within weak infrastructure settings, it is precisely in those countries that firms also suffer from a host of institutional failures – e.g., poor legal systems, discretionary governmental policies, and inefficient regulation – that hinder the pursuit of such joint action and impose high investment uncertainties and exchange hazards (Mesquita, 2003; North, 1990). Suppose, for instance, that SMEs wish to articulate complementary competencies to overcome infrastructure shortcomings. As they invest in resources specific to their joint project and form expectations of outcomes which are difficult to meter *ex ante*, they may suffer severe contractual hazards. For example, some firms may renege on collective agreements and free ride on investments of others, as contracts are difficult to enforce.

These weak infrastructure and poor institutional setting dilemmas seem to be common across emerging markets (Hoskisson, Eden, Lau, & Wright, 2000), where the combination of small scale and lack of country-level support poses formidable challenges for SMEs. As such, we ask *how can SMEs' joint actions enable them to overcome weak infrastructure and institutional settings and become internationally competitive?* To address this question, we draw on three complementary theoretical lenses: the resource based view, transaction cost economics, and institutional theory. In a nutshell, we employ resource-based logic (Barney, 1991) to model how coordinated efforts to articulate distinct sets of interfirm resources and competencies allow SMEs to attain *collective efficiencies* – i.e. efficiencies that are unavailable to firms operating alone (Schmitz & Nadvi, 1999) – and overcome infrastructure limitations.[1] Such efficiencies in turn enhance SMEs' access to global markets. As these environments also present institutional challenges, we further employ transaction cost logic (Williamson, 1985) and institutional theory (North, 1990); these perspectives are particularly useful to demonstrate how SMEs can overcome institutional failures and avoid contractual hazards by forging relational governance mechanisms, i.e. sets of commitments, informal rules, and unwritten codes of conduct that affect the behavior of partners (Baker, Gibbons, & Murphy, 2002; Macneil, 1980). In sum, our model states that relational governance helps SMEs supplant weak institutions, and make possible their attaining *collective efficiencies* necessary to overcome infrastructure constraints in emerging markets; such efficiencies then enable firms to access global markets. We find empirical support for this model with tests on a sample of 232 wood-furniture SMEs located in the province of Buenos Aires, Argentina.

Our study brings at least three important literature contributions. First, we highlight, as earlier suggested by Hoskisson *et al* (2000), how the integration of distinct theories may help

[1] Our argument is also related to the so-called "relational view" (Dyer & Singh, 1998), which establishes the value of resources in the context of inter organizational relationships. Specifically, we examine how firms develop collective efficiencies by employing resources that "extend beyond firm boundaries" (Dyer & Singh, 1998: 660).

bring to light important aspects overlooked by individual frames. As we explore events falling in the interstices of the theories mentioned above, we are able to enrich our understanding of more complex phenomena. Second, unlike studies focusing on a particular type of inter organizational tie – e.g. vertical relationships (Dyer, 1997; Helper, 1991) or horizontal ones (Doz & Hamel, 1998; Gulati, 1999; Kogut, 1988) – we analyze how SMEs can attain export-enhancing collective efficiencies through the management of a complex web of *both* vertical and horizontal relationships. As such, our work helps expand a growing line of inquiry demonstrating the virtues of a more integrated picture (e.g. Brandenburger & Nalebuff, 1997; Choi, Wu, Ellram, & Koka, 2002; Lazzarini, Chaddad, & Cook, 2001; Storper, 1997) as we explicit the impact of collaborative processes on the creation of export-enhancing collective efficiencies. Finally, our model also helps highlight important contributions to the international management and cluster-development literatures, not only as it fine tunes theoretical aspects but also through the application of novel empirical methods not used in strategy studies before.

Our paper is structured as follows. In the next section, we present our theoretical model, define the relevant constructs, and identify the links among them. We then describe our data and empirical approach to test those hypotheses. Results are presented and discussed next. Concluding remarks, including implications for theory and practice, follow.

INTER ORGANIZATIONAL RELATIONSHIPS, COLLECTIVE EFFICIENCIES, AND SMEs' ACCESS TO GLOBAL MARKETS

Promoting Collective Efficiencies Through Interfirm Coordination

The resource-based view of the firm (RBV) states that the possession of distinctive resources is critical if one wishes to attain competitive advantage (Barney, 1991; Miller & Shamsie, 1996; Peteraf, 1993). Smaller scale firms may be particularly pressed to reach beyond their own boundaries to find and control such key resources (Dyer & Singh, 1998). For instance, SMEs may work together to integrate complementary assets, or even jointly

promote investments in common resources (e.g. logistic infrastructure) which would otherwise be prohibitively costly. Essentially, this possibility of joint efforts results from various forms of interfirm interdependencies that make the performance of a firm dependent on the performance of other firms in the same industry or market domain. To more didactically develop our theoretical model, we rely on Thomson's (1967) categorization of interdependencies which, though not central to our model, helps illustrate the multiple ways in which interfirm coordination can lead to distinct types of collective efficiencies (Gulati & Singh, 1998; Lazzarini et al., 2001).

First, the activities of firms may be related to each other in a *pooled* way. In this case, although firms are loosely coupled, they may wish nonetheless to be interdependent so as to benefit from resources which any firm alone would be unable to acquire due to scale constraints. Here, firms pool their common needs to *collectively source* the provision of a broad set of scale-efficient resources, such as export infra-structure (e.g., roads and ports), aggregate market information, and other types of governmental support (e.g., the promotion of products in foreign markets). Second, firms' activities may be related to each other in a *sequential* fashion, where one's input is another's output. This type of interdependence typically occurs among firms in a supply chain, where the performance of a particular activity (e.g., assembly) will be heavily dependent on the performance of upstream stages of production (e.g., the supply of components). Thus, firms may attain *manufacturing productivity* (e.g. inventory and delivery efficiencies) if they coordinate their sequential activities and jointly develop competencies to manage their supply chain. Finally, activities may be related to each other in a *reciprocal* way, whereby each agent's input is dependent on the others' output and vice versa. For instance, SMEs interested in jointly developing new products can mutually deploy resources and co-specialize their knowledge through simultaneous, recurring interactions (Gulati & Singh, 1998). By combining distinct and

complementary resources, SMEs can, for example, collectively achieve rates of *product innovation* that would be unattainable individually. We therefore focus our analysis on three major types of collective efficiencies that SMEs can achieve through the coordination of their efforts: sourcing of collective resources, manufacturing productivity, and product innovation.

Relational Governance as a Mechanism of Interfirm Coordination

As parties integrate the above resource interdependencies to attain collective efficiencies, they must align expectations and mitigate associated trade hazards. Given the relationship-specific nature of these efforts, transaction cost logic suggests that parties will need to employ safeguarding mechanisms, such as formal contracts, to avoid opportunistic expropriation (Williamson, 1985). Contracts, however, require the existence of solid institutions to guarantee their good functioning. For example, scholars point out that the existence of strong courts offers a context that help curb opportunism; parties behave as contracted within these institutional settings, aware of the dire consequences arising otherwise (North, 1990; Stone, Levy, & Paredes, 1996). In most emerging economies, however, firms are plagued with weak institutions, making the enforcement of such safeguards ineffectively and costly. In these settings, firms are likely to resort to informal, *relational* mechanisms of governance to support their joint action and supplant the absence of adequate legal enforcement (e.g. Ellickson, 1991; Greif, 1994; Xin & Pearce, 1996).

Relational governance mechanisms are interfirm cooperative arrangements based on informal rules and unwritten codes of conduct that affect the behavior of firms when dealing with others (Baker et al., 2002: 39). Partners engaged in relational governance rely on generic processes for periodic *ex post* negotiations (Macneil, 1980), and thus overcome difficulties involved in formally spelling out actions and responsibilities *ex ante*. As such, parties institutionalize the very environment surrounding their trade with elements that conform a "mini-society" (Williamson, 1985: 71) within which they solve conflicts based on mutual

assessment of circumstances as they unveil (e.g. Baker et al., 2002; Heide & Miner, 1992). Fundamentally, relational governance mechanisms are based on recurring exchanges between firms. Theories of contractual self-enforcement posit that parties may honor unwritten agreements in order to preserve their reputation and avoid the termination of valuable, long term relationships (Axelrod, 1984: 124; Heide & Miner, 1992: 267). As parties continue transacting over time, social norms and trust will also tend to emerge and further support a collaborative orientation (Fichman & Levinthal, 1991).

Relational governance involves a complex, multidimensional set of norms (Macneil, 1980). We follow Palay (1984) and Kaufmann & Stern (1988) by focusing on particular relational norms supporting informal agreements. First, parties engaged in relational governance should share information so as to facilitate their current interaction and promote subsequent changes in product design and schedules (Palay, 1984). Second, firms should maintain a high level of mutual assistance (Macneil, 1980), for instance by helping each other during unanticipated crises, or recommending alternative courses of action when new contingencies emerge. Finally, firms should pay attention to distributive norms (Kaufmann & Stern, 1988; Ring & Van de Ven, 1992) by sharing the costs and benefits of their joint efforts; here, unilateral bargaining is supplanted by a mutual orientation to promote fair returns for the parties involved in a given project or activity.

Horizontal and Vertical Relationships and the Distinct Types of Collective Efficiencies

Based on the above, we next explain the link between relational governance and distinct types of collective efficiencies. Then, we address how these resulting collective efficiencies associate with improved access to global markets (Figure 1).

<< Insert Figure 1 about here >>

Our discussion on the effects of relational governance distinguishes between two types of ties that may occur among SMEs: *horizontal* (involving SMEs located in the same industry

segment or producing complementary products) and *vertical* (involving SMEs specialized in sequential activities of a particular supply chain). Consider first how SMEs may secure the provision of collective resources. As Schmitz (1995) explain, collective sourcing is especially relevant when firms need resources that require large-scale initiatives, such as when firms pool their efforts to more effectively lobby their government for improved financing or jointly collect information on new opportunities in global markets (Bartlett & Ghoshal, 1992). To do so, SMEs must establish common rules and patterns of interaction that guide their joint action while preserving their autonomy (Thompson, 1967). For example, if SMEs would like to improve their access to global markets, they may decide to establish a common brand, and even integrate individual efforts to collectively lobby their government for financial support or investments in infrastructure. A critical decision will be how to assign responsibilities and share the costs to perform particular collective actions, given that the benefits will be equally available to all SMEs in the same industry or market domain. Free-riding will be a possibility: some firms may bear a proportionally higher fraction of the necessary time and effort to secure collective resources while others may try to free-ride on those efforts (Nault & Tyagi, 2001; Olson, 1965).

Relational governance helps SMEs overcome such coordination dilemmas by enhancing their ability to align expectations and craft common strategies to secure collective resources. For example, implicit commitments to share information and mutually assist one another enable parties to resolve pending conflicts in their process of adaptation to new standards and other types of collective strategies (Heide & Miner, 1992; Helper, 1991). Moreover, relational governance discourages free-riding and promotes mutual trust due to evolving social norms and procedures guiding collective action (Ostrom, Walker, & Gardner, 1992). Thus, we expect that a group of firms is likely to be more willing to invest time and effort to

obtain government support for their joint export initiatives when they are confident that all the other parties are fully committed to the process.

We posit that the relational governance of *horizontal* ties will be particularly important to guarantee the provision of collective resources because it will be easier to establish a common agenda when SMEs are in the same industry or market segment. Horizontally-linked SMEs face similar challenges in their competitive arenas, and hence will more likely agree on common strategies and more equally benefit from industry-specific norms. In contrast, vertically-linked SMEs will likely have more differentiated demands with respect to collective resources. For instance, while manufacturers of final goods may be more interested in governmental support to collect information on international clients, suppliers of components may be more interested in domestic financing or local investments in logistics. Even though vertically-linked firms should also have a set of overlapping interests, we contend that the likelihood of effective joint action for the provision of collective resources will be higher in the case of horizontally-linked, relationally-governed SMEs. Thus, in weak infrastructure and institutional environments:

H1: *An SME's relational governance of horizontal ties associates positively with its sourcing of collective resources*

Relationships should also contribute to the attainment of superior manufacturing productivity along the supply chain. SMEs can coordinate their sequential activities to guarantee, for example, higher inventory turnover and timely delivery (Boyer, Leong, Ward, & Krajewski, 1997). Such coordination also involves severe challenges, as parties need to jointly plan their production schedules and constantly check for inconsistencies and nonconformities (Thompson, 1967). Because of the sequential nature of the process, interfirm coordination to achieve manufacturing productivity largely benefits from *vertical* relationships among suppliers and their clients.

The critical role of relational governance on the coordination of vertical ties can be explained by two distinct, yet related arguments. The first of these, based on transaction cost economics, explains that relational governance contributes to an attenuation of contractual hazards occurring in complex buyer-supplier arrangements involving the deployment of relationship-specific resources (Poppo & Zenger, 2002; Williamson, 1985). Because vertical exchanges are commonly subject to moral hazard (e.g., the seller delivers core inputs of lower quality, in an untimely manner, or the buyer bargains for price reductions after the seller consummates specific investments), parties can benefit from social norms and commitments that accompany such relationships as these can help mitigate those hazards, reduce transaction costs, and increase exchange efficiencies as a result (Dyer, 1997). As Helper (1991) explains, the relational commitments to "voice" concerns help firms resolve their conflicts and avoid *ex post* negotiation hazards.

The second argument explains that relational governance mechanisms affect the efficiency with which parties mutually coordinate their interdependent assembly systems and build up competencies to manage their activities (Gulati & Singh, 1998). The development of vertical relationships, in particular, can help SMEs develop competencies to coordinate their production activities in a flexible way. For instance, commitments for information exchange, especially on market demand conditions, enable parties to more accurately track the expectations of one another and adjust production processes accordingly (Van de Ven & Walker, 1984). Likewise, commitments for mutual assistance, especially during emergency production line breakdowns, can help parties either prevent unwanted supply interruptions or even react quicker to avert major losses when disruptions inadvertently occur; thus, such commitments help firms enhance the reliability of processes in the supply system (Boyer et al., 1997) . Therefore, in weak infrastructure and institutional environments:

H2: *An SME's relational governance of vertical ties associates positively with its manufacturing productivity.*

Relational governance also allows SMEs to leverage their rates of product innovation. We propose, in particular, that *both* vertical and horizontal relationships will help SMEs achieve this type of collective efficiency. Thus, buyer and supplier may jointly develop a new product or adjust the attributes of existing products (the architecture of components, the functionality of the overall design, and so on). To do so, they will likely have to co-specialize their resources and competencies: the seller will have to develop knowledge and production processes that are specific to the manufacturer, and the manufacturer will have to develop operations and marketing efforts that rely on the specific attributes of the product (Teece, 1992: 9). Co-specialization will be greater if parties are willing to fully exchange proprietary information, mutually assist one another, and guarantee that there will be a fair division of the net value arising from such investments in innovation. Relational norms will therefore promote greater support for co-specialization efforts (Dyer & Singh, 1998; Poppo & Zenger, 2002), which leads us to propose that vertical relational mechanisms are likely to induce higher rates of product innovation.

The same is true in the case of horizontal ties. Firms that are part of the same industry or segment may want to share complementary knowledge to improve their existing product portfolio, create new products, or jointly develop product bundles (Audretsch & Feldman, 1996). Because horizontally-linked firms tend to operate in the same industry or segment, knowledge sharing may lead to imitation or expropriation of proprietary technology (Dussauge, Garrette, & Mitchell, 2000; Zhao, Anand, & Mitchell, 2004). For instance, a firm may learn the design processes of one of its peers, and then apply this knowledge in the development of competing products. This behavior may not occur, however, if peers form horizontal links whereby norms and social attachments become prevalent (Granovetter, 1985; Uzzi, 1997). Therefore, in weak infrastructure and institutional environments:

H3: *An SME's relational governance of (H3a) horizontal and (H3b) vertical ties associate positively with its product innovation.*

Collective Efficiencies and the Improved Access to Global Markets

In the second part of our model, we posit that the benefits resulting from collective efficiencies enable SMEs to improve their access to global markets. Our argument derives from propositions established in the earlier international management literature (Buckley & Casson, 1976; Dunning, 1981). Dunning (1981), for example, posits that firms will have a better chance to access global markets if they have the necessary resources and capabilities to scan international clients and meet their expectations in terms of quality, timely delivery, etc. (see also Bartlett & Ghoshal, 1992: 10). Specifically, as more and more industries have exhibited increasing scale economies, and faster rates of product innovation induced by skyrocketing R&D investments, firms are increasingly required to muster superior knowledge and capabilities to seek, find, and flexibly serve the needs of global customers. Firms can position themselves as high-scale, low-cost providers, and even, in some cases, attempt to out innovate competitors (Buckley & Casson, 1976; Caves, 1982).

Because SMEs often lack individual resources and capabilities to address such scale-based and innovation challenges in global markets, we theorize that collective efficiencies resulting from the proper coordination of joint action among SMEs allows these firms to overcome such difficulties and strengthen their ability to compete globally. Thus, manufacturing productivity emanating from the relational coordination of sequential activities is likely to bring cost-based competitive advantages for SMEs in global markets. Moreover, increased product innovation resulting from the relational coordination of knowledge-based resources is likely to improve SMEs' ability to satisfy the needs of diverse international customers. Finally, improved sourcing of collective resources is likely to enable SMEs to leverage their presence in global markets if, for instance, they influence local governments to invest in export infrastructure or collectively gather information about

potential foreign clients. Such collective sourcing provides firms with capabilities to seek, find, and supply international clients – capabilities that each SME, alone, would be unable to gather. In sum, consistent with the resource-based view of the firm, we posit that these collective efficiencies borne by the articulation and creation of distinctive interfirm resources and competencies will allow firms to develop competitive advantage and better access global markets. Thus, within weak infrastructure and institutional environments:

> H4: *An SME's improved (H4a) sourcing of collective resources, (H4b) manufacturing productivity, and (H4c) product innovation associate positively with its access to global markets.*

DATA AND METHODS

Industry Setting

We tested the proposed model with a survey data set from SMEs producing wood furniture in the province of Buenos Aires, Argentina. These firms make finished goods such as tables, chairs, cabinets and other pieces which are sold as single units or as sets, and also pre-assembled whole parts, such as machined table structures, bed frames and other complex compositions of separate parts. To ensure consistency, we excluded makers of smaller parts, such as laminated wood, tubes, connections, wheels and nuts-and-bolts.

We believe that the country in question and the industrial setting are appropriate given our objectives. First, Argentina is known to suffer from a lack of strong export-enhancing infrastructure as well as solid institutions as those found in more developed countries. Such conditions create barriers for local companies that need to expand globally or even simply coordinate joint actions (Mesquita, 2003). Moreover, recent studies demonstrate that exports have become an important means to gauge success of firms in Argentina, as it represents a source of hard currency for firms competing in a shrinking local market as well as a form of diversification against country level risk (Carrera, Mesquita, Perkins, & Vassolo, 2003). Thus our study setting provides an invaluable opportunity to model how SMEs can overcome

common environmental difficulties by coordinating their joint action so as to attain collective efficiencies and successfully access global markets.

The Argentine wood furniture sector is also adequate for testing our model given the profile of its firms. Most firms are small family businesses (CSIL Research, 2003); as such they lack the necessary scale to compete on costs and search for global opportunities. Further, responding to a request of the wood-furniture business association, the Foreign Ministry of Argentina developed an exports sponsorship program coordinated by its agency *Fundación ExportAR*. Such program provided wood-furniture makers with the necessary support in foreign relations, market information and even partial financial support aimed at facilitating their involvement in export activities. We consider this governmental service to be a collective resource that a group of firms can access through interfirm coordination.

Data Collection

In collecting our data set, we mostly followed prescriptions by Dillman (2000). We initially developed a questionnaire by identifying construct items from previous studies. We then interviewed entrepreneurs and managers to develop and adapt items, to refine survey wording and check the overall validity of questions vis-à-vis their industry environment. With the help of 3 local business organizations, we assembled a list of 521 firms. Based on information from the Argentine Ministry of Economy, we believe the population of wood-furniture-makers is as large as 2000 firms. Thus, we believe that our initial sample is fairly representative of the population. Based on this initial sample, our response rate was roughly 45% (232 responses). We also assessed whether non-respondents could have produced any significant biases, by comparing early to late respondents through *t* tests (see Armstrong & Overton, 1977 for similar treatment). We found no significant differences.

In the survey, respondents assessed their vertical and horizontal ties and performance. They were asked to consider the past 3 years of their relationships to avoid capturing biased

responses due to peak performance at given occasions or even one-time negative relationship experiences. Likert-scale measures ranged from 1 (not at all) to 5 (to a high extent).

Measures

Relational governance of vertical and horizontal ties. We asked entrepreneurs[2] to indicate on a 5-point Likert scale the degree to which they were committed to establishing a set of behavioral norms in the partnerships they held. Vertical and horizontal partnerships were referred to in separate questions. As such, we measure the degree to which respondents rely on social commitments of collaboration as gauged by their efforts to (a) share information, (b) assist each other and (c) promote fair sharing of cost savings and benefits arising out of joint efforts. The two first survey items were adapted from Heide & John (1992) and Artz & Brush (2000). The third was adapted from Ring and Van de Ven (1992).

Sourcing of collective resources. To measure the degree to which firms share resources, we were careful to select a form of resource sharing that was meaningful to the particular population studied. As mentioned above, a particular type of collective resource provided to this group of firms involved the efforts by *fundación ExportAR* in assigning a foreign ministry counselor to assist wood-furniture makers in matters related to (a) contacting potential foreign customers through their web of consulates in other countries, (b) coordinating and financing their showing products in international fairs, and (c) promoting their collective "country image" (i.e. "made in Argentina"). As such, we inquired firms as to the degree to which the respondent's firm pooled demand with other peer firms for specialized services such as these.

Manufacturing productivity. To gauge productivity we refer to past research using metrics associated with performance of production systems (Boyer et al., 1997; De Meyer & Ferdows, 1985; Ward, Duray, Leong, & Sum, 1995). These scholars suggest the use of

[2] To the extent the owner-CEO is invariably the person who has the authority for all major decisions taken by the small organization, we take interfirm relationship effects of the 'owner-manager to be tantamount to those of the organization'. See McEvily & Zaheer (1999) - footnote, pp1137 for similar treatment.

inventory turns and timely deliveries. The first directly gauges productivity, i.e. the amount of input tied to production output, whereas the second gauges efficiencies in the handling of production processes as goods move from up to downstream stations in the value chain. Thus, we asked respondents to indicate the (a) number of inventory turns necessary to support 12 month sales as well as (b) the percentage of goods delivered as timely as promised. An analysis of those measures indicated that timely delivery was highly skewed; because our analysis requires normally distributed data, we dropped this measure from our study.

Product innovation. Product innovation has become one of the most important aspects of competition in the world market for wood furniture (CSIL Research, 2004). A measure of product innovation that is often used in the industry (CSIL Research, 2004) is the rate of "catalogue turn over" defined in our survey as both (a) the percentage of revenue arising out from new products, and (b) the percentage of new products in a firm's catalogue.

Access to global markets. To gauge the degree to which SMEs have successfully accessed global markets, entrepreneurs suggested that we should use some indicator related to the percentage of revenues coming from foreign clients. Thus, we measure SMEs' access to global markets as the percentage from a firm's total sales that go to foreign markets.

Control variables. Although we are interested in developing a parsimonious model, other alternative factors may also influence the relationships stated in Figure 1. Therefore, we include control variables to ensure results are not unjustifiably influenced by these factors. First, we control for firm size. Because larger firms may possess a larger pool of resources, such as capital and managerial talent to go international alone, it may be the case that their international success results from higher scale instead of collective efficiencies developed through interfirm relationships. Firm size is a composite measure of log of (a) 3-year average yearly revenues and (b) number of employees. Second, we control for "competitive pressure" in the marketplace. If a firm suffers from stiff competition in its domestic market segment, it

is more motivated to pursue foreign markets. Competitive pressure is measured as the log of number of competitors, that is, firms selling similar products in the same domestic market.

We also adopt a set of variables to control for spurious causality involving relationships, collective efficiencies, and export performance. For instance, a firm with greater strategic orientation to export would be both more likely to access global markets and also more interested to participate in collective sourcing of specialized government support for going abroad. Therefore, we add the control variable "export orientation", measured in Likert-scale form as the degree to which respondents believe that firms that export their goods (a) are more competitive than those which do not, and (b) can better weather home market recessions. If a significant effect is found on both constructs, it could mean that the association between collective sourcing and access to global markets is spurious. Finally, we control for "investments" in (a) just in time (JIT), (b) total quality management (TQM), and (c) new information technology equipment and processes (IT). Our worry here is the possible spurious causality of the effects of horizontal and vertical relational governance on collective efficiencies, particularly manufacturing productivity and innovation. Firms that are in the process of implementing JIT and TQM related practices may *search* for closer partnerships because these are seen as part of the overall scheme of implementing leaner forms of manufacturing (Boyer et al., 1997). Failing to control for "investments" may therefore yield spurious associations. In this case, if 'investments' associate with both relational governance and collective efficiencies, our theorized effects of relational governance on collective efficiencies could be either spurious or even causally reversed.

Structural Equation Method

We performed a structural equation analysis, which, by definition, is a hybrid of factor and path analysis. To implement the model, we followed recommendations by Anderson & Gerbing (1988). Specifically, in the first stage we used confirmatory factor analysis to test

whether the variables selected to measure each construct show convergent validity (i.e., whether items are fairly correlated with one another) and discriminant validity (i.e., whether variables across constructs clearly measure different constructs). In the second stage, we compute the structural model, based on the measurement model found in the first stage. Here, inter factor correlations are estimated for all factors, making this an oblique, rather than an orthogonal analysis. Anderson & Gerbing (1988) recommend that, when moving to the second stage, one should compare two other models to the theoretical model: the next-best constrained and the next-best unconstrained models. The former is based on the theoretical model but is subtracted one or another previously specified path representing important alternative theoretical arguments. The latter contains all paths included in the theoretical model plus one or more previously unspecified paths representing important alternative theoretical arguments. Thus, for the next-best unconstrained model, we added non-hypothesized paths between horizontal governance and manufacturing productivity, as well as vertical governance and collective sourcing to assess whether our parsimonious model is appropriate. For the next-best constrained model, we dropped the path between horizontal relational governance and innovation. Previous studies argue that firms are more likely to cooperate with suppliers, whom they see as partners, as opposed to collaborating with peer firms, whom they see as competitors (Choi *et al*, 2002; Nalebuff & Brandenburger, 1997).

Because our analysis of alternative models involves interactions, a note on how we model interaction terms is in order. Analyses of latent variable interactions are not common in strategy studies and only recently have they been adopted in marketing and psychology (see Bollen & Curran, 2005 for a review). Here, we use Ping's (1995; 1996) techniques for interaction terms with a single indicant. The single indicant for two factors X and Y, with respective indicants as x_1, x_2 and y_1, y_2, is computed as $X:Y = (x_1 + x_2)(y_1 + y_2)$. In such case, Ping proposes that the loadings and errors for X:Y be given respectively by $\lambda x:y = (\lambda_{x1} +$

$\lambda_{x2})(\lambda_{y1} + \lambda_{y2})$ and $\theta_{\varepsilon x:y} = (\lambda_{x1} + \lambda_{x2})^2$ Var(X)$(\theta_{\varepsilon y1} + \theta_{\varepsilon y2}) + (\lambda_{z1} + \lambda_{z2})^2$ Var(Y)$(\theta_{\varepsilon x1} + \theta_{\varepsilon x2}) + (\theta_{\varepsilon x1} + \theta_{\varepsilon x2})(\theta_{\varepsilon y1} + \theta_{\varepsilon y2})$. As far as specification of the measurement model is concerned, based on Anderson & Gerbing (1988: 418), Ping (1995: 339) indicates that the unidimensionality of X and Y enables the omission of the nonlinear latent variables from the linear-terms-only measurement model. Because X and Y are each unidimensional, their indicants are unaffected by the presence or absence of other latent variables in a measurement or structural model. Stated differently, this provides similar measurement parameter estimates between measurement and structural models.

RESULTS AND DISCUSSION

Measurement Model

Table 1 reports basic statistics and correlations. Tables 2 through 5 report results of our SEM analysis, based on the two stage procedure recommended by Anderson & Gerbing (1988). A brief analysis of the correlation matrix shows initial evidence of good convergent and discriminant validity: all 14 values greater than 0.58 involve intra factor correlations, while inter factor correlations do not surpass the 0.36 level. We also followed Anderson & Gerbing's (1988) formal analysis for convergent validity by computing *t*-tests for factor loadings. We kept indicators for which factor loadings were greater than twice their standard errors (Table 2). Lastly, we assessed discriminant validity. Here, we used chi-square difference tests for constrained and unconstrained models. The constrained model sets the covariance between two constructs equal to one; a significantly lower chi-square value for the unconstrained model supports the discriminant validity criterion. As Table 3 indicates, all multi-item constructs exhibit satisfactory discriminant validity.

Table 4 present summary statistics for all models estimated in both stages as well as difference statistics for all tests of one model against another. As far as our test of the initial measurement model (model 1) is concerned, we look at chi-square and five other goodness-

of-fit statistics: the goodness of fit index (GFI), the normed and the non-normed fit indices (NFI and NNFI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). A commonly accepted rule of thumb is that the first 4 fit indices should be greater than 0.90 (Anderson & Gerbing, 1988)[3]. RMSEAs of 0.05 or less indicate good models. Probability levels on chi-square of 0.10 or higher are generally considered evidence of ideal models (Bentler, 1989). Because the chi-square statistic of model 1 is insignificant ($p < 0.364$), and because all goodness-of-fit indices are within the expected range, we conclude that this is a strong measurement model.

Structural Model

We therefore proceeded to stage 2, which involves path analyses with the latent and observed variables resulting from the measurement model obtained in the first stage. Our theoretical model (model 2), represented in Table 4, has a significant chi-square, which could be cause for concern. In such cases, Anderson & Gerbing (1988) argue that the chi-square test is frequently not valid in applied settings, and recommend that this statistic be treated as a general goodness of fit index, but not as a statistical test in the strict sense. Many researchers use the informal criterion that the model may be acceptable if the chi-square value is less than twice the size of the degrees of freedom (Bentler, 1989). The fact that our model 2 chi-square of 231.5 is less than twice the degrees of freedom of 167 together with the fact that all other goodness of fit indices are within expected ranges (i.e. above 0.9, while RMSEA is below 0.05) indicates ours is a strong and acceptable theoretical model.

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[3] GFI indicates the relative amount of variance and covariance jointly explained by the model. The NNFI (Bentler & Bonnett, 1980) is defined as "the percentage of observed-measure covariation explained by a given measurement or structural model … that solely accounts for the observed measure variances" (Anderson & Gerbing, 1988: 421). NNFI is often viewed as a superior variation of the Bentler & Bonnett's (1980) normed fit index (NFI) since it has been shown to be more robust in reflecting model fit regardless of sample size (Anderson & Gerbing, 1988; Bentler, 1989). Bentler's (1989) CFI, is similar to the NNFI in that it provides an accurate assessment of fit regardless of sample size. The CFI tends to be more precise than the NNIF however in describing comparative model fit as it corrects for small sample size by subtracting the degrees of freedom from their corresponding χ^2 values (Bentler, 1989). RMSEA (root-mean-square error of approximation) incorporates both model complexity (expressed in the degrees of freedom) and sample size in the analysis, and is thus suggested for analyses relying on Maximum Likelihood (Browne & Cudeck, 1993) with smaller sample sizes.

From here, the second step in the path analysis is to compare the next-best constrained model (model 3) with our theoretical model (model 2). Model 3 gains one degree of freedom (table 4), but that comes at a cost of a significant increase in chi- square ($\Delta\chi^2 = 14.79$; $p < 0.001$). Thus, we still prefer our original model 2. We next test model 2 against the next-best unconstrained model (model 4). Here we lose degrees of freedom ($\Delta df = -2$), while there is no significant improvement in chi-square ($\Delta\chi^2 = 0.16$; $p > 0.1$). We therefore discard the next-best unconstrained model, and following Anderson & Gerbing, retain model 2. As a follow up step, we examined modification indices resulting from Lagrangian multiplier tests (Bentler, 1989) to see if any unspecified paths could be added to improve model fit. Here, we find it necessary to add a covariance path between the error terms of *horizontal* and *vertical relational governance*. Additionally, we find that several elements in our model are correlated, and that adding covariance paths among them would help ensure our findings are robust. We thus also add covariance paths between the error terms of the three *collective efficiencies*, as well as between 3 exogenous factors (i.e. *investments*, *firm size*, *and export orientation*) and the error terms of *competitive pressure, horizontal* and *vertical relational governance*. Lastly, we trim off insignificant parameters estimates to obtain a most constrained version of the theoretical model; based on the marginal significance cutoff of $p<0.10$, and z-statistic of 1.645, we dropped the path between vertical relational governance and product innovation. We however retain paths involving control variables and covariances between the items mentioned above, even if their coefficients were insignificant.

As a result of the above mentioned changes, we specified our "best model" (model 5), shown in figure 2. The chi-square statistic for model 5 is not significant ($\chi^2 = 162.4$; $p \sim 0.5$), and represents a significant reduction from the chi-square of model 2 ($\Delta\chi^2 = -69.11$; $p < 0.001$). Though a statistically non-insignificant chi-square often indicates a good fit to the model, we are only cautiously optimistic. Critics often argue that statistically non-significant

chi-squares can also represent unstable chi-square statistics when one uses small samples (e.g. less than 300 observations, as is our case). In these circumstances, adding covariance paths to control for correlation (as we did from model 2 to model 5) can result in a model that is *over fitted* (e.g. Byrne, 2001: 92; Wheaton, 1987: 123). To ensure this is not the case, we also contrast other fit indices, as shown in table 4. There, not only do we look at GFI, NFI, NNFI, CFI, and RMSEA, but also at the Akaike's Information Criteria (AIC), the Browne-Cudeck Criteria (BCC) and the Bayes Information Criteria (BIC)[4]. The last three measures are used to compare models, where one accepts the model with the lowest values. As results in table 4 demonstrate, model 5 is superior to model 2 across all of these indices. Therefore, we are confident that model 5 is indeed our "best model".

Table 2 compares the measurement structure of model 5 to that of model 1. The loadings are highly consistent across the two models. Table 5 presents results for our best (model 5) and theoretical models (model 2). Here, we can see that parameters from model 5 and model 2 are highly similar, a fact which indicates parameters are robust. In table 5, the first 7 rows summarize path coefficients, Z-statistics, and significance tests of our best model. The next 15 rows summarize the control paths, and the following 11 rows, covariances.

<< Figure 2 and Tables 1 through 5 about here >>

Relational Governance and Collective Efficiency Hypotheses

Based on our analysis of model 5, six of the seven hypotheses receive support. Primarily, all hypotheses related to the impact of *horizontal governance* on *collective efficiencies* specified in our theory are supported. The path coefficient associated with H1 (i.e. *relational governance of horizontal ties associates positively with sourcing of collective resources*) is

[4] The AIC can be said to represent an operational way of trading off the complexity of an estimated model against how well the model fits the data (Akaike, 1987). Another measure with a similar intent, the BCC is known to impose a slightly greater penalty for model complexity than does the AIC (Browne & Cudeck, 1993). In comparison to AIC and BCC, the BIC assigns a greater penalty to model complexity, and so has a greater tendency to pick parsimonious models (see Raftery, 1995; Schwartz, 1978 for reviews).

positive (0.18) and statistically significant (Z=2.72; p<0.001). H3a (i.e. *relational governance of horizontal ties associates positively with product innovation*) is supported as well. The associated path coefficient is positive (0.29) and statistically significant (Z = 4.20; $p < 0.001$). Not all hypotheses related to the impact of vertical ties on collective efficiencies, however, receive support. On the one hand, H2, asserting that *relational governance of vertical ties positively associates with production efficiencies*, is strongly supported. The path coefficient is positive (0.34) and statistically significant ($Z = 4.70$; $p < 0.001$). There is no evidence, however, that relational governance of vertical relationships improve product innovation. Thus, H3b is not supported.

Collective Efficiencies and Access to Global Market Hypotheses

All hypotheses tracing the successful access to global markets to the particular collective efficiencies that associate with horizontal and vertical governance are supported. Particularly, hypotheses 4a, 4b and 4c respectively establish that *access to global markets positively associates with collective sourcing, manufacturing productivity and product innovation*. The path coefficients are positive and statistically significant (respectively, path = 0.27; $Z = 3.32$; $p < 0.001$ for hypothesis 4a; path = 0.25; $Z = 3.96$; $p < 0.001$ for hypothesis 4b; and path = 0.11; $Z = 1.69$; $p < 0.1$ for hypothesis 4c).

Testing Alternative Models

Because SEM provides information regarding the fit of a proposed model but cannot determine if that model is the "correct" one, we examine three theoretically plausible alternative models. The first alternative model (model 6) theorizes that horizontal governance and vertical governance *directly* affect SMEs abilities to access global markets in addition to the mediated collective efficiencies effects. Direct effects are plausible in that firms may simply coordinate export efforts without engaging in deliberate actions to achieve the particular forms of collective efficiencies discussed here. The second alternative model

(model 7) includes interaction terms between collective efficiencies and access to global markets. These interactions identify ways in which distinct types of collective efficiencies may complement one another in the achievement of superior export performance. For instance, manufacturing productivity may create cost advantages and hence increase the degree to which SMEs with innovative products can access global markets. The third alternative (model 8) differs from the best model (model 5) in that it suggests an interaction between horizontal and vertical relationships onto collective efficiencies. Our expectation arises from previous theorizing that firms do integrate such forms of partnerships to attain not only innovation, but also manufacturing productivity (e.g. Choi *et al*, 2002; Lazzarini *et al*, 2001; Teece, 1992: 9) – e.g. in our case, if horizontal ties provide scale and coordination to the group, vertical partners may have improved channels to export their supplies.

We rely on an analysis of AIC, BCC, and BIC goodness of fit indices to contrast the best model with the alternative models. [5]As it can be seen in table 4, none of the alternative models result in improvements from our best model. Specifically, ΔAIC, ΔBCC, and ΔBIC are all positive, indicating an increase in these goodness of fit indices. We therefore conclude that model 5 is indeed the best model of how SMEs attain superior export performance.

Interpretation of Results

Our findings indicate that by coordinating their joint actions through horizontal and vertical relational governance, SMEs can attain a set of collective efficiencies that contribute to superior access to global markets. Specifically, we find that particular types of relationships (i.e. horizontal or vertical) yield different types of collective efficiencies. While horizontal relational governance promotes the provision of collective inputs and product innovation, vertical relational governance yields manufacturing productivity gains along the supply chain. Our finding that product innovation is mostly restricted to horizontal

[5] Here, we avoid comparisons through chi-square statistics since some of our alternative models are *non nested*. The *non nested* nature of our models arises from our implementing Ping's interaction term procedure (1995, 1996), which, as explained above, creates a new single-indicant variable from two other factors.

relationships in our context is interesting because it is somewhat inconsistent with received theory that knowledge exchange among horizontal competitors tends to be more difficult than in transactions involving vertically related partners, who are not in direct competition (Choi *et al*, 2002; Brandenburger & Nalebuff, 1997). Our results also indicate that superior export performance associates with a host of collective efficiencies – sourcing of collective resources, manufacturing productivity, and product innovation – which require complex links among local partners. Our test of the best-unconstrained model indicates, however, that there are no synergistic effects among those collective efficiencies. Put another way, it appears that the collective efficiencies outlined in our model work independently of one another.

Moreover, from our alternative models, it seems the direct effects of horizontal and vertical relational governance on access to global markets are insignificant in light of the mediator effects of collective efficiencies (model 6). These results suggest that the engine behind SME's global competitiveness is the set of collective efficiencies firms attain from their horizontal and vertical ties. In other words, collective efficiencies appear to mediate the impact of vertical and horizontal relationships on SMEs' abilities to access global markets. Additionally, we did not find synergistic effects among the different types of collective efficiencies (model 7), nor interaction effects among horizontal and vertical partnerships (model 8) that could explain gains beyond those they would get by simply adding those partnerships to their portfolio of ties. Horizontal and vertical relationships appear, in our context, to have independent effects triggering different types of collective efficiencies.

Control Effects. As it can be seen from Table 5, the factors 'firm size' and 'competitive pressure' help partially explain why some firms are more active in accessing global markets than others. However, these factors do not appear to concomitantly explain any of our three forms of collective efficiencies. We thus remain confident that collective efficiencies are powerful mediating factors behind the success of Argentine small and medium wood

furniture makers in competitively accessing global markets. Second, our control for the degree of investments in JIT, TQM and IT also indicates that relational governance between peer firms and buyers and suppliers do not result from such investments. This indicates that firms investing in these production and innovation capabilities do not become more likely or more attractive to form stronger partnerships with other firms. According to entrepreneurs interviewed, this happens because a firm's investments in JIT relates more to limited internal changes to manufacturing layout and inventory control than to the implementation of seamless JIT systems linking all partners in a supply chain. We are therefore more confident that the association between relational governance and collective efficiencies are in the direction proposed, and do not appear to be subject to spurious effects. Lastly, our control of "export orientation" does seem to indicate that firms with stronger beliefs about exports seem to enjoy greater levels of exports, although it does not indicate that firms with such beliefs are more likely to jointly pursue governmental support for their efforts. We thus believe that the association between collective sourcing and access to global markets is indeed robust.

IMPLICATIONS AND CONCLUSION

In this study, we model how SMEs can overcome their weak infrastructure and poor institutions environment, so as to garner export-enhancing collective efficiencies. Specifically, we submit that the relational governance of horizontal ties (i.e. relationships with local peer firms) promotes collective sourcing of resources and superior innovation rates. Likewise, the relational governance of vertical ties (i.e. relationships with local suppliers) enables higher manufacturing productivity. Such efficiencies, in turn, associate with SMEs' improved access to global markets. Our empirical results, using data from a group of Argentine wood furniture manufacturers generally supports our model.

Our research brings significant implications for the management literature. Primarily, our model integrates three theoretical perspectives – the resource-based view, transaction cost

economics, and institutional theory – and in the process, highlights important aspects of their interactions. For example, previous research hinted that institutional constraints found in emerging economies limits possibilities for resource access (e.g. Hoskisson et al., 2000; Peng & Heath, 1996), and call for further research to examine the interstices of these two theoretical perspectives. Hoskisson *et al* (2000: 256-257) indicates that little research using a resource-based view has examined strategy differences in social contexts of emerging economies, or even the value of intangible relationship-based resources (as opposed to product-market-based ones). Here, our theoretical and empirical analyses illustrate how SMEs overcome institutional shortages by *institutionalizing* behavioral commitments and norms within particular partnerships. Network ties therefore help substitute for the lack of a stronger institutional settings, and enable the combination of interfirm complementary resource endowments that associate with export-enhancing collective efficiencies.

Our study also highlights important institutional factors leading to choices of relationship governance under threats of exchange hazards. Particularly, many criticisms towards the transaction cost literature mention that this theory has been primarily applied to developed market contexts, which are often characterized by strong legal regimes and binding social norms; less is known about governance structures devised to govern transactions in emerging economies (Hoskisson *et al*, 2000: 254). In contexts where official discretion as opposed to the rule of law describes property rights, the enforcement of contracts is unlikely to occur (la Porta, Lopez de Silanes, Schleifer, & Vishny, 1997). In these circumstances, the coordination of either resource complementarities or joint resource-acquisition efforts by local SMEs (in search of collective efficiencies) could be threatened by the impossibility of their forming contractual safeguards to reduce the opportunistic behavior and transaction costs. Indeed, in our survey we found that only 4 firms had formal contracts with partners; interviews indicated entrepreneurs mistrust their country's legal system and thus deem such *formalities*

useless. In a way, our findings support Peng & Heath's (1996) suggestions that in emerging economies, owing to the lack of property rights and unstable institutional environments, firms may strengthen informal ties to reduce transactional hazards and pool resources to achieve scale and scope economies that are unavailable otherwise.

In addition to helping better integrate the above discussed theoretical perspectives, our study also reconciles several models of interfirm alliances. Although the received alliance literature has advanced our knowledge on the sources of inter organizational value creation, studies have often focused on particular types of interfirm ties (i.e. horizontal or vertical - see for example Doz & Hamel, 1998; Dyer, 1997; Gulati, 1999; Helper, 1991; Kogut, 1988). The challenges posed by weak infrastructure and institutional difficulties in emerging economies, however, are likely to require the integration of both vertical and horizontal ties. Consider for example the following illustration, taken from an interview with a prominent small wood furniture maker in Argentina. She revealed that her focus as a CEO had always been on excelling at the coordination of vertical partnerships along the supply chain. Through such efforts, she managed to obtain competitive production costs vis-à-vis her local competitors. However, given her small scale, she felt that it would be difficult to leverage such competencies in foreign markets; finding and engaging international customers proved too costly for her to "do it alone." Her scale liabilities, she argued, could even prove to be fatal, given the fast-shrinking Argentine market of the early 21st century. To circumvent these limitations, the entrepreneur had to interact with local peers to accrue other equally important joint activities – for example, the collective lobbying of the foreign ministry of Argentina to support the search for international clients and the sharing of costs to advertise products in international fairs. In sum, besides developing competencies in supply chain management resulting from her vertical partnerships, she also managed to craft horizontal ties with competitors to overcome her small scale and poor export infrastructure of her country. By

integrating distinct types of ties and exploring how they enable firms to create competitive advantages, our model is better able to accommodate the more complex patterns of partnering that occur among SMEs. Therefore, our model contributes to recent research on interfirm relations integrating different forms of relationships found among firms (e.g. Brandenburger & Nalebuff's 'value net', 1997; Choi *et al.*'s 'vertical and horizontal relationships' model, 2002; Lazzarini's *et al* 'netchains', 2001). In particular, our model submits that horizontal and vertical ties create value in very specific ways, i.e. they yield very particular forms of collective efficiencies which mediate the access of SMEs to global markets.

Our study also contributes to an important and growing stream of the literature dealing with international management. This literature has often focused on international alliances as a means of enabling firms to globally source commodities (Murray, Masaaki, & Wildt, 1995), knowledge (Simonin, 1999; Zhao et al., 2004) or cutting edge technologies (Nordberg, Campbell, & Verbeke, 1996). Our research focuses instead on the role of *local* alliances in fostering firms' ability to compete globally through collective sourcing of resources, manufacturing productivity, and product innovation. Specifically, our focus is on the economies enabled by local partnerships and how they matter for SMEs' access to global markets. This shift in focus (international alliances versus local alliances to go global) integrates the strategic alliances and entrepreneurship research streams, as pointed by Hitt, Ireland, Camp & Sexton (2001), and turns out to be considerably more useful for entrepreneurial ventures which may yet lack the resources to go abroad to begin with or even establish international alliances.

Lastly, our study adds to a growing stream of the literature in strategy and entrepreneurship dealing with the emergence and competitiveness of clusters (i.e. sectoral and geographical concentrations of firms, Schmitz & Nadvi, 1999: 1503). While early cluster literature accentuated the benefits that passively resulted to firms from their geographically

agglomerating into larger markets (for example, bigger and more specialized pools of labor and supply – Schmitz & Nadvi, 1999), recent treatments of the concept have tended to move away from this emphasis on passive agglomeration economies towards that of active networking among clustered firms. Given the complex interfirm interdependencies occurring in clusters, firms can consciously build cooperative governance structures so as to improve cluster-wide competitiveness (see also Christopherson & Storper, 1986; Markusen, 1999; Mesquita, 2007; Storper, 1997; Tallman et al., 2004). Our study contributes to this latter trend of the cluster literature by outlining specific mechanisms through which firms that properly coordinate their actions with other firms perform better than those firms that do not. Further, though literature to date has relied excessively on anecdotal accounts instead of rigorous theorizing, and case studies, instead of meticulous statistical validation (see the criticisms in Gordon & McCann, 2000: 17; Martin & Sunley, 2003: 16), our study integrates three important theoretical streams to model clustered SMEs' interfirm relationships to collective efficiencies and access to global markets and applies modern quantitative techniques – including the interaction terms of structural models.

Admittedly our research is limited in some ways, which suggest several opportunities for future research. First, our study is limited in scope, as it suits a particular context – that of firms sharing environments with limited infrastructure and weak institutions, such as emerging economies. We do not evaluate whether our argument holds in other settings. A possible extension of our study would contrast our model in developed vis-à-vis emerging countries. Arguably, developed countries in general exhibit stronger legal institutions that increase the viability of alternative forms of contracting (e.g. formal contracts, equity-based partnerships, and joint ventures). Further, governments tend to be more effective in the provision of public goods. Thus, we can suppose that SMEs in emerging markets resort to inter organizational relationships supported by informal, relational means of governance to a

greater degree than SMEs in developed economies (e.g., Peng & Heath, 1996). Future research should therefore try to examine relationships among SMEs in a diverse set of countries in a way that the costs and likelihood of contractual enforcement vary.

Although we expect that the role of relational governance in creating collective efficiencies will decrease when formal institutions become more efficient, we believe that, even in countries with stronger institutions, interfirm relationships will still have a role in creating collective efficiencies jointly with formal means of governance. Recent research has discussed complementarities among formal and informal means of governance (e.g. Poppo & Zenger, 2002). For instance, relational governance can help enforce exchange dimensions that are difficult to specify in formal contracts (Lazzarini, Miller, & Zenger, 2004), while formal contracts can align expectations and provide guidance for the development of long term relationships (Mayer & Argyres, 2004).

Additionally, our paper also observes only the benefits of relational governance and disregards its costs – for instance, the "overembeddedness" that may result when long-term partners avoid transacting with new actors and hence fail to benefit from novel information and opportunities (e.g. Uzzi, 1997). We are interested, however, in environments subject to weak institutions, where establishing relational governance is often the only way to govern inter organizational arrangements that are critical for the creation of collective efficiencies. It is possible that in settings involving stronger institutions SMEs will be able to use contracts and other formal means of governance to support relationships with shorter duration and hence avoid the risk of "overembeddedness". Therefore, another important issue that future research should observe is whether SMEs maintain partners for longer periods of time or adopt a more arm's length approach by switching partners from time to time.

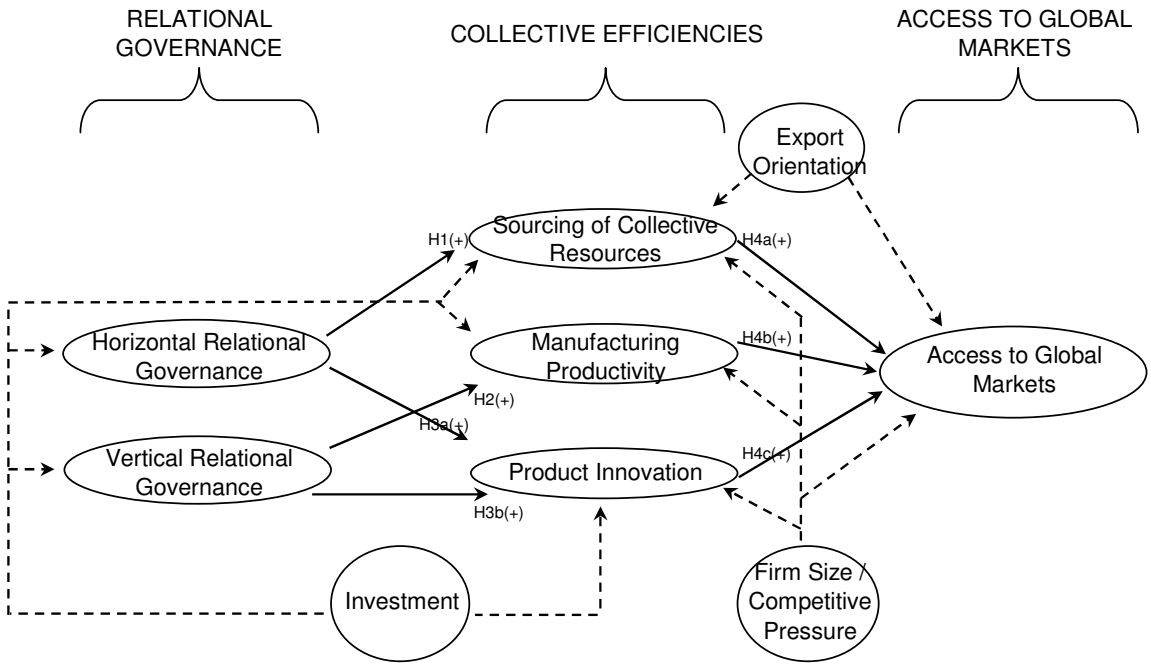
Lastly, our methods can be improved. Future research may tackle similar phenomena through the use of panel datasets that observe SMEs through time. In this case, one could

examine how past efforts to develop relational ties create collective efficiencies in future periods. One could also model how vertical and horizontal relationships appear and evolve over time – an issue we do not tackle in the present study, but that is critical to advise SME managers about how to leverage local partnerships to better access global markets.

Despite the limitations mentioned above, our hope is that our study will help encourage future research to examine SMEs global competitiveness through the interaction of alternative theoretical streams.

TABLES AND FIGURES

Figure 1
Theoretical Model: Interfirm Relationships among SMEs in Developing Economies



Obs: This is a simplified version of the actual model. It does not show error terms, exogenous factor variances, disturbance terms, the error correlations, or correlations between exogenous factors. Full line paths are hypothesized effects. Dotted paths are control paths.

Table 1
Basic Statistics & Pearson Matrix

			Mean	S.D.	Kurtosis	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HG1	1	Horizontal norms of information exchange	2.35	1.28	-0.90	1.00																			
HG2	2	Horizontal norms of assistance	2.38	1.24	-0.79	.80(**)	1.00																		
HG3	3	Horizontal norms of fair sharing	2.38	1.27	-1.02	.80(**)	.83(**)	1.00																	
VG1	4	Vertical norms of information exchange	2.75	1.09	-0.72	.35(**)	.37(**)	.35(**)	1.00																
VG2	5	Vertical norms of assistance	2.77	1.09	-0.68	.36(**)	.35(**)	.34(**)	.73(**)	1.00															
VG3	6	Vertical norms of fair sharing	2.72	1.07	-0.81	.35(**)	.33(**)	.32(**)	.75(**)	.72(**)	1.00														
INV1	7	Manufacturing Productivity	13.98	7.94	-0.67	0.10	0.11	0.10	.28(**)	.21(**)	.26(**)	1.00													
INN1	8	% Revenues from new products	15.67	8.11	-0.25	.20(**)	.22(**)	.26(**)	0.04	.16(*)	0.06	.15(*)	1.00												
INN2	9	% New products in catalogue	15.72	8.07	-0.30	.19(**)	.19(**)	.24(**)	0.04	.15(*)	0.08	0.13	.97(**)	1.00											
CS1	10	Collective sourcing for contacting international customers	2.33	1.00	-0.73	.15(*)	.17(*)	.20(**)	0.05	0.12	.17(*)	0.09	0.05	0.04	1.00										
CS2	11	Collective sourcing for coordinating international fairs	2.32	1.02	-0.60	0.09	0.13	.16(*)	-0.03	0.09	0.08	0.09	0.01	0.00	.72(**)	1.00									
CS3	12	Collective sourcing for promotion of 'country brand'	2.32	1.02	-0.58	0.12	.14(*)	.17(**)	0.03	0.08	0.05	.131(*)	0.02	0.00	.67(**)	.68(**)	1.00								
AG1	13	% products that are exported	18.63	11.30	0.99	.19(**)	.18(**)	0.13	.16(*)	.19(**)	.14(*)	.28(**)	.14(*)	0.11	.22(**)	.21(**)	.24(**)	1.00							
SIZ1	14	Firm size - log sales in US$	5.49	0.52	-0.77	0.01	0.07	0.05	0.12	.15(*)	.15(*)	0.07	-0.01	-0.03	.13(*)	0.09	0.12	.17(**)	1.00						
SIZ2	15	Firm size - log employees	1.16	0.23	-0.64	-0.02	0.02	0.00	0.07	0.10	0.06	0.05	-0.05	-0.06	0.08	0.07	0.07	.17(**)	.89(**)	1.00					
COMP 1	16	Market pressure - log competitors	2.36	1.68	-1.26	0.11	0.05	0.04	-0.05	-0.02	-0.01	-0.03	-0.01	0.00	0.00	-0.04	0.02	.18(**)	-0.11	-.13(*)	1.00				
EO1	17	Exporters are more competitive	2.42	1.45	-1.15	0.04	0.01	0.01	0.07	0.03	-0.04	0.03	-0.01	0.00	-0.02	0.03	0.08	.28(**)	-0.12	-0.11	.27(**)	1.00			
EO2	18	Exporters are more protected from recession	2.44	1.52	-1.05	0.03	-0.01	0.00	0.04	0.00	-0.06	0.01	-0.03	-0.01	0.02	0.04	0.08	.16(*)	-.14(*)	-.13(*)	.27(**)	.86(**)	1.00		
INV1	19	Investments in JIT	2.29	1.29	-0.09	-0.01	-0.10	-0.03	-0.03	0.02	-0.01	.33(**)	.27(**)	.26(**)	-0.10	-0.11	-0.05	.15(*)	0.02	0.05	0.06	0.00	-0.02	1.00	
INV2	20	Investments in IT equipment & processes	2.39	1.24	-0.79	0.00	-0.07	-0.03	-0.01	0.01	-0.01	.28(**)	.20(**)	.20(**)	-.13(*)	-.135(*)	-0.04	0.11	-0.04	0.01	-0.03	-0.01	-0.02	.776(**)	1.00
INV3	21	Investments in TQM	2.37	1.31	-1.02	-0.02	-0.11	-0.03	-0.03	0.01	-0.03	.20(**)	.21(**)	.20(**)	-0.09	-.13(*)	-0.12	0.00	-0.04	0.01	-0.03	-0.06	-0.05	.745(**)	.585(**)

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2
Comparison of Measurement Model to Best Model

				Measurement Model		Best Model	
Observed Variable		Latent Factor		loading	C.R.	loading	C.R
HG1	Horizontal norms of information exchange	F1	Horizontal Relational Governance	1.002		0.958	
HG2	Horizontal norms of assistance	F1	Horizontal Relational Governance	1.000	21.064	1.000	20.973
HG3	Horizontal norms of fair sharing	F1	Horizontal Relational Governance	0.958	19.755	1.001	19.695
VG1	Vertical norms of information exchange	F2	Vertical Relational Governance	1.000		1.000	
VG2	Vertical norms of assistance	F2	Vertical Relational Governance	0.962	14.930	0.96	14.847
VG3	Vertical norms of fair sharing	F2	Vertical Relational Governance	1.026	15.862	1.025	15.662
CS1	Contacting international customers	F3	Sourcing of Collective Resources	1.000		1.000	
CS2	Coordinating international fairs	F3	Sourcing of Collective Resources	1.025	14.038	1.024	14.006
CS3	Promotion of 'country brand'	F3	Sourcing of Collective Resources	0.961	13.282	0.961	13.297
INV1	Manufacturing Productivity						
INN1	% Revenues from new products	F4	Product innovation	1.000		1.000	
INN2	% New products in catalogue	F4	Product innovation	0.982	12.597	0.971	12.551
AG1	Access to Global Markets						
SIZ1	log sales in US$	F5	Firm size	1.000		1.000	
SIZ2	log employees	F5	Firm size	0.983	13.643	0.924	12.851
COMP1	Market Pressure						
EO1	Exporters are more competitive	F6	Export Orientation	1.000		1.000	
EO2	Exporters are more protected from recession	F6	Export Orientation	0.977	11.145	0.974	11.112
INV1	Investments in JIT	F7	Investment	1.000		1.000	
INV2	Investments in IT equipment & processes	F7	Investment	1.094	12.588	1.095	12.631
INV3	Investments in TQM	F7	Investment	1.067	13.969	1.059	13.989

Table 3
Chi square difference test

$\chi 2$ difference test among following factors and variables				χ^2 statistics		chi-sq > 3.85
				(d.f. = 149)	(d.f. = 148)	(d.f.1)
F1	Horizontal Relational Governance	F2	Vertical Relational Governance	199.0	155.4	43.6
F1	Horizontal Relational Governance	F3	Sourcing of Collective Resources	231.7	155.4	76.3
F1	Horizontal Relational Governance	INV1	Manufacturing Productivity	236.5	155.4	81.1
F1	Horizontal Relational Governance	F4	Innovation	215.0	155.4	59.6
F1	Horizontal Relational Governance	AG1	Access Global Markets	221.3	155.4	65.9
F1	Horizontal Relational Governance	F5	Firm Size	283.4	155.4	128.0
F1	Horizontal Relational Governance	COMP1	Competitive Pressure	207.8	155.4	52.4
F1	Horizontal Relational Governance	F6	Export Orientation	215.7	155.4	60.3
F1	Horizontal Relational Governance	F7	Investments	267.5	155.4	112.1
F2	Vertical Relational Governance	F3	Sourcing of Collective Resources	248.4	155.4	93.0
F2	Vertical Relational Governance	INV1	Manufacturing Productivity	212.4	155.4	57.0
F2	Vertical Relational Governance	F4	Innovation	241.3	155.4	85.9
F2	Vertical Relational Governance	AG1	Access Global Markets	222.7	155.4	67.3
F2	Vertical Relational Governance	F5	Firm Size	264.8	155.4	109.4
F2	Vertical Relational Governance	COMP1	Competitive Pressure	226.5	155.4	71.1
F2	Vertical Relational Governance	F6	Export Orientation	219.0	155.4	63.6
F2	Vertical Relational Governance	F7	Investments	160.7	155.4	5.3
F3	Sourcing of Collective Resources	INV1	Manufacturing Productivity	164.0	155.4	8.6
F3	Sourcing of Collective Resources	F4	Innovation	255.5	155.4	100.1
F3	Sourcing of Collective Resources	AG1	Access Global Markets	215.3	155.4	59.9
F3	Sourcing of Collective Resources	F5	Firm Size	276.2	155.4	120.8
F3	Sourcing of Collective Resources	COMP1	Competitive Pressure	225.2	155.4	69.8
F3	Sourcing of Collective Resources	F6	Export Orientation	217.4	155.4	62.0
F3	Sourcing of Collective Resources	F7	Investments	284.9	155.4	129.5
INV1	Manufacturing Productivity	F4	Innovation	227.7	155.4	72.3
INV1	Manufacturing Productivity	AG1	Access Global Markets	203.3	155.4	47.9
INV1	Manufacturing Productivity	F5	Firm Size	278.7	155.4	123.3
INV1	Manufacturing Productivity	COMP1	Competitive Pressure	222.4	155.4	67.0
INV1	Manufacturing Productivity	F6	Export Orientation	213.0	155.4	57.6
INV1	Manufacturing Productivity	F7	Investments	204.3	155.4	48.9
F4	Innovation	AG1	Access Global Markets	224.5	155.4	69.1
F4	Innovation	F5	Firm Size	294.9	155.4	139.5
F4	Innovation	COMP1	Competitive Pressure	218.1	155.4	62.7
F4	Innovation	F6	Export Orientation	217.4	155.4	62.0
F4	Innovation	F7	Investments	211.1	155.4	55.7
AG1	Access Global Markets	F5	Firm Size	255.6	155.4	100.2
AG1	Access Global Markets	COMP1	Competitive Pressure	189.6	155.4	34.2
AG1	Access Global Markets	F6	Export Orientation	182.8	155.4	27.4
AG1	Access Global Markets	F7	Investments	229.3	155.4	73.9
F5	Firm Size	COMP1	Competitive Pressure	254.4	155.4	99.0
F5	Firm Size	F6	Export Orientation	269.1	155.4	113.7
F5	Firm Size	F7	Investments	285.1	155.4	129.7
F6	Export Orientation	F7	Investments	291.8	155.4	136.4

Table 4
Model Statistics and Testing Sequence Across Models

Model	Model Name	Chi-Sq	Df	Probability	GFI	NFI	NNFI	CFI	RMSEA	AIC	BCC	BIC
	Null	155.41	193	> .5								
1	Measurement	155.41	147	0.364	0.94	0.95	0.97	0.998	0.01	317.3	334.35	596.49
2	Theoretical	231.51	167	>0.01	0.91	0.93	0.94	0.981	0.04	353.39	366.23	563.64
3	Next-best constrained	246.3	168	>0.01	0.91	0.93	0.94	0.976	0.04	366.21	378.84	573.01
4	Next-best unconstrained	231.35	165	>0.05	0.91	0.93	0.94	0.980	0.04	357.28	370.54	574.42
5	Best model	162.4	160	0.5	0.94	0.95	0.96	0.997	0.01	298.35	312.67	532.73
6	Alternative model 1	160.23	157	0.5	0.94	0.95	0.95	0.998	0.00	300.23	314.97	541.50
7	Alternative model 2	1503.93	222	0.001	0.74	0.68	0.68	0.710	0.16	1653.93	1672.13	1912.43
8	Alternative model 3	192.23	177	0.25	0.93	0.94	0.94	0.980	0.02	338.26	354.4	589.87

Testing Sequence and Difference Tests

Comparison	ΔX^2	Probability	Δdf	Δ AIC	Δ BCC	Δ BIC	Model Preference
model 2 vs. 3	14.79	<0.001	1	12.82	12.61	9.37	2
model 2 vs. 4	-0.16	>0.1	-2	3.89	4.31	10.78	2
model 2 vs. 5	-69.11	<0.001	-7	-55.04	-53.56	-30.91	5
model 5 vs. 6	-2.17	>0.1	-3	1.88	2.30	8.77	5
model 5 vs. 7	1341.53	<0.001	62	1355.58	1359.46	1379.70	5
model 5 vs. 8	29.83	<0.001	17	39.91	41.73	57.14	5

Note1: The variance-covariance matrix of the best model (model 5) is based on 231 moments (21 observed variables). These moments are used to estimate the following 71 parameters: 11 factor loading paths, 21 causal paths, 18 variances of measurement errors, 4 variances of exogenous factors, 6 variances for estimation errors of endogenous factors, and 11 covariance paths among exogenous latent factors. For the more avid reader wishing to replicate our results, we indicate these covariance paths (along with covariance paths of model 2) in table 5.

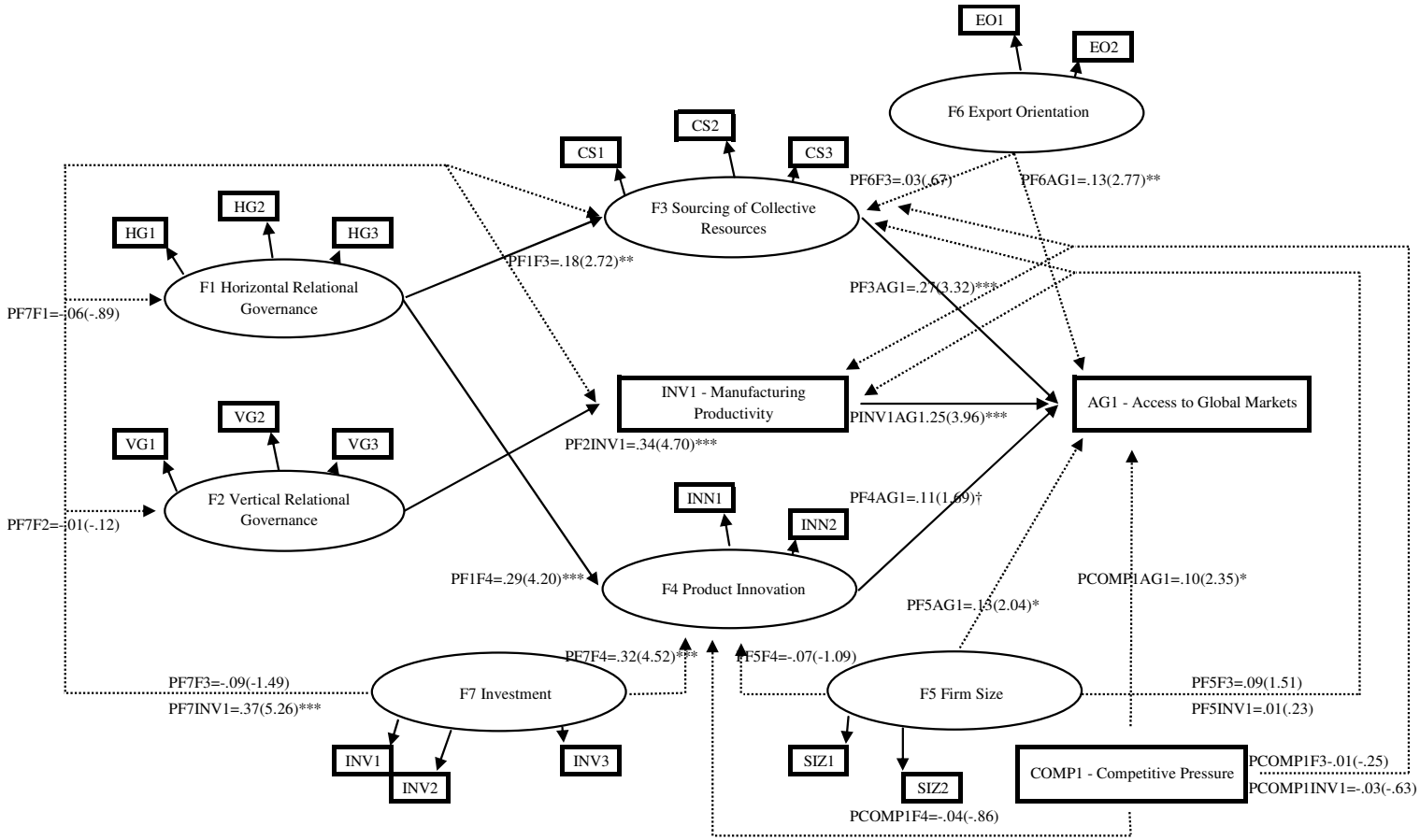
Note2: results above are based on maximum likelihood (ML) estimation, which tends to produce unbiased estimators under assumptions of normality (Browne & Cudeck, 1993). Critics argue, however, that ML-estimators rely heavily on the assumption of normal distribution, and propose that small sample analysis (such as this one) should rely instead on the Generalized Least Squares (GLS) method. As a comparison, GLS estimates for model 5 are as follows: GFI = 0.93; NFI = 0.94; NNFI = 0.95; CFI = 0.98; RMSEA = 0.02. We are thus confident our data set does not severely depart from normality.

Table 5
Results: Path Coefficients and Covariance Paths from Theoretical and Best Models

			Theoretical Model (model 2)	Best-model (model 5)	
Path Name	Path description		Path	Path	Critical Ratio
Hypothesis 1	PF1F3	Horizontal Relational Governance --> Sourcing of Collective Resources	0.18**	0.18**	2.72
Hypothesis 2	PF2INV1	Vertical Relational Governance --> Manufacturing Productivity	0.34***	0.34***	4.70
Hypothesis 3a	PF1F4	Horizontal Relational Governance --> Product Innovation	0.30***	0.29***	4.20
Hypothesis 3b	PF2F4	Vertical Relational Governance --> Product Innovation	-0.01		
Hypothesis 4a	PF3AG1	Sourcing of Collective Resources --> Access to Global Markets	0.27***	0.27***	3.32
Hypothesis 4b	PINV1AG1	Manufacturing Productivity --> Access to Global Markets	0.25***	0.25***	3.96
Hypothesis 4c	PF4AG1	Product Innovation --> Access to Global Markets	0.11†	0.11†	1.69
Control	PF5AG1	Firm Size --> Access to Global Markets	0.14*	0.13*	2.04
Control	PF5F3	Firm Size --> Sourcing of Collective Resources	0.09	0.09	1.51
Control	PF5INV1	Firm Size --> Manufacturing Productivity	0.01	0.01	0.22
Control	PF5F4	Firm Size --> Product Innovation	-0.07	-0.07	-1.09
Control	PCOMP1AG1	Competitive Pressure --> Access to Global Markets	0.10†	0.10†	2.35
Control	PCOMP1F3	Competitive Pressure --> Sourcing of Collective Resources	-0.01	-0.01	-0.25
Control	PCOMP1INV1	Competitive Pressure --> Manufacturing Productivity	-0.03	-0.03	-0.63
Control	PCOMP1F4	Competitive Pressure --> Product Innovation	-0.04	-0.07	-1.12
Control	PF7F3	Investments --> Sourcing of Collective Resources	-0.10†	-0.09	-1.49
Control	PF7INV1	Investments --> Manufacturing Productivity	0.37***	0.37***	5.26
Control	PF7F4	Investments --> Product innovation	0.32***	0.32***	4.52
Control	PF7F1	Investments --> Horizontal Relational Governance	-0.06	-0.06	-0.89
Control	PF7F2	Investments --> Vertical Relational Governance	-0.01	-0.01	-0.12
Control	PF6AG1	Exports orientation --> Access to global markets	0.13**	0.13*	2.77
Control	PF6AF3	Exports orientation --> Sourcing of Collective Resources	0.03	0.03	0.67
Covariance	D(F1) x D(F2)	Residual of Horizontal Relational Governance <--> Residual of Vertical Relational Governance		0.35***	5.51
Covariance	D(F1) x D(COMP1)	Residual of Horizontal Relational Governance <--> Error term of Competitive Pressure		0.09	1.08
Covariance	D(F2) x E(COMP1)	Residual of Vertical Relational Governance <--> Error term of Competitive Pressure		-0.03	-0.39
Covariance	D(F3) x E(INV1)	Residual of Sourcing of Collective Resources <--> Error term of Manufacturing Productivity		0.10*	2.00
Covariance	D(F3) x D(F4)	Residual of Sourcing of Collective Resources <--> Residual of Product Innovation		0.01	0.20
Covariance	E(INV1) x D(F4)	Error term of Manufacturing Productivity <--> Residual of Product Innovation		0.03	0.47
Covariance	E(COMP1) x F5	Error term of Competitive Pressure <--> Firm Size		-0.20*	-2.03
Covariance	E(COMP1) x F6	Error term of Competitive Pressure <--> Export Orientation		0.61***	4.15
Covariance	F6 x F5	Export Orientation <--> Firm Size	-0.20*	-0.20*	-1.99
Covariance	F7 X F6	Investments <--> Export Orientation	-0.04	-0.04	-0.46
Covariance	F7 x F5	Investments <--> Firm Size	0.05	0.05	0.76

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Figure 2
Best model



Note. We follow the Bentler's (1989) EQS convention of identification: "F" = Factor, "P" = Path (e.g. PF1F3 = path from factor F1 to factor F3). Ellipses are latent factors, whereas rectangulars are observed variables. Full line arrows are Paths, dotted-line arrows are controls. This simplified version of the actual best model does not show error terms, exogenous factor variances, endogenous variable disturbance terms, covariance paths, and error correlations. For the more avid reader wishing to replicate our results, covariance paths are included in table 5.

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