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# THE RELATIONSHIP BETWEEN SUPPLIER SPECIFIC INVESTMENT AND NEW PRODUCT PERFORMANCE: THE MODERATING EFFECTS OF OUTPUT AND PROCESS CONTROL <sup>1</sup>

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## ABSTRACT

In order to improve the performance of new products, companies in emerging markets should manage their connections with suppliers in ways that are more clearly understood as a result of this study. Approaching from the perspective of relational view and transactional cost economics theory, we dissect the effects of two control mechanisms, namely process and outcome control on the relationship between manufacturer specific investment in suppliers and new product performance. Using a dyadic data, which consists of 125 dyads (i.e., 125 manufacturers and 125 main suppliers) in Turkey, we find that supplier specific investment increases new product performance of manufacturers. We also find that output control direct and positively relates to new product performance while process control has a negative effect on new product performance. Finally, the results reveal that output control positively moderate the relationship between supplier specific investment and new product performance. Contrarily, process control has a negative effect on the supplier specific investment – new product performance relationship.

**Keywords:** Supplier specific investment, output control, process control, new product performance

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## TEDARİKÇİYE ÖZEL YATIRIM İLE YENİ ÜRÜN PERFORMANSI ARASINDAKİ İLİŐKİ: ÇIKTI VE SÜREÇ KONTROLÜNÜN YÖNLENDİRİCİ ETKİLERİ

### ÖZ

Gelişmekte olan pazarlardaki şirketler, yeni ürünlerin performansını iyileştirmek için tedarikçilerle olan bağlantılarını bu çalışma sonucunda daha net anlaşılacak şekilde yönetmelidir. Bu araştırma özelinde ilişkisel bakış ve işlemsel maliyet ekonomisi perspektifinden yaklaşarak, iki kontrol mekanizmasının, yani süreç ve sonuç kontrolünün, tedarikçilere özel yatırım ve yeni ürün performansı arasındaki ilişki üzerindeki etkilerini incelenmektedir. Bu çalışmada Türkiye'de toplanan 125 ikiliden (yani 125 üretici ve 125 ana tedarikçi) oluşan veri seti, tedarikçiye özel yatırımın üreticilerin yeni ürün performansı arasında olumlu bir ilişki ortaya koymaktadır. Ayrıca, sonuçlar çıktı kontrolünün yeni ürün performansı ile doğrudan ve olumlu bir şekilde ilişkili olduğunu, süreç kontrolünün ise yeni ürün performansı üzerinde olumsuz bir etkiye sahip olduğunu gösteriyor. Son olarak, bu çalışmada sunulan sonuçlar, çıktı kontrolünün tedarikçiye özel yatırım ile yeni ürün performansı arasındaki ilişkiyi olumlu yönde etkilediğini ortaya koymaktadır. Aksine, ampirik veri analizi süreç kontrolü, tedarikçiye özgü yatırım – yeni ürün performansı ilişkisi üzerinde olumsuz bir etkiye sahip olduğunu göstermektedir.

**Anahtar kelimeler:** Tedarikçiye özel yatırım, süreç kontrolü, çıktı kontrolü, yeni ürün performansı

## 1. Introduction

The impacts of new products on company performance are much stronger in developing markets than in developed economies, making new product creation a crucial performance indicator of successful marketing strategies (Bahadir, Bharadwaj and Srivastava, 2015; O’Cass and Heirati, 2015; Srivastava, 2018). Nevertheless, small and medium-sized businesses (henceforth, SMEs) in emerging economies have less access to loan or equity capital both internally and externally than larger companies (e.g., Yeniaras and Golgeci, 2023; Schiffer and Weder, 2001). Due to insufficient internal resources, businesses inevitably require outside funding to operate, create new goods, and invest in production facilities (Yeniaras, Kaya and Dayan, 2020). Under such resource-constraints the relationships that enterprises establish with their suppliers give the SMEs right to use the skills and resources of those suppliers, which may be used to boost business (e.g., Hunt and Davis, 2008; Pulles, Ellegaard and Veldman, 2023) and new product success (e.g., Fang, Palmatier and Evans, 2008; Song and Di Benedetto, 2008). Nevertheless, supplier do not only distribute these skills and resources unequally among buyers (Mitsubishi and Greeve, 2009; Takeishi, 2002) but also, they mostly prioritize some buyers over others. This creates buyer heterogeneity in terms of competitiveness (Wang, Tai and Grover, 2013; Yeniaras, 2023). In this direction, a 2022 Price Waterhouse and Coopers & Lybrand survey on supply chain trends reveals that operations and technology opinion-leaders largely (68 percent of 244 participants) believe that supplier operational issues may become the micro-foundation of competitive advantage<sup>3</sup>. For instance, a recent lack of semiconductors forced automakers to reduce production by 1.3 million vehicles globally in the first quarter of 2021 (Keohane, Bushe and Miller, 2021). Similarly, a 2021 EY report<sup>4</sup> shows that 97 percent of the participation 200 senior-level supply chain executives identify supply chain disruption as a major risk. Such disruptions and operational issues that are highlighted as major concerns, imply that suppliers may prioritize some buyers over others in their resource allocation decisions (Pulles, et al., 2023; Yeniaras and Kaya, 2022).

Buyers’ investment in specific suppliers are recently documented in several studies as being an important factor in suppliers’ resource allocation decisions (e.g., Huo, Guo and Tian, 2023; Lo, Zanmarone and Ghosh, 2022; Pulles et al., 2023; Yoon and Moon, 2019). These supplier-specific investments (henceforth, SSIs) refer to the agreement partners’ hard-to-assign-or-move assets, whether they be tangible or intangible (Barney, 1999; Riordan and Williamson, 1985). SSIs can be made in either physical assets, such as specialized design tools and engineering procedures for a new product that is made to order, or in people assets,

3 Last access: 28/07/2022: <https://www.pwc.com/us/en/services/consulting/business-transformation/digital-supply-chain-survey.html>

4 Last access: 28/03/2023 [https://www.ey.com/en\\_tr/supply-chain/how-covid-19-impacted-supply-chains-and-what-comes-next](https://www.ey.com/en_tr/supply-chain/how-covid-19-impacted-supply-chains-and-what-comes-next)

such as task-specific training that is pertinent to client preferences or production competencies (Fang, Palmatier and Evans, 2008). SSIs are investments made by the purchasing organization that are only focused on a specific supplier. Therefore, SIs are frequently used to incentivize the supplier for the partnership and to return the investment made by the buyer (Bensaou and Anderson, 1999) in an effort to have access to heterogeneously distributed supplier resources (Wang, Huo, and Tian, 2021).

We draw from the relational view (Dyer and Singh, 1998), which suggests that relation-specific investments by partners yields firm-level performance benefits (e.g., Dyer and Hatch, 2006; Hunt and Davis, 2008; Kim and Choi, 2018; Pulles et al., 2023), and propose that supplier-specific investment may result in enhanced new product performance levels for the investing manufacturer. Nevertheless, the extant literature pertinent to relation-specific investment also indicates that there may be possible negative effects of such investments, which may take the form of a perceived lock-in effect (Dyer, Singh and Hesterly, 2018; Rokkan, Heide and White, 2003). This lock-in effect caused by the buyer's supplier-specific investment may lessen the necessity for the supplier to distribute its best resources. It may also create the opportunity for the supplier to distribute its resources to rival accounts without fear of negative consequences (Casciaro and Piskorski, 2005), since the bargaining power of the supplier that makes fewer investments increases (Dyer, Singh and Hesterly, 2018).

The buying firm that invests in specific suppliers seek to access supplier's resources to establish competitive advantage and enhance new product performance (Pulles et al., 2023). Nevertheless, the supplier may not be as motivated to allocate its valuable resources to the investing buyer due to perceived lock-in effects and increased bargaining power. Accordingly, drawing from the transaction cost economics theory (henceforth, TCE) (Williamson, 1979), we suggest that the twin concepts of formal control mechanisms, namely process and outcome control (Jaworski, Stathakopoulos and Krishnan, 1993) may be leveraged to mitigate transaction risks and minimize the possibility of opportunistic behavior (Heide, Wathne and Rokkan, 2007; Poppo and Zenger, 2002 ; Williamburg and Schaffler, 2014) in supplier-specific investment efforts.

Contractual commitments and official organizational structures for collaboration that specify the roles and responsibilities as well as the processes and outputs that are regularly monitored make up formal control (Li, Xie, Teo and Peng, 2010). Process control refers to monitoring and evaluating supplier's behavior and processes (Nakos and Brouthers, 2008). The extant formal control literature pertinent to buyer-supplier relationships suggests that process control, by allowing buyers to monitor processes minimizes supplier opportunism and/or misbehavior ascertaining supplier allocation of valuable resources (Bello and Gilliland, 1997; Das and Rahman, 2001). The other type of formal control, namely output control refers to a more laissez-faire type of control, which focuses only on results rather

than supplier behaviors and/or processes (Murray, Kotabe and Gao, 2011). While, outcome control appears to provide more freedom to the supplier that the buyer invests in, not being constantly watched signals greater confidence in the abilities and intentions of the supplier, reducing the risk of opportunism and/or misbehavior (Kale, Singh and Perlmutter, 2000).

In light of this, we add to the relevant literature by filling two gaps. While the literature establishes the positive direct relationship between supplier-specific investment and firm-level performance, little is known about the formal control mechanisms play in the said relationship. Accordingly, by concurrently drawing from relational view and TCE we first examine the role that output control plays in supplier-specific investment – new product performance relationship. Second, we concurrently examine whether process control enhances the supplier-specific investment – new product performance relationship. In addition, we provide empirical evidence of the best possible levels of process/output control for higher new product performance for firms that engage in supplier-specific investment. To that end, we use a dyadic survey data of a total of 250 SMEs. To capture both the manufacturer's and the supplier's perspectives, we used dyads that consist of 125 manufacturer and 125 main suppliers of those manufacturers. In a nutshell, the aim of our study is to provide SMEs a managerial toolbox that may assist them in ascertaining new product performance when they engage in supplier-specific investment.

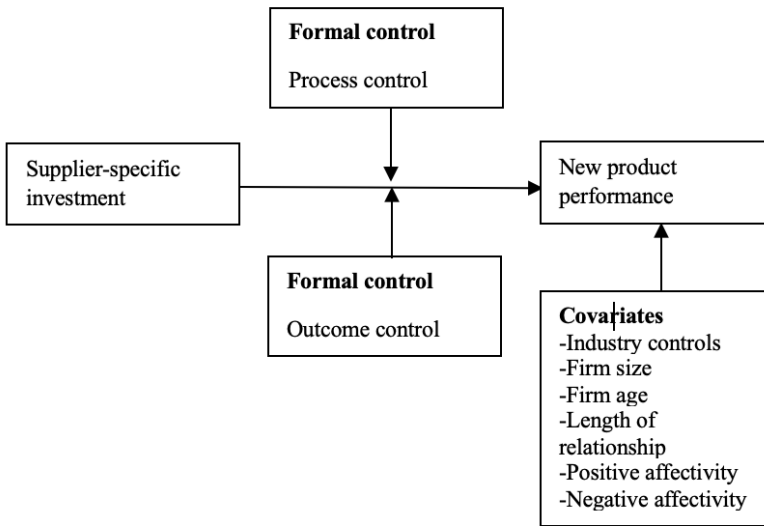
## **2. Theoretical framework: Relational view and transaction cost economics**

The relational view proposes that dyads and networks create firm heterogeneity through inter-firm value creation and relational rents in alliances (Dyer and Singh, 1998). The term relational rents describes the difference between the value produced by a certain alliance and the value produced by the alliance or market connection that is the next closest competitor. Hence, competitive advantage also exists when a relational rent does (Dyer, Singh and Hesterly, 2018). The relational view suggests that complementary resources and capabilities, relation-specific assets, knowledge-sharing routines, and effective governance are the primary factors that contribute to relational rents. Trading partners can increase productivity in the value chain by making relation-specific investments and combining resources in novel ways (Asanuma, 1989; Dyer, 1996). This suggests that buyer-supplier dyads that bundle resources creatively may gain an edge over rival companies that can't or are reluctant to take this step (Asanuma, 1989; Ndubisi et al., 2020). Accordingly, in this study, we focus on relation-specific assets and examine whether SSIs lead to rents in the form of new product performance.

The theoretical explanation of TCE examines and explains the structure of interactions between participants in an alliance (Nyaga, Whipple and Lynch, 2010; Williamson, 1975, 1985). TCE puts forward formal control as a mechanism that may restrict opportunistic behavior of alliance partners (Heide et al., 2007;

Dekker, 2004). Specifically, TCE suggests that process and output controls (Jaworski et al., 1993) may play an important role in opportunism minimization (Wallenburg and Schaffler, 2014). Considering that SSIs do not necessarily equate to access to supplier resources as we argued earlier, we believe that the use of process and outcome control may impact buyer relational rent obtainment.

Previous studies argue that SMEs lack financial means and focused organizational assets (Quayle, 2001; Ramsey, 2001) and only have small purchasing volumes (Adams, Khoja and Kauffman, 2012; Yenziaras, Di Benedetto and Dayan, 2021). In that vein SMEs may find themselves in an asymmetric relationship in terms of bargaining power and struggle with a lack of negotiating power with suppliers when trying get access to unequally distributed supplier resources. In addition, extant literature argues that SSIs may still be beneficial for SMEs in ascertaining relational rent with suppliers (Adams e al., 2021; Krajewski, Wei and Tang, 2005). Accordingly, we investigate whether process and outcome controls have dissimilar effects on the relationship between SSI and new product performance. The conceptual framework is shown in Figure 1 below.



**Figure 1.** Conceptual framework

### 3. Hypotheses

Due to its information and resource requirements, the process of developing new products incorporates both a web of multi inter-firm procedures and a network of intra-firm activities (Mele, Spena, and Colurcio, 2010). Such requirement makes it necessary for manufacturers to work closely with suppliers (Petersen, Handfield, and Ragatz, 2003). Working closely with suppliers transforms the reconfiguration of inter-organizational approaches, procedures, and actions into synchronized

collaborations to create value that otherwise might not be conceivable (He, Lai, Sun, and Chen, 2014; Jayaram and Tan, 2010). Under such conditions, manufacturers may decide to take part in unique investments that are specialized in their connection with their suppliers in order to enhance the performance of new products. These supplier- or relationship-specific investments, which are hard to recoup (Ganesan, 1994), are dedicated solely to a single provider and do not add much value outside of that particular relationship (Bensaou and Anderson, 1999). These investments show commitment and a desire to maintain a long-term partnership, which motivates the supplier to commit to the alliance and return the buyer's investment because it might prompt the supplier to give the investor manufacturer precedence over other clients (Mesquita, Anand and Brush, 2008). Whilst SSIs may enable manufacturers to access supplier resources that they would not be able to access otherwise, they also ensure performance benefits, which may lay the foundation of new product performance (Dyer and Hatch, 2006; Ghosh and John, 1999; Pulles et al., 2022).

Nevertheless, the extant literature underlines a possible dark-side of the coin when it comes to SSIs. SSIs present an intrinsic conundrum since they may both encourage or reduce supplier opportunism and resource allocation decisions (e.g., Rokkan, Heide and Wathne, 2003). SSIs may also lead to value-claiming challenges (Ghosh and John, 1999). Accordingly, the key research question is whether the supplier (e.g., the recipient in the relationship) will use the potential for expropriation through opportunistic behavior and limit the resources it puts in the buyer-seller relationship. TCE suggests that opportunism is likely to occur when such behavior is economical for a party (Gundlach, Achrol and Mentzer, 1995; Hill, 1990), whilst a separate stream of research accentuates the performance benefits of SSI. These contradictory theoretical assertions about SSIs point towards a theoretical hiatus in the SSI – performance relationship where they may exist possible intervening variables. Accordingly, drawing from TCE, we argue that the manufacturer choice of formal control mechanisms in the form process and outcome control may create differences in SSI – performance relationship.

### **3.1. SSI – New product performance relationship: the moderating effect of process control**

In buyer-supplier relationships (i.e., manufacturer-supplier relationship), quantifiable performance goals are set by the controller (i.e., manufacturer controlling supplier) via outcome controls, and the amount to which controlee (i.e., supplier) meets these goals determines how much the supplier is rewarded (Turner and Makhija, 2006; Sihag and Rijdsdijk, 2019). Because outcome control does not necessitate close observation of the supplier behavior, manufacturers can save time and money, controlling their partners (Kreutzer, Walter and Cardinal, 2015). That is because, the manufacturers are not obligated to comprehend how inputs are converted into products in order to successfully use outcome control (Ouchi, 1979). In addition because outcome control exemplifies a hands-off strategy for

overseeing the supplier, it delegates task execution the supplier that is actually carrying the actual work (Rijsdijk and van den Ende, 2011), relaxing the resource constraints that SME manufacturers may face. As a result, outcome control produces goals that are clear and detailed, resulting in a shared understanding of project goals among all relevant parties (Turner and Makhija, 2006). Furthermore, exercising outcome control does not only result in a greater supplier autonomy, independence task autonomy (Atuahene-Gima and Li, 2006) but also gives suppliers discretion over their behavior. This, in turn, increases supplier's sense of commitment and participation (Snell, 1992). Thus, the suppliers become motivated since outcome control enhances freedom to choose how they want to reach the predetermined relational objectives (Kreutzer et al., 2015).

Outcome control also ensures minimization of conflict and speculation between the manufacturer and supplier since the manufacturer can assess the work done by the supplier and provide them with the feedback so that they can accommodate modifications or further advancements (Carbonell and Rodriguez-Escudero, 2013). As a result, outcome control allows the suppliers to effectively fulfil manufacturer's requests (Sihag and Rijsdik, 2019). In that vein, the extant literature underlines the positive product performance consequence of outcome control (Lewis, Welsh, and Dehler, 2002; Lukas and Menon, 2004). Recall that SSIs carry an inherent paradox. Suppliers may perceive SSIs as signals of commitment and manufacturer's willingness to maintain a long-term partnership. Therefore, they become more willing to prioritize the investing manufacturer over the others (Mesquita et al., 2008). Nevertheless, opportunism may still occur when such behavior is economical for the supplier (Gundlach, Achrol and Mentzer, 1995; Hill, 1990), considering that SMEs have limited financial resources and purchasing power (Quayle, 2001; Ramsey, 2001 et al., 2003). We believe that outcome control may minimize the possibility of such an occurrence and hypothesize the following:

*H<sub>1</sub>: Outcome control positively moderates the relationship between SSIs and new product performance.*

### **3.2. SSI – New product performance relationship: the moderating effect of outcome control**

Recall that this study previously made the case about SSIs causing lock-in effects and increasing supplier's bargaining power within the manufacturer-supplier relationship. Such possible negative consequences of SSIs may cause the supplier to allocate less significant resources to the investing manufacturer and share these resources to rival accounts (Casciaro and Piskorski, 2005). Considering that the manufacturer's motivation behind SSIs is to establish competitive advantage by increasing new product performance (Pulles et al., 2023), the literature recommends manufacturers to use formal control mechanisms to mitigate potential negative consequences (e.g., Poppo and Zenger, 2002; Williamburg and Schaffler, 2014). Process control, which refers to the observation and assessment of supplier



behaviour and operations (Nakos and Brouters, 2008) may cause adverse consequences in new product development. That is because process control, which is far from ideal in product development projects may be unsuitable and lead to counterproductivity in innovative and technical projects in today's markets that are becoming more dynamic and uncertain (Bonner, Ruekert and Walker, 2002).

Process control improves the rigor, thoroughness, and attention applied to the creation of novel products (Lukas and Menon, 2004). In addition, process control ensures that the processes and key tasks are undertaken by the supplier in accordance with the agreed-upon arrangement (Tatikonda and Montoya-Weiss, 2001). Also, process control is argued to be a mechanism that helps coordination and communication between the manufacturer that engages in SSIs and the supplier (Carbonell and Rodriguez-Escudero, 2016). Nevertheless, a strict reliance on process control may result in a rigid, bureaucratic relationship where every process and activity are built into the development course increasing not only development times but also the costs (Carbonell and Rodriguez-Escudero, 2016; Cooper, 2011). That is because process control makes it obligatory to adjust to unforeseen circumstances which are probable throughout the creation of new products. In addition, it is well recognized that such processes frequently result in overzealous scheduling, evaluating, and decision-making (Kessler and Chakrabarti, 1996). As such, we believe that when manufacturers combine their SSIs with process control, new product performance may decline. Accordingly, we hypothesize the following:

*H<sub>2</sub>: Process control negatively moderates the relationship between SSIs and new product performance.*

## **4. Method**

### **4.1. Sample**

We employed a dyadic inquiry method to analyze the conceptual model (shown in Figure 1) and to include the viewpoints of both the manufacturer and the supplier. We administered the surveys to one product manager from the primary supplier and one logistics manager from a manufacturing company form a dyad that is matched by a number code in the relevant survey. Firstly, we selected 3,420 manufacturing SMEs in Turkey at random from a list of manufacturers compiled by the Union of Chambers and Commodities Exchanges of Turkey in order to gather this matched, multi-source, and multi-respondent data set. Every SMEs in the country mentioned on the list had their phone numbers and email addresses listed. Second, 132 out of the 842 manufacturing companies we approached agreed to take part in our research. Third, we invited the manufacturing companies that chose to name their primary suppliers, and we requested those suppliers to participate in our study to avoid any potential single-source bias issues. As a result, we were able to create 125 pairs of manufacturing companies and their primary suppliers. On May 24, 2018, the American University of Sharjah's internal review board gave its

approval for the data gathering, which was given the document number EFRG18-AAB-SBA-80<sup>5</sup>.

The enterprises ranged in size from 25 to 250 full-time workers, with a mean of 60. Out of 125 suppliers, 50 provided components and materials for consumer goods, while 75 provided parts and supplies for industrial items. With the youngest supplier being operational for one year and the oldest being 20 years old, the mean supplier age was about 12 years. Also, the suppliers collaborated with a mean of 9 manufacturers, ranging from 5 to 15. The number of items the manufacturer-supplier dyads worked on mean was 14, with a high of 21 and a low of 1. Table 1 below provides the details.

**Table 1.** Correlations and Summary Statistics

	AVE/CR scores	Reliability of multi-item scales (Cronbach alpha)	Mean	Std	Size	Age	Length	Industry1	Industry2	Paf-fect	Naf-fect	Out-putc	Pro-cessc	SSI
Size	-	-	1.96	1.45	1.00									
Age	-	-	3.38	1.52	.34**	1.00								
Length	-	-	3.24	1.32	.08	.30**	1.00							
Industry1	-	-	.60	.49	.09	-.07	.191*	1.00						
Industry2	-	-	.06	.24	-.06	-.02	-.05	-.32	1.00					
Paf-fect	.58/.79	.67	3.25	.94	.06	-.05	-.08	.11	.12	1.00				
Naf-fect	.70/.88	.78	2.82	1.14	-.06	.03	.11	.05	.05	.05	1.00			
Outputc	.58/.80	.63	4.32	.70	-.10	.01	-.11	.12	.01	-.08	.09	1.00		
Processc	.69/.90	.84	4.23	.90	-.05	.04	-.14	-.01	.03	-.05	.02	.74**	1.00	
SSI	.62/.87	.73	3.46	.93	-.04	-.05	-.05	.12	-.16	-.09	-.05	.36**	.41**	1.00
NPP	.55/.86	.72	3.66	.86	-.09	-.03	.06	-.04	-.06	-.05	.04	.36**	.52**	.43**

\*\* Correlation is significant at the  $p < 0.01$  level (2-tailed).

\* Correlation is significant at the  $p < 0.05$  level (2-tailed).

Notes: size- firm size; age- firm age; Industry1&2- industry controls; Paf-fect- positive affectivity; Naf-fect- negative affectivity; Outputc- output control; Processc- process control; SSI- supplier specific investment; NPP- new product performance

A native Turkish speaker who is also a proficient English speaker translated the questionnaires from English to Turkish. A second multilingual expert then translated the questionnaire into English. We then made the necessary changes based on earlier domain study (Yeniaras, 2023). Firstly, as part of the pre-tests, we asked nine randomly chosen professionals to evaluate the content and significance

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of the survey questions. In order to confirm the suitability of the scale objects utilized in our inquiry, we then spoke with four experts in pertinent domains. In response to suggestions from practitioners as well as scholars, we revised the items.

## 5. Measures

We used scales that had previously been used in the pertinent literature in this investigation. We used a five-point Likert scale to evaluate each measure. We gauged new product performance by having participants evaluate their company's new product performance over the previous three years in terms of sales, market share, profitability, and ROI to that of their top competitors (1=much worse and 5=much better) (Joshi and Sharma, 2004; Yeniaras and Unver, 2016). To measure process control, which refers to monitoring partner behavior to direct it toward specific goals and objectives (Nakos and Brouthers, 2008), we used Jaworski and MacInnis' (1989) 4-item process control scale. Similarly, output control – the second control mechanism which focuses on the results were measured by Jaworski and MacInnis' (1989) 4-item output control scale. Buyer-specific investment refers to investments, which are difficult to be diverted towards another relationship without a loss in value, made by the buyer in support of a given supplier (Rokkan, Heide, and Wathne, 2003). To assess buyer-specific investment, we adapted a 4-item scale from Rokkan et al., (2003).

### 5.1. Control variables

The effectiveness of new products and new product performance have been shown to be correlated with a variety of organizational variables, including firm size, firm age, the quantity of co-manufactured products, and industry effects. To address it, we controlled new product performance for firm size, firm age, length of buyer-supplier relationship, industry effects, and negative and positive affect. The inclusion of these controls into the model allowed us to reduce any potential presence of diseconomies and/or economies of scale (Bain, 1968), industry/size (Lee, 2006) and social desirability effects.

### 5.2. Measurement model

This study assesses the reliability and validity of the hypothesized model via the use confirmatory factor analysis (henceforth, CFA). The results that we obtained did not necessitate the deletion of any items of multi-item constructs due to low factor loadings (<.40). CFA provided evidence of acceptable fit for the sample [(Minimum Discrepancy Function/degrees of freedom (CMIN/DF) = 1.26, goodness of fit index (GFI)= .85, comparative fit index (CFI)= .95, root mean square error of approximation (RMSEA)= .46, PCLOSE= .646]. Additionally, we assessed convergent validity via the calculation of composite reliability (CR>.60) and average variance extracted (AVE>.40) scores. The square of the intercorrelations between two constructs was smaller than the AVE estimates of

the same pair (Fornell and Larcker, 1981). This provided evidence of discriminant validity. Reliability and validity scores may be seen in Table 1.

### 5.3. Method of analysis

To test the web of relationships illustrated in Figure 1., we used a moderated hierarchical regression analysis. We mean-centered the variables that define moderation (i.e., buyer-specific investment x process control; buyer-specific investment x outcome control) to lessen the risk of multicollinearity (Aiken and West, 1991). To assess collinearity for regression coefficients, we analyzed the variance inflation factor. Further, to estimate the relationship between buyer-specific investment and new product performance at low, medium and high levels of process and outcome control (i.e., conditional moderated effects) we used Preacher and Hayes' (2004) bootstrapping method. The use of this method let us minimize the power problems, which may be caused by asymmetries and nonnormality in the sample distribution (Shrout and Bolger, 2002) as it does not make any assumptions regarding the shape of distribution of the variables (Efron and Tibshirani, 1994).

## 6. Results

Table 2 provides empirical evidence of the direct relations of buyer-specific investment, output control and process control to new product performance. Additionally, Table 2 shows evidence of the moderated relationships. An initial examination reveals that buyer-specific investment was directly and positively related to new product performance ( $b=.222$ ;  $SE=.078$ ;  $p<.01$ ). Similarly, we found that process control directly and positively related to new product performance ( $b=.589$ ;  $SE=.129$ ;  $p<.01$ ). Conversely, we found that the direct relationship between output control and new product performance was negative and insignificant ( $b=-.174$ ;  $SE=.148$ ;  $p>.05$ ).

Next, we visited the hypothesized moderated relationships. Recall that in H1 we hypothesized that outcome control would negatively moderate the relationship between buyer-specific investment and new product performance. The results provided empirical evidence to suggest that output control, in fact, negatively moderates the aforementioned relationship as hypothesized, seen in Table 2, model 4 ( $b= -.331$ ;  $SE=.166$ ;  $p<.05$ ). This provided evidence to suggest that while, buyer-specific investment is positively related with new product performance, the implementation of output control reverses the said relationship. Conversely, we found that process control, which refers to monitoring partner behavior to direct it toward specific goals and objectives (Nakos and Brouthers, 2008), negatively moderated the relationship between buyer-specific investment and new product performance ( $b=.251$ ;  $SE=.123$ ;  $p<.05$ ).

**Table 2.** Hypothesis Testing

Dependent variable:	Model 1		Model 2		Model 3		Model 4	
	b	SE	b	SE	b	SE	b	SE
<b>New product performance</b>								
<i>Constant</i>	3.722**	.417	3.515**	.377	3.346**	.341	3.414**	.339
<b><i>Control variables</i></b>								
Firm size	-.045	.058	-.035	.053	-.016	.048	-.027	.048
Firm age	-.021	.059	-.017	.053	-.047	.048	-.048	.048
Length of relationship	.057	.065	.076	.059	.133*	.054	.124*	.054
Industry control 1	-.133	.179	-.214	.162	-.236	.148	-.179	.150
Industry control 2	-.293	.344	-.108	.312	-.272	.283	-.239	.289
Positive affectivity	-.018	.086	.016	.077	.038	.070	.028	.070
Negative affectivity	.025	.070	.038	.063	.034	.057	.026	.057
<b><i>Main effects</i></b>								
Buyer-specific investment (BSI)			.409**	.077	.222**	.078	.209**	.077
<b><i>Moderators</i></b>								
Output control (OC)					-.110	.146	-.174	.148
Process control (PC)					.523**	.123	.589**	.129
<b><i>Interaction effects</i></b>								
BSIxOC							-.331**	.166
BSIxPC							.251*	.123
R <sup>2</sup>	.023		.215		.375		.400	
F-model	.393		3.939 **		6.791**		6.161**	
ΔR <sup>2</sup>	-		.192		.160		.025	

\*\* . Correlation is significant at the p<0.01 level (2-tailed).

\* . Correlation is significant at the p<0.05 level (2-tailed).

Next, we more closely scrutinized the moderation effects of output and process controls on the relationship between buyer-specific investment and new product performance. With that regard, we examined the conditional moderated effects. To do that, we examined the relationship between buyer-specific investment and new product performance at low, medium and high levels of both output and process control. To calculate the thresholds, we first mean centered both control mechanisms and added and subtracted one standard deviation from each. The results showed us that the relationship is at its highest at low levels of output control and high levels of process control. Conversely, we found that the relationship between buyer-specific investment and new product performance is at its lowest when both process and output controls are at their highest. The results are shown in Table 3 below.

**Table 3.** Conditional effects of buyer-specific investment to new product performance at low, medium and high levels of output control and process control

Output control levels	Process control levels	Effect	SE	p-value
-.7089	-.8669	.2308	.1012	p<.05
-.7089	.0000	.4486	.1368	p<.01
-.7089	.7440	.6355	.2097	p<.01
.0000	-.8669	-.0035	.1337	p>.05
.0000	.0000	.2143	.0773	p<.01
.0000	.7440	.4012	.1173	p<.01
.6694	-.8669	-.2247	.2247	p>.05
.6684	.0000	-.0070	.1391	p>.05
.6694	.7440	.1799	.1032	p<.05

## 7. Discussion and conclusions

This study examines the moderating effect of the twin formal control mechanisms, namely process and output control on the relationship between manufacturer's supplier specific investment on new product performance. Recall that SSIs are hard-to-recoup and/or move investments, which focus on specific suppliers. Manufacturers mostly leverage SSIs to incentivize the suppliers to be prioritized by them in resource allocation. While the extant literature mostly suggest that SSIs equate to increased firm-level performance (e.g., Kim and Choi, 2019; Pulles et al., 2023), a separate stream of research points towards a possible dark-side where the suppliers do not deliver their best resources. That is because small-medium sized manufacturers especially, generally lack bargaining power due to smaller purchase volumes (Dyer, Singh and Hesterly, 2018). The consequences of such lack of resources may encourage suppliers to engage in opportunistic action and distribute their resources to competing accounts without fear of negative consequences (Casciaro and Pskorski, 2005).

## 7.1. Theoretical implications

This study makes important contributions to the extant literature and has notable theoretical implications. The first contribution of our study lies in the empirical evidence that shows positive relationship between supplier-specific investment and new product performance. This finding adds to the extant literature that underlines the firm-level benefits of the use of SSIs (e.g., Dyer and Hatch, 2006; Hunt and Davis, 2008; Kim and Choi, 2018; Pulles et al., 2023) and link SSIs to new product performance. Recall that, our conceptual model simultaneously draws from the relational view and TCE literature and makes two additional notable contributions. First, we make the case that to minimize the threat of opportunistic action and ascertain access to valuable supplier resources, manufacturers may resort to the use of formal controls. In that vein, we draw from TCE (Williamson, 1979), which suggests that given the right circumstances all exchange parties may engage in opportunistic action. We argue that the use of process and output control may not always equate to increased new product performance.

Secondly, our finding adds to both relational view and TCE literatures and suggests that output control results in enhanced new product performance levels for manufacturing SMEs that invest in specific suppliers. This adds to the extant literature, which argues that output control has positive performance benefits (e.g., Lewis, Welsh, and Dehler, 2002; Lukas and Menon, 2004) and indicates that output control contributes to new product performance of manufacturing SMEs that engage in SSIs. Contrarily, we find that process control negatively moderates the relationship between SSIs and new product performance as hypothesized. This shows that a heavy dependence on process control could lengthen development times and increase expenses of manufacturing SMEs (Carbonell and Rodriguez-Escudero, 2016; Cooper, 2011). This finding is important in itself since it clarifies the mixed findings on formal control – new product performance relationship with some findings suggesting negative (e.g., Bonner et al., 2002), positive (e.g., Tatkionda and Montoya-Weiss, 2001) and nonsignificant (e.g., Rijdsdijk and van den Ende, 2011) relationships.

## 7.2. Managerial implications

We previously established that new product development is a critical performance indicator of effective strategies in emerging markets because the effects of new products on firm performance are substantially larger in developing markets than in developed nations (e.g., Bahadir et al., 2015; Srovastava, 2018). While the importance of product development is well recognized, emerging-economy SMEs find themselves in a conundrum where they cannot engage in new product development due to lack of internal and/or external access to equity capital (e.g., Yeniaras, Kaya, and Dayan, 2020; Yeniaras, 2023). This resource restriction challenge forces emerging-economy SMEs to upstream facing activities (Dong and Sivakumar, 2017) centered in co-production of value offerings (Kathuria,

Karhade, and Konsynski, 2020) through leveraging relational rents with suppliers (Dyer and Singh, 1998). Nevertheless, suppliers favor some customers above others while also unequally allocating these resources and expertise across their customers (Mitsuashi and Greeve. 2009; Wang et al., 2013), which may be damaging to new product development efforts.

Our study produces a managerial toolbox to managers working for emerging economy SMEs that decide to allocate already restricted resources to investment in support of a given supplier (Rokkan, Heide, and Wathne, 2003) in attempt to enhance new product performance. Our results show that these managers must monitor and evaluating supplier's behavior and processes (Nakos and Brouthers, 2008) rather than focusing only on results (Murray, Kotabe and Gao, 2011) to increase new product performance. Recall that supplier-specific investments are difficult to be diverted towards another relationship without a loss in value (Rokkan et al., 2003) and resource restriction problem of emerging-economy SMEs. Accordingly, we advise managers to choose process control to ascertain obtaining the best resources from suppliers. This managerial implication is particularly important since the bargaining power in manufacturer-supplier relationship may be tilted towards suppliers considering the resource restrictions of emerging-economy SMEs. Accordingly, process control may enable firms to engage in supplier-specific investments without the fear of negative consequences (Casciaro and Piskorski, 2005). In a nutshell, this study makes the managerial recommendation of relying on output control to manufacturing SMEs that engage in SSIs to enhance new product performance. Simultaneously, we would urge the management of SME manufacturers to not to depend on process control if they were to aim enhanced new product performance via the use of SSIs.

## **8. Limitations**

Because of its numerous limitations, the study's conclusions must be assessed and taken with care. First, the moderating effects of output and process control on the SSIs – new product performance relationship may be lagged. The cross-sectional nature of the data employed in this study prevents us to test a possible lagged effect. Second, the use of objective performance metrics could increase the validity of the evidence. Nevertheless, the new product performance that we use in this study is a subjective, self-report measure. Another problem is non-response bias. Due to a lack of resources, we were unable to follow up with employees who did not respond straight away. Yet, our study provides opportunities for future research to re-test and improve our findings.



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