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Innovating for competitive advantage: managerial risk-taking ability counterbalances management controls

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Abstract

The study applies dynamic capability theory to investigate the combined impact of the two mediators management controls and managerial risk taking in the relationship between innovative capability and competitive advantage. The study was conducted during 2016–2017 using a partial least squares–structural equation modeling technique with a sample of 165 professional managers in the highly competitive Indian information technology industry which is global in its reach and has its competitive strength in its innovations. The study found that the ability to innovate had a direct impact on firms' competitive advantage. When both the mediators were considered together, they counterbalanced one another. We thus theorize that managerial risk-taking ability mitigates the impact of managerial controls. This finding has significant ramifications for organizations' operational and strategic choices. The study contributes to the strategic management literature by validating dynamic capability theory in an emerging market context. From a methods perspective, this study illustrates the application of a multiple mediation methodology in the context of a dynamic capability theory framework.

Keywords Competitive advantage · Dynamic capabilities · Innovative capability · Management controls · Risk taking

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1 Introduction

Does the risk-taking ability of individual managers counterbalance the impact of management controls on a firm's ability to generate competitive advantage? It appears that managers with excess risk aversion can inhibit innovation (Power 2007), but what of managers who thrive on risk taking? Selznick (2011) suggested that both management controls and risk taking are very much required (Golant et al. 2015). It is also relevant to note that not all controls inhibit innovation in all contexts (Davila et al. 2009), and not all risks lead to rewards.

The impact of management controls in knowledge-based firms remains unexplored. Too many controls stifle innovation (Batt 2002), and too few controls cause a firm to deviate from its goals (Bisbe and Otley 2004). Prior studies have highlighted that management control tended to reduce innovation (Berry et al. 2005), reduce trust in management (Collins and Smith 2006), lead to higher turnover (Batt 2002), and reduce engagement (Schuler and Jackson 1987). However, there is a paradox here. Effective innovation frequently has its genesis in a new idea developed through a controlled process (Choi and Chang 2009; Anderson et al. 2014), requiring both organizational risk taking and management controls.

It is interesting to observe that leaders' appreciation of transformation processes holds the key to the success of organizational controls (Rockness and Shields 1984). Not all controls are counterproductive. Ditillo (2012) argued that, in knowledge-intensive industries, controls of a certain type can lead to better knowledge transfer. Controls are also needed to save creative employees who were not successful in their ventures (Zhou and George 2001). Finally, controls have been found to help firms avoid innovations that do not fit with the firm's strategic agenda (Bisbe and Otley 2004) and to help curb innovative excess (Miller and Friesen 1982). Thus, management controls have a significant role in helping organizations achieve their business goals.

The Indian information technology (IT) industry is global in its reach and has its competitive strength in its innovations. Previous studies in the context of emerging market firms have improved our understanding of the interplay between controls, ownership, business growth and competitiveness. For instance, Singh et al. (2018) examined the process of the emerging market firm's pursuit of growth agendas during pro-market reforms. Malhotra and Gaur (2014) studied firms' choices of control in cross-border acquisitions, Gaur and Lu (2007) integrated institutional theory with organizational learning, and Gaur et al. (2007) found that firms rely on expatriate mangers to efficiently transfer management practices to distant environments.

The impact of ownership and governance on research and development (R&D) and innovation is also well researched. For instance, Contractor et al. (2016) studied the impact of ownership strategy in the relationship between parent company intangibles and foreign affiliate performance. Gaur and Delios (2015) found that ownership concentration influences the firm internationalization process. Lee et al. (2017) probed the impact of the share of business groups in industry on the industry's R&D intensity and Singh and Gaur (2013) argued that governance

affects firm-level innovation in the emerging market firms. Thus, the interplay of managerial risk-taking ability on management controls and the subsequent firm choices, is an area indicated for further research.

The Indian IT industry provided an appropriate setting for this study. In knowledge-intensive businesses around the world, the disruptive innovation of rivals challenges leaders in high-profile sectors (Christensen et al. 2004; Chesbrough 2006). The Indian IT industry follows this trend and allowed us to address issues of innovation in an emerging market context. Merchant and Gaur (2008) suggested studying the non-manufacturing sector, which includes the IT services sector, hence its choice for this study. The IT managers of leading Indian multinational firms, across seven major Indian cities, were administered a questionnaire during 2016–2017. We found that the impact of managerial controls is counterbalanced by managerial risk-taking ability.

The study makes three distinct contributions. First, we explored whether innovative capability leads to a competitive advantage in knowledge-based firms. Dynamic capability (DC) theory was employed in the setting of the Indian IT industry. DC theory is based on the premise that firms should have the ability to reconfigure their resources to fit with their environment and to use these competencies to benefit the firm (Helfat and Peteraf 2009). Multinational enterprises attempt to maximize transaction values (Hwang and Gaur 2009), which indicates the development of DC. Schotter et al. (2017) opined that complex global organizations (such as large IT firms) have subunits that are influenced by the host country context more than the firms' country of origin; such a phenomenon of situational learning hints at the development of DCs in such firms. Thus, DC theory makes a strong case for probing whether innovative capability (an integral part of a firm's DC) leads to competitive advantage.

Second, we explored whether highly risk-taking managers could provide their firms with a competitive advantage over the firm's peers, even when the concerned firm was subject to an elevated level of control. Firms require a specific combination of resources to innovate (Schumpeter 1934), but how these innovative efforts fare in a highly controlled environment was unknown. Deeper knowledge in this area could have ramifications in human resource planning processes, such as in managerial hiring, incentive design, and executive compensation, in addition to organizational structure decisions.

Finally, with the help of a multiple mediation model, the combined effect of both the mediators was simultaneously established. This is, to our knowledge, the first study to test DC theory at a managerial level. DC theory establishes the capabilities, the routines, and the processes that lead firms to long-term competitive advantage. Earlier studies, such as that by Gaur et al. (2014), have highlighted that the firms that make the most of their unique institutional advantages make steady progress in their internationalization processes. Further, Popli et al. (2017) argued that firms that use their affiliations to attain superior long-term acquisition performance. This study is an attempt to contribute further knowledge in this direction. The present study considers managers in senior decision-making roles and with formal organizational authority as influencers over their firm's

DCs. This methodological choice is relevant to managerial strategy and managerial control in the context of lean IT firms.

2 Conceptual development and hypothesis

According to DC theory, sustainable competitive advantage is created when firms innovate with their at-hand resources and, while doing so, benefit from the dynamism in the environment (Teece et al. 1997). Innovative capability is a strategic intangible resource that should lead to a sustained competitive advantage ("by a resource is meant anything which could be thought of as a strength or weakness of a given firm" Wernerfelt 1984, p. 172). DCs help the firm sustain a "better than peer" performance over time. The capability to achieve superior firm performance through innovation is contextually more relevant for our study than the resource-based view (RBV), which suggests that resources, when they are valuable, rare, imitable, and non-substitutable, will lead to sustained competitive advantage (Barney 1991).

2.1 The relationship between innovative capability and competitive advantage

A firm's ability to innovate is associated with the firm's achievement of sustainable competitive advantage (Nelson and Winter 2002; Teece et al. 1997; Baer 2012). Innovative capability, which is the firm's ability to generate and use new ideas, products, or services, leads to a firm's market success (Calantone, Cavusgil and Zhao 2002; Ngo and O'cass 2013) and is therefore of great significance. Innovation has a direct effect on a firm's competiveness (Mintzberg 1994), and firms that do not innovate are rendered less competitive (Ferauge 2012). Per the RBV, innovative capability is the deployment of resources to improve productivity and achieve strategic goals (Makadok 2001), and organizational innovation (here considered as a capability) is a source of competitive advantage (Goldman et al. 1995).

The overarching question is, what kind of innovation matters for creating a competitive advantage over peers? Past studies have suggested that firms that build on their prior learnings and technical competencies are more suited for product diversification and international expansion (Kumar et al. 2012), both of which lead to competitive advantage. Additionally, as Gaur and Kumar (2009) asserted, firm performance is positively related to the degree of internationalization of the firm. Singh et al. (2010) highlighted that product diversification and geographical diversification complement each other in enhancing the firm's performance. Further, it is interesting to note that the domain of administrative, organizational, and management innovations overlap (Damanpour and Aravind 2012) however for the study we considered organizational innovation. Some studies have also shown the complementary nature of organizational innovation and technological innovation (Piva et al. 2005; Damanpour et al. 2009; Martínez-Ros and Labeaga 2009; Battisti and Stoneman 2010).

The setting of Indian IT firms was found to be appropriate since, with the increasing complexity and competiveness in the business environment, innovation was a

must for firms hoping to achieve continuing growth. This is because firms that operate in highly competitive industries need to have sound business intelligence systems for business planning purposes (Gimeno and Woo 1996), which further lead to innovative solutions. Employee innovativeness is a must for promoting competitiveness in an environment of uncertainty (Van de Ven et al. 1999), which lead us to the hypothesis

H1 Innovative capability has a positive direct effect on the firm's competitive advantage.

2.2 The role of management controls in the relationship between innovative capability and competitive advantage

Innovation can be incremental or radical (Dewar and Dutton 1986). Incremental innovation, as the name suggests, is aimed at marginally improving the existing portfolio of products or services. Radical innovation requires a paradigm transformation in existing offerings (Dewar and Dutton 1986). It has been established in prior works that management controls inhibit the application of knowledge, in addition to having a demotivating impact on employees (Deci et al. 1989). Reduction in management controls thus leads to higher performance and commitment (Huselid 1995; Batt 2002). However, controls are not the only relevant factor. Management controls impact learning and attitude formation, depending on whether the knowledge involved is complete and available (Turner and Makhija 2006). Additionally, employee initiative sometimes leads to knowledge transfer in addition to or instead of formal relationships of authority and structures of responsibility (Allen et al. 2007). Singh and Gaur (2009) suggested that ownership concentration and the resultant controls have a positive effect on firm performance. Informal interactions among employees are of utmost significance when tacit knowledge is to be shared (Pittaway et al. 2004). These findings regarding knowledge transfer in innovative firms are relevant for the Indian IT industry due to its knowledge-intensive nature and its competitive global position, as innovative companies are constantly creating new knowledge (Nonaka and Takeuchi 1995).

Sustainable competitive advantage requires a renewal of resources and capabilities to innovate (Nelson and Sidney 1982; Eisenhardt and Martin 2000). Management control tended to reduce innovation (Berry et al. 2005), reduce trust in management (Collins and Smith 2006) and also lead to higher turnover (Batt 2002). Innovation, which entails identification and use of opportunities to create new products or services (Van de Ven 1986), is affected by the management controls exercised in firms (McGrath 2001). However, prior studies have also highlighted that not all controls inhibit innovation in all contexts (Davila et al. 2009), and a firm-level innovation agenda requires management controls to be effective. Effective innovation frequently has its genesis in a new idea that is developed by a controlled process (Choi and Chang 2009; Anderson et al. 2014). According to Hurley and Hult (1998), highly innovative firms engage in learning, experimenting, and risk taking. Such firms therefore need more controls to manage their innovation culture and to align

innovation with organizational goals. Moreover, controls of a certain type can lead to better knowledge transfer, leading to innovation. Thus, we hypothesize:

H2a Innovative capability has a positive effect on the firm's management controls.

H2b Management controls have a negative effect on the firm's competitive advantage.

2.3 The role of managerial risk-taking ability in the relationship between innovative capability and competitive advantage

According to DC theory, to have a competitive advantage, firms need to have certain resources and capabilities, such as the capability to innovate, along with the experience and skills to explore the best outcomes. Andersson et al. (2015) argued that corporate headquarters' understanding of risk-return trade off was a crucial factor affecting the utilization of resources. Innovation entails risk-taking at all organizational levels (Zahra 2005; Colquitt et al. 2007), for two main reasons. First, competitive advantage does not emerge from acquired knowledge itself, but is a function of how effectively the acquired knowledge is applied (Alavi and Leidner 2001), and the application of knowledge entails a certain degree of risk. During managerial decision-making situations, resources are allocated to activities that help a firm compete with its rivals (Hunt 2010). Second, a firm can develop its innovation capabilities, among other ways, by developing a learning culture (Marinova 2004) and by putting learning into practice, which requires undertaking a certain degree of risk. This leads us to the hypothesis:

H3a Innovative capability has a positive effect on managerial risk-taking ability.

H3b Managerial risk-taking ability has a positive effect on a firm's competitive advantage.

2.4 The combined impact of the two mediators, management controls and managerial risk-taking ability

The development of new services and products is at the heart of a firm's sustained performance (Zahra and Covin 1995; Covin and Miles 2007), presuming an ability to innovate. This innovative capability is largely influenced by how a firm puts to use external information to come out with new offerings (Cohen and Levinthal 1990). In this process, management controls and managerial risk-taking abilities play crucial roles (Anderson 2008), since there exists an inverse relationship between situational constraints (largely an impact of the prevalent controls) and creative work; constrained employees believe they have low control over their work (Binnewies and Wörnlein 2011). Simons (1990, p. 128) argued that "management control systems are the formalized procedures and systems that use information to maintain or alter patterns in organizational activity," and Simons (1990) also opined that control

systems could be used in the management of uncertainty, acknowledging the linkage between management controls and inherent environmental risks. Mukherjee et al. (2013) asserted that environmental uncertainty and knowledge intensity impede firms' R&D alliance formation which in turn has an impact on the firms innovation endeavours.

For an IT firm, competitive advantage is determined by multiple mediators acting collectively on the resources (see RBV) and the processes. Some of the mediators may have individual impacts, but, when combined with the impact of others, their impact may be increased or decreased. The broader perspective of the present study is whether managers with an inherent appetite for risk can mitigate the impact of management controls and still innovate, thereby leading the firm to a distinct competitive advantage. As García-Granero et al. (2015, p. 1094) highlighted, "Thinking outside the box entails a great deal of uncertainty, and bold decisions and actions are often necessary to achieve innovative results." Thus we hypothesize:

H4 Managerial risk taking and management controls mitigate each other's effects on the relationship between innovative capability and competitive advantage.

3 Methods

3.1 Data collection, research setting, and sample

The research hypotheses were tested in the Indian IT industry, across seven major Indian IT firms. The objective was to study a single industry in depth and to reduce the range of extraneous variations in the data, which could influence the measurement of constructs (Coombs et al. 1996; Santarelli and Piergiovanni 1996). These seven major IT firms were in cities that had cosmopolitan workforces, in turn representing to a large extent the diversity of India. A pretested (Chin 1998) and pilot-study validated (DeVellis 2016) questionnaire using a well-labeled 7-point manager self-rating Likert scale (to maximize variance) was administered to 280 managers. We obtained a sample of 185 responses, of which 20 were eliminated because they were incomplete. Our final sample thus consisted of 165 usable responses. This gave us a response rate of 58.9%, which was high (Marcoulides and Saunders 2006). The high response rate is attributable to our use of a hard copy questionnaire and our follow-up procedure, consisting of two follow-up contacts made with unresponsive target respondents. A minimum managerial experience of two years was a prerequisite to be included in the sample. A careful screening process ensured that the questionnaire was administered only to respondents who had the relevant authority for decision making in their respective firms.

The sample was collected with generalizability requirements in mind (Birnberg and Snodgrass 1988); hence we collected data from seven major Indian cities. The face validity of the questionnaire was established by taking the inputs of five academicians and three industry subject experts. The sample (Table 1) of 165 respondents was 19.3% female.

Table 1 Description of sample, $n = 165$

Variable	Values	%
Age	25–34	66.66
	35–44	33.33
Gender	Male	80.60
	Female	19.39
Educational background	Engineering graduates (B.E or B.Tech) and science graduates	87.87
	Engineering graduates and science graduates with a post-graduation degree or diploma	12.12
Managerial experience (including project manager, team leader, research and development scientist) in the information technology sector or information technology enabled services	Up to 6 years	78.78
	More than 6 years	21.21

To control for common method variance, the measures are based on different sources, as suggested by Podsakoff et al. (2003). The respondents were assured that the data collected would be used for research purposes only. Additionally, the sequence of questions was changed in some questionnaires. The respondents were assured beforehand that there was no single correct or incorrect answer, and that their responses were to be kept anonymous.

3.2 Statistical analysis

For data analysis, a partial least-square structured equation modeling (PLS-SEM) method was considered appropriate. PLS-SEM is a nonparametric second generation multivariate analysis technique that simultaneously measures the structural model and the measurement model (Lowry and Gaskin 2014; McIntosh et al. 2014). PLS-SEM was chosen because it does not have any assumption regarding the distribution of data. The study focuses on prediction and explanation of the target constructs for theory development, and PLS-SEM does not suffer from identification problems caused by small sample sizes. The Smart PLS package version 3 (Ringle et al. 2015) was used for the data analysis.

3.3 Measurement variables

All the constructs were operationalized by taking established scales from reputed prior studies. Then the validity and the reliability of the scales was established. Innovative capability was measured using a 6-item scale by Subramaniam and Youndt (2005). Competitive advantage was measured using a 6-item scale by Schilke (2014). Managerial risk-taking was measured with a 3-item scale by García-Granero et al. (2015), which was adapted from Covin and Slevin (1986). Management control was measured using a 3-item scale by Allen et al. (2015), which was

adapted from Turner and Makhija (2006). Turner and Makhija in turn adapted this scale from Hackman and Oldham (1980).

4 Results

The study followed a two-step approach (Ali and Park 2016) to analyze and interpret the PLS-SEM results by the assessment of (1) the measurement model and (2) the structural model.

4.1 Evaluation of measurement model

As shown in Table 2, the composite reliability (CR), a measure of internal consistency of the constructs, was greater than 0.7 for all the reflective constructs. The Cronbach's alpha (Nunnally 1978) was greater than 0.7 for all the reflective constructs. The outer loadings as a measure of indicator reliability were found to be greater than 0.7 and significant at the 95% level. For items CA_6, MC_18 and MR_9, the loadings were close to 0.7, and thus these items were retained. Items IC_13 and IC_15 were removed from the final version of the construct and were not

Table 2 Reliability and validity

Construct	Items	Factor loadings	CR	Cronbach alpha	Ave
Comp Advtg			0.900	0.870	0.601
	CA_1	0.787			
	CA_2	0.773			
	CA_3	0.857			
	CA_4	0.786			
	CA_5	0.744			
	CA_6	0.696			
Inno Cap			0.826	0.721	0.553
	IC_10	0.821			
	IC_11	0.837			
	IC_12	0.790			
	IC_14	0.462			
Mgmt Cont			0.819	0.667	0.604
	MC_16	0.857			
	MC_17	0.799			
	MC_18	0.661			
Mgr Risk Taking			0.761	0.531	0.516
	MR_7	0.728			
	MR_8	0.760			
	MR_9	0.665			

CR composite reliability, *Ave* average variance extracted

Table 3 Results of heterotrait monotrait ratio (HTMT) analysis

	Comp Advtg	Inno Cap	Mgr Risk Taking	Mgmt Cont
Comp Advtg				
Inno Cap	0.461			
Mgr Risk Taking	0.187	0.460		
Mgmt Cont	0.115	0.261	0.347	

included in the structural model. However, IC_14 was retained due to its theoretical relevance.

To ascertain convergent validity, the Average Variance Extracted (AVE) was calculated for the reflective constructs. The AVE was greater than 0.5 and significant at the 95% level. Discriminant validity was ascertained using the heterotrait monotrait (HTMT) ratio. The HTMT ratio is the stricter cross-loading criterion, compared with the Fornell and Larcker (1981) criterion. As shown in Table 3, the HTMT ratio (Henseler et al. 2015), was calculated to ascertain discriminant validity, and since the HTMT was well below 0.85, discriminant validity was established. Thus, the constructs were well measured, and the measurement model could be used for the overall structural model assessment.

4.2 Evaluation of structural model

After we confirmed that our construct measures were both reliable and valid, we also checked for collinearity before examining the structural model (Sarstedt et al. 2014). Since $r < 0.9$ in the empirical correlation matrix, there is no collinearity present in the data.

The path coefficients shown in Fig. 1 represent the estimated change in the endogenous construct for a unit change in the predictor construct. The PLS algorithm aims to reject a set of path-specific null hypotheses of no effect by minimizing the amount of unexplained variance (or maximizing R square) and aims to converge after a few iterations.

When we compare our R square values (competitive advantage = 16.9%, management control = 3.9%, and managerial risk taking = 8.3%) with those of similar studies (e.g., García-Granero et al. 2015, found R square = 15.2% and 32.9%), the R square values were contextually significant for the study and also had suitable explanatory power. The coefficient of determination (R square) suggests an influence on both the endogenous constructs. This is theoretically valid because there are many factors that determine a firm's competitive advantage, and innovative capability is one of them.

As shown in Table 4, innovation capability has a significant direct effect on a firm's competitive advantage ($\beta = 0.424$****, $t = 5.084$) which supports Hypothesis 1. Innovation capability has a significant effect on management controls ($\beta = 0.198$**, $t = 2.132$) which supports Hypothesis 2a. Additionally, management controls have a negative effect on competitive advantage ($\beta = -0.142$*, $t = 1.794$), which supports Hypothesis 2b. Thus, we find support for the theory that

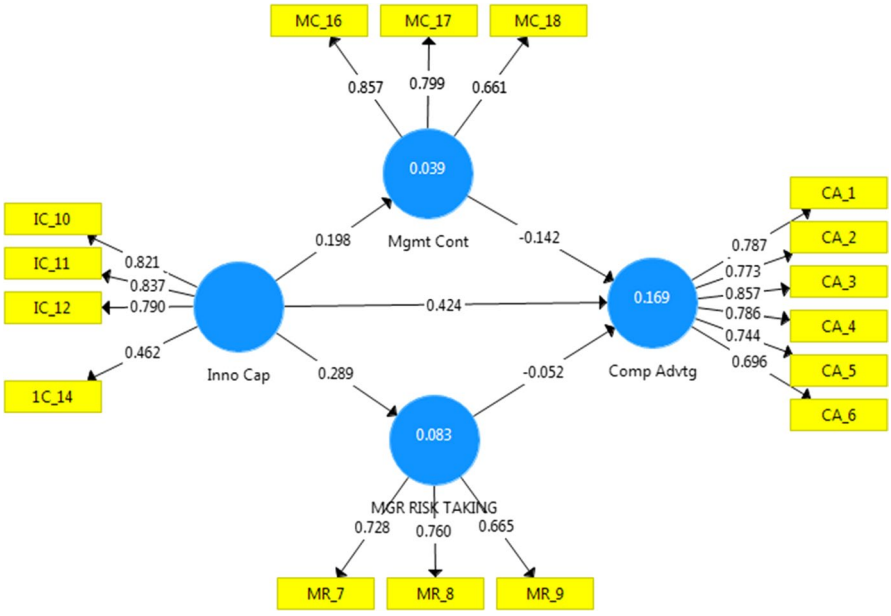

Fig. 1 The structural model

managerial controls lead to decreased competitive advantage. Innovative capability has a significant effect on managerial risk-taking ($\beta = 0.289$****, $t = 3.576$), which supports Hypothesis 3a. Finally, we did not find support for Hypothesis 3b that managerial risk-taking has a significant effect on competitive advantage ($\beta = -0.052$ n.s., $t = 0.520$).

The degree of predictive relevance of the exogenous constructs for the endogenous construct competitive advantage, which was measured reflectively, was estimated with the Q square value, which is calculated using the blindfolding procedure (Sarstedt et al. 2014). Since Q square is greater than 0, the model has predictive relevance, and a significant amount of variance is explained by our model (see Table 5).

4.3 Test for mediation

The PLS SEM algorithm relies on a non-parametric bootstrap procedure (here 165 cases, 5000 samples, no sign change option) to test the coefficients for their significance and to ascertain the significance of mediation effects (Preacher and Hayes 2008; Hair et al. 2013). The result of the bootstrapping process to check the significance of the standardized regression (effect) are given in Table 4. The evaluation of the structural model was conducted as propounded by Preacher and Hayes (2008) and Zhao et al. (2010). The statistical significance criteria for the individual paths in a mediation model is not a pre-condition to establish whether a particular mediator mediates the

Table 4 Significant individual path coefficients in the structural model

Structural path	Path coefficient (*t* value)	*p* values	Effect size (f square)	Conclusion
Inno Cap -> Comp Advtg	0.424 (5.084)	0.000****	0.193	Hypothesis 1 is supported
Inno Cap -> Mgmt Cont	0.198 (2.132)	0.034**	0.041	Hypothesis 2a is supported
Mgmt Cont -> Comp Advtg	−0.142 (1.794)	0.073*	0.023	Hypothesis 2b is supported
Inno Cap -> Mgr Risk Taking	0.289 (3.576)	0.000****	0.091	Hypothesis 3a is supported
Mgr Risk Taking -> Comp Advtg	−0.052 (0.520)	0.603 n.s	0.003	Hypothesis 3b is not supported

n.s. not-significant; *|t| ≥ 1.65 at $p = 0.10$ level; **|t| ≥ 1.96 at $p = 0.05$ level; ***|t| ≥ 2.58 at $p = 0.01$ level; ****|t| ≥ 3.29 at $p = 0.001$ level

Table 5 Predictive relevance

	SSO	SSE	Q^2 (= 1-SSE/SSO)
Comp Advtg	990.000	906.445	0.084
Inno Cap	660.000	660.000	
Mgr Risk Taking	495.000	481.952	0.026
Mgmt Cont	495.000	487.673	0.015

relationship between the two variables (Hayes 2009). The multiple mediating effect, as described by Preacher and Hayes (2008), is presented in Table 6.

Both the mediators, when considered together, had a non-significant indirect effect of −0.044 ($t = 1.117$ and $p = 0.264$), which supports H4. When both the mediators were considered simultaneously, their indirect effects were not significant, and the total indirect effect was not significant. It is relevant to point out here that one of the indirect effects tested in our study is the unique ability of the mediator management controls to account for the effect of innovative capability on competitive advantage. This specific indirect effect was found to be non-significant. Preacher and Hayes (2008) also suggested that all mediators should be included in the same model in the interest of parsimony and precision. This supports the theory (Huselid 1995; Batt 2002) that reduced managerial control is an important component of high performance, which eventually leads to competitive advantage. This reduction of the impact of the management controls is due to the risk-taking ability of managers. Another explanation could be that an ability to take risky decisions with incomplete information requires fewer formal controls (Turner and Makhija 2006).

Further as per the guidelines of Chin et al. (2013) and Nitzl et al. (2016), the difference between the values of (a1b1) and (a2b2), along with the calculated percentile bias-corrected confidence intervals, were ascertained. Since both confidence intervals contain the zero value, (m1–m2; 0.004986, −0.02878), management controls do not have a stronger mediating effect than managerial risk taking (Rodríguez-Entrena et al.

Table 6 Multiple mediating effect. Reproduced with permission from Preacher and Hayes (2008)

Mediator	Indirect effect	Mean	Bias	Percentile lower	Percentile higher	Percentile lower + Bias	Percentile higher + Bias	Decision
Mgmt Cont	a1 * b1	−0.029	0.001	−0.071	0.012	−0.069	0.013	H4 supported
Mgr Risk Taking	a2 * b2	−0.015	0.0	−0.074	0.042	−0.074	0.042	
Total indirect effect	(a1 * b1) + (a2 * b2)	−0.044	0.016	−0.117	0.027	−0.101	0.043	

Table 7 Test for goodness of fit

	Original sample (O)	Sample mean	Standard deviation (STDEV)	*t* statistic (|O/STDEV|)	*p* value
Saturated model	0.088	0.066	0.007	12.538	< 0.001
Estimated model	0.089	0.067	0.006	13.922	< 0.001

2016). This further suggests that managers' initiatives can counterbalance the restricting controls since these controls are generally an inherent characteristic of highly innovative firms.

4.4 Test for goodness of fit

A goodness of fit measure (Henseler and Sarstedt 2013) was used to ascertain the standardized root mean square residual (SRMR). The SRMR was calculated to be 0.089, which was well below the requirement of 0.14. These results are given in Table 7.

5 Discussion

Using the data collected from 165 practicing managers at major Indian IT firms, this study tests the dynamic capability framework using a multiple mediation model of the relationship between innovation capability and competitive advantage. As shown in Tables 4 and 6, a large degree of support is provided for the hypothesis of our study. Preacher and Hayes (2008) suggested that, to investigate multiple mediation, there are two steps to be followed. First, investigate the total indirect effect. Second, investigate the specific indirect effect of each mediator. They further suggested that either or both types of indirect effect may be of theoretical interest. Our study is an attempt in this direction. The managers in our target population of large IT firms developed capabilities and skills in their roles and an ability to proactively innovate, even in controlled environments, since the total indirect effect of the two mediators, management control and managerial risk taking, was found to be non-significant. Williams and MacKinnon (2008) suggested that, by comparing the mediators (here "management control" and "managerial risk-taking"), the strength of a mediating effect can be ascertained. To test the difference between the two specific mediating effects (Lau and Cheung 2012), we calculated Dm = M1 − M2. To study the statistical difference between (a1 * b1) − (a2 * b2), the guidelines of Chin et al. (2013) were used. Our study confirms the findings of Golant et al. (2015), who asserted that management control and risk management were both required in firms. Our model has predictive relevance for the endogenous construct of competitive advantage, which makes it relevant and useful for decision making in the organizational context.

The three pillars of DCs include process, position, and strategy (Teece et al. 1997). A capability attempts to increase the usefulness of the resources of the firm (Makadok 2001), and innovative capability is a key DC which precedes a firm's

competitiveness. According to the literature, the total effect is the summation of the direct effect plus the indirect effect of the mediator "management controls," plus the indirect effect of the mediator "managerial risk-taking." The managerial risk-taking ability can counterbalance the formal controls the firm has implemented to govern the firm. As shown in Table 6, the specific indirect effect of management controls (a1 * b1) is −0.029, and the specific indirect effect of managerial risk-taking ability (a2 * b2) is −0.015. This means that, when both the mediators act together, the total indirect effect is −0.044 n.s. Theoretically, the possibility of only a direct effect and no mediation is ruled out. The possibility of no effect is also ruled out, since the direct effect is significant. These calculations comprehensively rule out any alternative explanation of the findings. These findings are of significance since they have ramifications in various operational choices of firms that operate in competitive environments and need to innovate to stay competitive. We found, interestingly, that the direct effect and indirect effect point in different directions. The direct effect is positive, and the indirect effect (in both the cases of mediation) is negative. In statistical terms, this means that X (the independent variable) still explains a portion of Y (the dependent variable) that is independent of M (the mediators). This is consistent with prior studies (Teece et al. 1997), since DC theory also suggests that there can be many other sources of competitive advantage apart from the innovative capability of the firm. This was also confirmed by Bisbe and Otley (2004), who stated that innovators use controls to weed out innovations inconsistent with the firm's goals.

To the best of the author's knowledge, the DCs, along with their multiple mediating impacts, have not been empirically tested in an emerging market context, in an evolving industry such as the Indian IT sector. The study contributes to the strategic management literature by validating DC theory in an emerging market context using a large-scale survey. From a methods perspective, this study illustrates the application of a multiple mediation methodology in the context of a DC framework, since the extant knowledge in this domain is limited.

Our study also supports Holzweber et al. (2012), who found that the development of DCs depended on information exchange and synchronization, which eventually lead to enhanced firm performance. Our study extends Powers' (2007) argument by suggesting that risk-taking managers can neutralize stringent controls, which can inhibit innovation. This also presumes that controls cannot be and should not be done away with, but instead need to be managed. We can, however, not comment on the level of risk-taking ability (Batt 2002) required in the process, which is beyond the scope and objectives of this present study. We find support for DC theory (Helfat et al. 2009), since it was found that innovative capability can lead to an organizational advantage. This has been observed in many industries in different contexts. This study presents a comprehensive picture encompassing the twin and opposing forces of management controls and the risk-taking capability of the concerned managers. The reason as to why the risk-taking ability can counterbalance the controls can be traced back to DC theory. Managers learn, innovate, adapt, and develop insights that assist in the times of transition, since DCs are learned competences for dealing with change (Teece et al. 1997).

There is a strong connection amongst the variables studied. Kaplan (2011, p. 373) asked: "What is the appropriate balance between innovation and risk

management and how can this balance be maintained?" Our findings indicate that the combined mediating effect of management controls and managerial risk-taking ability makes the total effect non-significant. Managers, by their risk-taking ability, can mitigate the limiting impact of managerial controls. This has ramifications in human resource planning processes such as managerial hiring, incentives design, executive compensations, and organizational structure decisions. Employees draw strength from the argument that employees have latent skills and talent for innovation (Ford 2001). The resource-based theory (Wernerfelt 1984) builds on this and suggests that these skills and talents are not fully used for the benefit of either the employees or the firm. The authors believe that managers can nurture their innovative ideas as well as those of their employees. According to Kesting and Parm Ulhøi (2010, p. 66), "Employee-driven innovation is embedded in everyday critical and reflective experiences and work practices." As Kesting and Parm Ulhøi further asserted, the innovative changes are a result of firm's routines. These routines presume the presence of management controls. The resulting innovative changes lead to new and promising business (Henderson and McAdam 2001).

DCs include innovative capabilities (Teece et al. 1997), along with many more elements. Management controls can be further studied, examining the separate effects of positive and negative controls (Schaan 1983) and of formal and informal controls (Guidice and Cullen 2007). These forces sometimes counterbalance each other and at other times magnify each other's impact. We find that, in an environment of hyper-competition, these capabilities get support from the inherent risk-taking ability of managers, thereby helping a firm respond to change more effectively. The findings of our study are consistent with the assertion of Curtis and Carey (2012) that it is possible to balance risk taking against controls; managers should be neither so risk averse as to discourage innovation, nor so risky in operations as to endanger the firm's existence.

Our study also has certain limitations. The first limitation is the study's focus on a single industry; the results cannot be generalized to other industries. More studies need to be conducted on other industries. Second, the data are from major Indian IT firms only. Smaller IT firms and start-ups are not considered. These firms can also be of significance, as the IT sector faces technological disruptions as a regular occurrence. Thus, whether DCs can be tested for the small and medium IT firms should be the scope of another study, since these firms could have more fluid organizational processes and routines than established IT firms. Third, this domain is an appropriate ground for identification of more mediators that have an impact on the variables under study. Finally, since this subject has been sparsely researched in the emerging market context, future research can also use a longitudinal design to re-examine the relationships. The study, given these limitations, still contributes to the understanding of the dynamic tension between managerial risk-taking abilities and management controls in an industry which is characterized by regular change due to innovation.

6 Conclusion

DC theory offers guidance on the possible factors affecting firms' competitive advantage (Teece 2007). The ability to innovate has a direct impact on firms' competitive advantage. When both mediators were considered together, they had a non-significant effect. We thus theorize that the effect of managerial controls is mitigated by managerial risk-taking ability; this knowledge has significant ramifications for organizational choices.

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