Effect of intellectual capital on dynamic capabilities

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Abstract

Purpose – The purpose of this paper is to examine the effects of intellectual capital (human, social and organizational capital) on dynamic capabilities (learning, integration, reconfiguration and alliance management).

Design/methodology/approach – A methodical review of relevant literature and the theory of resource-based view, knowledge-based view and dynamic capability view serves as a starting-point to develop a framework for linking intellectual capital with dynamic capabilities. A total of 241 managers from the public sector banks in India was selected as sample of study and structural equation modelling was applied to provide strong evidence for the hypothesis.

Findings – The study established a strong effect of intellectual capital dimensions on dynamic capabilities in the surveyed banking firms. Human and social capital had the most profound effect on learning, integration, reconfiguration and alliance management capabilities. As regards to organizational capital, an unexpected negative effect on reconfiguration and alliance management capabilities was observed.

Originality/value – The study clarifies the role of knowledge for various capability developments. One of the significant contributions is with reference to the linkages of structural aspects of knowledge and dynamic capabilities, a link that can barely be seen in the existing literature. To the author's knowledge the present study makes a preliminary effort to broaden the concepts appeal in new geographical boundaries and empirical context, thus making an original contribution to the Indian banking industry and strategic management literature, significantly.

Keywords Social capital, Dynamic capabilities, Human capital, Intellectual capital, Organizational capital

Paper type Research paper

Introduction

Due to the rapid global evolution of the knowledge economy and intensified competition, organizations are encountering gruelling challenges to sustain their competitiveness. In this challenging and dynamic business landscape, dynamic capability has emerged as a vital element for firms' growth, survival and competitiveness. This significance of dynamic capability has attracted a huge amount of responsiveness from the research communities (Ambrosini and Bowman, 2009; Ambrosini *et al.*, 2009; Eisenhardt and Martin, 2000; Helfat and Peteraf, 2009; Li and Liu, 2014; Teece, 2007; Zollo and Winter, 2002; Zahra *et al.*, 2006) not only in its native domain of strategic management, but also in logistics (Glenn *et al.*, 2005), risk management (O'Connor *et al.*, 2008) marketing and entrepreneurship (Barreto, 2010). From this overarching concern, dynamic capability becomes the common goal of every firm for achieving strategic agendas, and research on the dynamic capability factor turns out to be the need of the hour (Ambrosini *et al.*, 2009; Chien and Tsai, 2012; Eisenhardt and Martin, 2000; Helfat and Peteraf, 2009; Lin and Wu, 2014;

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McKelvie and Davidsson, 2009; Nieves and Haller, 2014; Singh *et al.*, 2015; Tseng and Lee, 2014; Wu, 2006; Wang and Ahmed, 2007; Zahra *et al.*, 2006).

During initial conceptualization of dynamic, Teece *et al.* (1997) placed knowledge at the centre of dynamic capability and outlined it as a significant factor. Following this line of thinking, considerable amount of scholarly submissions have endorsed knowledge explanations for building firms dynamic capabilities. However, prior findings are inadequate, due to lack of attention on knowledge dimensions (Ambrosini *et al.*, 2009; Prieto and Easterby-Smith, 2006; Wu, 2006). Recently, following resource-based view (RBV) theorization, scholars revised their investigatory angle and viewed knowledge from an intellectual capital viewpoint. It is maintained that a unique configuration of knowledge resources in the form of intellectual capital enhances firms' capability to renew its resource base and empowers them to develop their dynamic capabilities to win the market (Hsu and Sabherwal, 2012; Hsu and Wang, 2012; Nieves and Haller, 2014; Verona and Ravasi, 2003).

With this attention grabbing viewpoint, although results are on the better stage and offer valuable suggestions for devising this strategic tool, however could not become much attractive perspective. The reason that the literature review reveals, is lack of cognizance on the dimensions of intellectual capital and dynamic capabilities. Prior research has either adopted individualistic or holistic approach. With an individualistic approach both human and social capital dimensions of intellectual capital are the main focus of attention (Ambrosini *et al.*, 2009; Blyler and Coff, 2003; McKelvie and Davidsson, 2009; Nieves and Haller, 2014; Reijsen *et al.*, 2014). The role played by organizational capital for building dynamic capabilities is mostly neglected. Similarly, the holistic approach has a much conventional stance where dimensions are not evaluated. Similarly, dynamic capability has been studied merely as a single construct or few dimensions of dynamic capability such as R and D capabilities and marketing capabilities are taken into account (Hsu and Sabherwal, 2012; Hsu and Wang, 2012). Consequently, decision-making process and strategic action concerning the capability portfolio building and respective knowledge resource (i.e. personal, relational and structural aspects of knowledge) investment is in the inconclusive state of knowledge. And, the line of inquiry stands at its preliminary phase, as mentioned by Helfat and Peteraf (2009).

Furthermore, although dynamic capability scholars have devoted plethora of attention in order to broaden its empirical context such as in manufacturing (Sher and Lee, 2004), information technology (Wu, 2006), semi-conductor (Macher and Mowery, 2009) and hotel industry (Nieves and Haller, 2014), dearth of empirical research surrounds this domain in banking sector. More explicitly, on the antecedents of dynamic capability prevails, despite the fact that banking sector has been challenged with intensified competitiveness, and needs directions to integrate their assets and improve their ability for seizing market place opportunities, and achieving sustainable operations and competitiveness (Mondal and Ghosh, 2012; Shih *et al.*, 2010). Since industries differ in various aspects and no tangible research to date has been found on linkages between intellectual capital and dynamic capabilities in the banking sector, this study therefore paves the way to bridge a significant gap in the literature and makes an original contribution in the banking sector and strategic management literature.

Building on the three theoretical propositions, namely, RBV, KBV and dynamic capability view (DCV), the present study raises a prominent research question:

RQ1. Does intellectual capital comprising of human capital, social capital and organizational capital have effect on the development of different dynamic capabilities in the banking firms?

The study is also concerned to gauge the effect that each dimension of intellectual capital is likely to have on a bank's particular type of dynamic capabilities.

Utilizing a data set from 241 managerial-level employees of the select Indian public sector banks in India and applying structural equation modelling (SEM), the present study examines the research hypothesis, as discussed earlier.

This paper trails the following structure; introductory section is followed by conceptual framework and hypothesis. Then, research approach sheds light on statistical aspects of the study. Further, discussion and conclusion appears. Finally, the implication of the study and its limitations along with future research challenges.

Conceptual framework and hypotheses

Based on an extensive review and synthesis of intellectual capital and dynamic capability literature, conceptual framework of this study is depicted in Figure 1 that shows the several relationships between intellectual capital and dynamic capabilities. Essentially, the framework assumes that human, social and organizational capital dimensions of intellectual capital affects the development of learning, integration, reconfiguration and alliance management capabilities and illustrates the role of specific knowledge resources for developing different dynamic capabilities (learning, integration reconfiguration and alliance management capabilities).

In doing so, this study draws from basic idea that intellectual capital constitutes a unique configuration of a firm's resources that gives it nitty-gritties to renew its resource base and cultivate its dynamic capabilities in order to achieve outstanding performance and competitive advantage (Hsu and Sabherwal, 2012; Hsu and Wang, 2012; Nieves and Haller, 2014; Teece, 2000; Verona and Ravasi, 2003; Wu, 2006). This school of thought is consistent with what RBV, KBV and DCV highlighted, i.e. the prominence of knowledge resources in the development of capabilities (Barney, 1991; Grant, 1991; Grant, 1996a, b; Peteraf, 1993; Teece *et al.*, 1997). The constructs incorporated in the framework and their interactions will be discussed in the following section.

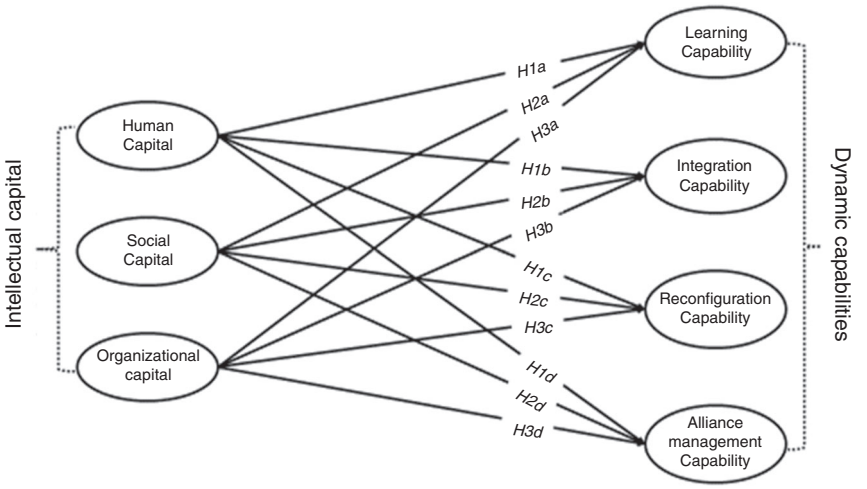

Figure 1.
A framework depicting the linkages between intellectual capital and dynamic capabilities

Dynamic capabilities

Since the conceptualization of DCV (Teece *et al.*, 1997) numerous researchers have explored the definitions, precursors, processes and aftermaths of dynamic capabilities (Ambrosini *et al.*, 2009; Chien and Tsai, 2012; Easterby-Smith *et al.*, 2009; Helfat *et al.*, 2007; Lin and Wu, 2014; Sher and Lee, 2004; McKelvie and Davidsson, 2009; Nieves and Haller, 2014; Prieto and Easterby-Smith, 2006; Teece, 2007; Tseng and Lee, 2014; Wu, 2006; Zahra *et al.*, 2006). However, consensus is somehow missing on its conceptualization. Originally, dynamic capability was defined as "firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments" (Teece *et al.*, 1997). Further, dynamic capability was explained as "a learned and stable pattern of collective activities directed to the development and adaptation of operating routines" (Zollo and Winter, 2002). Later on, dynamic capabilities was described as "firm's behavioural orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage" (Wang and Ahmed, 2007).

Based on prior literature this research conceptualizes dynamic capability as firm's capability to manage alliances, learn, integrate and reconfigure resource base to address the changing business conditions. Learning capability refers to the firm's capability to make operations more efficient and effective by acquiring, changing and discarding resources in accordance with environmental changes (Lavie, 2006). Integration capability denotes the capacity of the firm, to evaluate the existing resources value, integrate them, and thereby develop a new-fangled resource base and capabilities which further determines firm's competence to meet environmental challenges (Teece *et al.*, 1997). Reconfiguration capability refers to the recombination and transformation of existing resources that empower firm's to acclimatize fluctuating market conditions (Teece *et al.*, 1997) by timely responding to the market changes and competitors (Lavie, 2006). Alliance management capability refers to "the capacity to purposefully create, extend, or modify the firm's resource base, augmented to include the resources of its alliance partners" (Helfat *et al.*, 2007).

Intellectual capital

In 1969, Galbraith coined the term intellectual capital and outlined it as intellect, knowledge, skills and brainpower activity that whenever utilized, will create value. Since then, numerous interpretations have been arisen. Intellectual capital has been defined as packaged useful knowledge (Stewart, 1997) convertible into profit (Sullivan, 2000) and value (Edvinsson and Sullivan, 1996). It is also deliberated as a critical intangible asset for future competitiveness that firm should manage and deploy in order to achieve desired outcomes (Hsu and Sabherwal, 2012; Hsu and Wang, 2012; Mondal and Ghosh, 2012; Shih *et al.*, 2010; Wiig, 1997).

In this study, intellectual capital is defined as "the sum of all organizational knowledge resources, which resides in aspects within as well as outside the organization." It comprises of three distinct constructs, namely, human capital, social capital and organizational capital (representing knowledge resource embedded in individual, network and organizational level, respectively, Subramaniam and Youndt, 2005; Youndt *et al.*, 2004).

Intellectual capital and dynamic capabilities

Existing literature indicates a significant association of knowledge and dynamic capabilities. For instance, Teece *et al.* (1997) and Eisenhardt and Martin (2000) outlined

knowledge as a significant factor for firm's dynamic capabilities. Sher and Lee (2004) posited endogenous and exogenous knowledge as an impacting factor for developing dynamic capabilities in manufacturing and service firms. Wu (2006) established that Taiwanese IT enterprises build dynamic capabilities through knowledge resources. Chien and Tsai (2012) found that knowledge is a critical driver of dynamic capabilities in the Taiwanese restaurant chain. McKelvie and Davidsson (2009) associated employee human capital and founder's human capital with dynamic capability in new firms. Nieves and Haller (2014) linked human capital and organizational declarative and procedural knowledge with dynamic capabilities in the hotel industry. Lin and Wu (2014) mentioned the contributory role of valuable, rare, inimitable and non-substitutable resources for different dynamic capabilities in Taiwanese companies. Similarly, Reijsen *et al.* (2014) cited the significant linkage of internal social capital as opposed to external social capital with dynamic capability in large and SME's.

From this, knowledge resources embedded in individual, network and organizational structure and processes constitutes a unique configuration of a firm's resources at one side and at the other, possession of knowledge resources builds different types of dynamic capabilities. Building on these evidences, this study analyses the effect of human, social and organizational capital on learning, integrating, reconfiguration and alliance management dynamic capabilities.

Human capital and dynamic capabilities

Researchers designate personages as the fundamental locus of knowledge and define their knowledge, skills and abilities as human capital (Youndt and Snell, 2004). Taking into consideration this personal aspect of knowledge resources, studies have yielded enough evidence that learning, creating, integrating, utilizing and reconfiguration capabilities of the firm are highly dependent on knowledgeable, skilled and experienced employees (human capital theory) (Augier and Teece, 2009; Ambrosini *et al.*, 2009; Ambrosini and Bowman, 2009; Hsu and Wang, 2012; Teece, 2007). Employees having industry experience identify the changes and take superior decisions on resource allocation and path finding strategy thereby predicting the outcomes precisely. From this, firms tend to be more capable of facing the changing business conditions (Eriksson, 2014; King and Tucci, 2002; Macher and Mowery, 2009; Penrose, 1959). It follows that capability have bearing on an individual's knowledge, motivation, skills, experiences and probabilistic judgments (Verma and Rao, 2016). Hence human capital supports the evolution of dynamic capabilities.

King and Tucci (2002) posited that managers with prior industry experiences support identification and exploration of opportunities which is central for developing integration capability. Teece (2007) signified that the availability of the right brain is a necessary condition for developing all types of dynamic capabilities. Bruni and Verona (2009) highlighted that individuals knowledge and experience act as a dynamic contributor in knowledge accumulation and utilization that is, as mentioned by Pandza *et al.* (2003) significantly associated with integration and reconfiguration capability. Kale and Singh (2009) discovered that individual's partnership-related experiences impart learning, generate new knowledge and cultivate alliance management capabilities.

In strategic alliances context, Anand and Khanna (2000) and Otto (2012) also demonstrated that alliances know-how concomitant with former and continuing alliance practices creates learning and develops learning capabilities. Recently, Nieves and Haller (2014) maintained that employees' knowledge and skills encourage resource renewal and enhances learning and reconfiguring capabilities. Therefore, it is connoted

that the firms possessing higher levels of knowledgeable, skilled, experienced employees, identify changes, create and apply knowledge thereby develop various types of dynamic capabilities to act on potential opportunities and threats efficiently. Hence, taken together, the below given hypothesis is formulated:

H1. Human capital has a significant effect on (a) learning (b) integration (c) reconfiguration (d) and alliance management capabilities of the firm.

Social capital and dynamic capabilities

On the relational facet of knowledge resources, researchers define one essential form of knowledge as social capital that resides in interactions of individuals and networks of relationships (Nahapiet and Ghoshal, 1998; Subramaniam and Youndt, 2005). They conceptualize it, as a contingent factor behind the occurrence of social ties, new alliances and partnerships.

The literature on social exchange theory highlights that strong ties and alliances play a vital role for the development of integration, reconfiguration and combination capabilities of the firm (Blyler and Coff, 2003; Eisenhardt and Martin, 2000; Grant, 1996a; Jiang *et al.*, 2010; Nahapiet and Ghoshal, 1998; Zollo and Winter, 2002). Prior alliance experiences enables organizations to acquire information for new opportunity and learn new knowledge and expertise, to create new processes that enhance organizational capabilities for grasping the opportunity (Ambrosini and Bowman, 2009; Grant, 1996a, b; Nahapiet and Ghoshal, 1998). It means that network relationships contribute to processes and routines which play an indispensable role to release, acquire and integrate the resources, ascertained as a strategic factor for dynamic capability (Eisenhardt and Martin, 2000; Blyler and Coff, 2003). Hence, social capital plays a vital role in the development of dynamic capabilities.

Reijsen *et al.* (2014) posited that social capital is a mechanism to realize the potential influence of knowledge on dynamic capability. Hsu and Wang (2012) argued that human capital will not realize in new resource development if it is not united with social networks and signify the social capital influence on dynamic capability. Kale and Singh (2009) and Otto (2012) maintained that prior alliances experience drives learning, creates knowledge, avoid mistakes, facilitates information and resource advantage, supports the identification of new opportunities and threats, thereby develop alliance management capabilities. Eriksson (2014) mentioned that network generated learning gives rise to resource configuration. Collating these opinions, a higher level of social capital enhances organization's ability to learn, integrate, reconfigure and manage alliances, thus encourages the development of dynamic capabilities. In the light of these rationalities, this study hypothesizes:

H2. Social capital has a significant effect on (a) learning (b) integration (c) reconfiguration (d) and alliance management capabilities of the firm.

Organizational capital and dynamic capabilities

Organizational capital is demarcated as "institutionalized knowledge and experience" which is codified and warehoused in systems, databases, processes, manuals, structures, routines, patents and the same (Youndt and Snell, 2004). A high level of institutionalized knowledge facilitates smooth flow of communication among partners in the networks of relationship create learning and accelerate the acquisition of new resource base (Youndt *et al.*, 2004) which is central to the notion of knowledge integration (Kang and Snell, 2009), enhancement and utilization (Hsu and

Sabherwal, 2012). It suggests the role of organizational capital as an enabling factor for dynamic capabilities.

Literature highlights that organizational structure and processes act as a formalized mechanism to impart learning, (Verma *et al.*, 2014) internalized, utilized, share and articulate organizational resources (Zollo and Winter, 2002) that further enhance the capabilities of the firm. Subramaniam and Youndt (2005) advocated that codified knowledge permits organizations to reinforce its prevailing know-how and helps in developing innovative capabilities. Benner (2009) maintained the plausible role of information technology in knowledge integration capability. Bruni and Verona (2009) recommend knowledge codification as an essential factor for integration and reconfiguration capabilities. Kang and Snell (2009) argued the positive effect of organic and mechanistic organizational capital on knowledge acquisition and integration.

Hsu and Wang (2012) and Sher and Lee (2004) also stated that organizational processes and IT facilitate knowledge accumulation and utilization, through an organized and established way, which is considered as a requisite element for dynamic capability. In the same line, Macher and Mowery (2009) argued that new or improved knowledge, generated through experiences is a vital element for dynamic capability, as it connotes renewal. For instance, organizational capital provides a positive culture, a contingent factor to impart learning and encourage individuals to acquire new knowledge and facilitates favourable environment that enhances organizational ability to create knowledge and leverage it to produce value and achieve its potential. Anand and Khanna (2000) pointed out that firm's experience related to alliance create learning and develop alliance learning capabilities that in turn, foster alliance management capability. Collating this discussion, organizational capital significantly affects the development of dynamic capabilities. Based on these specifics, this study hypothesizes:

H3. Organizational capital has a significant effect on (a) learning (b) integration (c) reconfiguration (d) and alliance management capabilities of the firm.

Research approach

Research context and sample

Banking firms in India provide the robust empirical context to conduct this research for two reasons: first, dynamic capability is vital for Indian banking firms for integrating their valuable assets and increasing their capabilities in order to attain sustainable competitive advantage during dynamically changing business conditions. This is because due to changing business conditions and implementation of financial liberalization, privatization and internationalization, Indian banks have experienced fierce competition, crises and evident instabilities in their business environment. Bank services stimulate the smooth functioning of other industries and determine the growth of the economy (Shih *et al.*, 2010; Mondal and Ghosh, 2012). Based on these impressive thoughts, such models are significant to guide the development of dynamic capabilities in banking firms.

Second, as being one of the most vibrant global economies, Indian economy (KPMG-CII Report, 2013), provides a platform to business entities to invest, compete and grow that craft sizeable uncertainty, competition and challenges for firms. Here, the dynamic capability notion is a necessity to address the turbulent business environment. This offers robust settings to study knowledge and capability associations that fit into the specific context to achieve competitive advantage and grow. However the prior submissions on this issue are derived from developed economies and therefore, limit the applicability of findings in emerging economies (Li and Liu, 2014) like India.

Taking into account the economic context, top ten Indian public sector banks were chosen as a sampling frame of the study based on their net sales, net profit, total asset managed, market capitalization, income, investment, number of branches and number of employees. Information on the banking groups was collected from the website of Reserve Bank of India and the respective banking firms. North region of India was the main focus. A simple random sampling method was utilized to identify the branches and respondents of the study. Grounded on organizational-level emphasis of the constructs, managers were ascertained as the key informants. To make on additional check on the appropriateness of respondents to this study, few questions were added to the questionnaire.

Measures

Being an exploratory study, all the measures of the study were drawn from an extensive literature review. Since the original scale of all constructs were developed in English that had been advanced and used in the Western context. The scales were prepared for usage in Indian context exhausting the forward and back translation procedures (Brislin's, 1970; Cha *et al.*, 2007). In this translation procedure, clarity of the items, cultural appropriateness of the translated items and common language, i.e. Hindi in Indian context were the major criteria to consider (Brislin *et al.*, 1973; McGorry, 2000). The language of the questionnaire were first translated from English to Hindi by a bilingual management professor after that translated back into English by another bilingual professor independently to certify uniformity of meaning. Two another bilingual experts and three strategic management experts were contacted to compare the English and Hindi versions of the scales and confirm the final wordings. Experts found both versions of the scales were comparable to a high degree of precision and suggest few modifications in order to eliminate the minor discrepancies. The final version used in the employed questionnaire was embraced once the experts were satisfied with the Hindi translation and linguistic equivalence. Throughout the questionnaire, seven-point-Likert-type scales were used extending from "strongly-disagree" (1) to "strongly-agree" (7).

Intellectual capital. Intellectual capital was modelled as a three dimensional second-order formative construct consisting of human capital, social capital and organizational capital, as a first-order construct which have five, five and four items, respectively (Subramaniam and Youndt, 2005; Youndt *et al.*, 2004). Each dimension individually determines the distinctive aspect of conceptual realm. Items measuring human capital are indicating the level of knowledge embedded in individuals. Social capital items are indicating the level of organizational knowledge residing in networks and relationships. Organizational capital items are indicating knowledge embedded in organizational structures, databases, processes and patents.

Dynamic capability. Dynamic capability was modelled as a four dimensional second-order construct comprising of learning, integration, reconfiguration and alliance management capability as a first-order dimension, drawing on prior literature. Each of these dimensions determines the distinctive aspect of conceptual realm and is measured individually to analyse its association with human capital, social capital and organizational capital. To measure learning, integration and reconfiguration capability, 12 items scale is used with four items for each (Eisenhardt and Martin, 2000; Teece *et al.*, 1997). As with alliance management capability, nine items were employed (Kandemir *et al.*, 2006). All the items are listed in the Appendix.

Data collection procedure

To fetch respondents' perceptions on employed constructs, Bourque and Fielder's (1995) two stage data collection process was followed. A draft questionnaire was first pre-tested by 20 top-level managers, two from each banking group to ensure the relevance and meaningfulness of the questionnaire. Along with cover letter then, 339 questionnaires were circulated to overall bank branches, between the time periods, January to May 2014. All 165 banking branches had multiple respondents ranging from two to three respondents. The valid and usable questionnaires were 241 in total (71.09 per cent response rate), of which females were 35.7 per cent and males were 64.3 per cent. Respondent's average age was 39.8 per cent. Regarding the experience, respondents with more than ten years were 77.2 per cent and below ten years accounted for 22.8 per cent. In order to check missing data points and the normality of the data distribution this study follows Kline (1998). Results indicate data normality and confirm that data set is free from outliers' issue. Kolmogorov-Smirnov test analyses the possible variance between the employed sample and population and indicated no significant difference on the confidence level of 95 per cent. Based on Armstrong and Overton (1977), the first three months response were considered as early response and the last two months response as late responses and further non-response biases were checked. And no statistical differences were identified (Wilks' $\lambda = 0.74$, $p = 0.43$).

Common-method bias checks

Due to cross-sectional research design with single self-report questionnaire, common-method variance may result in systematic measurement inaccuracy and cause partiality during the valuation of true association amongst constructs (Podsakoff and Organ, 1986). A Harman one-factor test was employed in an attempt to address this issue. Results reveal that a common-method bias does not confound the interpretations of the results.

Analytical strategy

The present study employed SEM (Anderson and Gerbing, 1988) to test the relations and validate the research model. This method is considered as a smart choice for researchers to test complex models with simultaneous linkages between investigated variables.

Empirical results

Measurement model

In the first step, confirmatory factor analyses (CFA) was directed to estimate the validity of the scale (content, convergent and discriminant validity) and assess the reliability of their composition (Fornell and Larcker, 1981; Gerbing and Anderson, 1988), employing the statistics programme AMOS 20. Further, the conceptual and empirical distinctiveness was measured by calculating correlation coefficient among the constructs. Table I reports mean, standard deviation and correlation. Results reveal that the highest correlation coefficient exist (0.623) between human capital and organizational capital. It submits that all employed constructs are distinct. Further, each constructs measurement model was evaluated. Table III shows the testing results of CFA of each measure that reveals that all values meet the statistical standards suggested by Bagozzi and Yi (1988) and Hu and Bentler (1995).

Constructs	Mean	SD	Correlation between constructs HC	SC	OC	LC	IC	RC	AMC
HC	3.58	1.235	1						
SC	3.49	1.22	0.462**	1					
OC	3.81	0.950	0.623**	0.563**	1				
LC	5.44	1.51	0.465**	0.291**	0.180*	1			
IC	3.63	1.14	0.392**	0.212**	0.256**	0.139*	1		
RC	4.93	1.56	0.367**	0.06	0.115*	0.621**	0.128*	1	
AMC	4.70	1.66	0.102*	0.28**	0.021	0.189*	0.197*	0.063	1

Table I.
Descriptive statistics and correlation

Notes: SD, standard deviation; HC, human capital; SC, social capital; OC, organizational capital; LC, learning capability; IC, integration capability; RC, relational capability; AMC, alliance management capability. *$p < 0.05$; **$p < 0.001$

Reliability

To ensure meaningful statistical outcomes from the proposed model, the statistical reliability of the scale was calculated, on the basis of factor loadings ($\geqslant 0.7$), composite reliability index (CR) ($\geqslant 0.6$) and Cronbach's coefficient (C-α) ($\geqslant 0.6$) (Anderson and Gerbing, 1988; Fornell and Larcker, 1981; Hair *et al.*, 1998). In the present model, each measure satisfies the suggested threshold, in case of Cronbach's coefficient all measures were above 0.830, factor loadings of all items were higher than 0.701 and composite reliability of all seven constructs were above 0.835. Thus, these numbers strengthen and confirm the statistical reliability of the scale, following above-mentioned statistical standard. Tables II and III shows the CR, C-α, factor loading, average variance extracted (AVE), maximum shared variance (MSV), average shared variance (ASV) of every construct and discriminant validity of measurement model.

Validity

Further, content, convergent and discriminant validity was calculated to evaluate statistical validity of the scale. The face and content validity was expected to be established bearing in mind that an exhaustive review of the literature was the base for scale that was further subjected to a process of revision by academicians and industry experts. Convergent validity was also maintained by testing factor loadings ($\geqslant 0.65$), CR ($\geqslant 0.8$), AVE ($\geqslant 0.5$).

Construct	χ^2	df	p	NFI	CFI	GFI	AGFI	RMR	RMSEA
HC	13.87	2	0.01	0.989	0.993	0.977	0.932	0.20	0.02
SC	53.12	3	0.00	0.946	0.951	0.912	0.736	0.05	0.04
OC	6.43	2	0.00	0.991	0.994	0.987	936	0.011	0.05
LC	8.29	2	0.03	0.957	0.962	0.970	0.850	0.013	0.08
IC	2.66	2	0.05	0.997	0.998	0.994	0.943	0.009	0.00
RC	3.25	2	0.00	0.991	0.997	0.993	0.967	0.38	0.05
AMC	73.3	20	0.00	0.963	0.975	0.937	0.887	0.076	0.06

Table II.
Evaluation of the measurement model of each construct

Notes: χ^2, Chi square; df, degree of freedom; p, significance value; NFI, normed fit index; CFI, comparative fit index; GFI, goodness of fit index; AGFI, adjusted goodness-of-fit; RMR, root mean square residual; RMSEA, root mean square error of approximation; HC, human capital; SC, social capital; OC, organizational capital; LC, learning capability; IC, integration capability; RC, relational capability; AMC, alliance management capability

Construct	CR	Range of FL	C-α	AVE	MSV	ASV	HC	SC	OC	LC	IC	RC	AMC
HC	0.952	0.749-0.905	0.951	0.800	0.388	0.186	0.895						
SC	0.935	0.782-0.819	0.935	0.741	0.317	0.124	0.462	0.861					
OC	0.927	0.799-0.850	0.926	0.760	0.388	0.136	0.623	0.563	0.872				
LC	0.835	0.894-0.910	0.830	0.560	0.386	0.129	0.465	0.291	0.180	0.748			
IC	0.953	0.851-0.891	0.952	0.834	0.154	0.056	0.392	0.212	0.256	0.139	0.913		
RC	0.847	0.812-0.842	0.847	0.580	0.386	0.093	0.367	0.060	0.115	0.621	0.128	0.762	
AMC	0.954	0.801-0.902	0.955	0.700	0.078	0.028	0.102	0.280	0.021	0.189	0.197	0.063	0.836

Notes: CR, composite reliability; FL, factor loadings; AVE, average variance extracted; MSV, maximum shared variance; ASV, average shared variance; HC, human capital; SC, social capital; OC, –organizational capital; LC, learning capability; IC, integration capability; RC, relational capability; AMC, alliance management capability

Table III. Reliability and validity

Following the approach of Fornell and Larcker (1981), Anderson and Gerbing (1988) and Hair *et al.* (1998). As specified in Table II, factor loadings, CR and AVE for all constructs are above the required threshold suggested by scholars and meet all three benchmarks' of convergent validity.

Discriminant validity was evaluated by using three approaches. First, the squared correlation of the construct as well as any of the other construct in the study should be greater than each construct's AVE (Fornell and Larcker, 1981). Second, the correlation amongst the investigated constructs should be lesser than 0.7 in absolute terms (Bagozzi and Baumgartner, 1994). Third, AVE of each construct should be greater than the constructs MSV and ASV (Hair *et al.*, 1998). The results in Table III specify that measures satisfy the given criteria of all three approach thus, upholding satisfactory discriminant validity. Finally, goodness-of-fit measures were calculated to test the fitness of a measurement model based on the work of Bagozzi and Yi (1988) and Hu and Bentler (1995). Results reveal that the present model fulfils the recommended threshold and confirms the measurement model fit (χ^2/df = 2.319, GFI = 0.766, AGFI = 0.726, NFI = 0.845, CFI = 0.905, PGFI = 0.654, PNFI = 0.764, RMSEA = 0.064, RMR = 0.080).

Structural model: estimation of causal model

In the second step, SEM evaluates the research model and tests the hypothesized relationships. The estimation of goodness-of-fit measures of the proposed model indicates that model fit is satisfactory (Bagozzi and Yi, 1988; Hu and Bentler, 1995) as shown at the bottom of Figure 2. (GFI is 0.90, AGFI is 0.86, NFI is 0.89, CFI is 0.94 and RMSEA is 0.03). Therefore, overall validity of research model is supported that allowed for testing of hypothesized relationship. Next, the significance of each hypothesized path of the research model was examined. Table IV and Figure 2 demonstrate the hypothesis testing results and reveals operational linkages among the latent constructs.

In the first cluster of hypotheses (*H1a*, *H1b*, *H1c* and *H1d*), analytical results established significant relationship of human capital with learning ($\beta = 0.452$, $\rho = 0.02$), integration ($\beta = 0.384$, $\rho = 0.001$), reconfiguration ($\beta = 0.355$, $\rho = 0.001$) and alliance management capabilities ($\beta = .\ 275$, $\rho = 0.02$), as specified in Table IV and Figure 2. Thus the analytical results provide strong support for *H1a*, *H1b*, *H1c* and *H1d*.

In the second cluster of hypotheses (*H2a*, *H2b*, *H2c* and *H2d*), analytical results reveal statistically significant relationship of social capital with learning ($\beta = 0.289$, $\rho = 0.001$), integration ($\beta = 0.265$, $\rho = 0.03$), reconfiguration ($\beta = 0.276$, $\rho = 0.02$) and alliance management capabilities ($\beta = 0.295$, $\rho = 0.02$) thus supporting *H2a*, *H2b*, *H2c*, *H2d*.

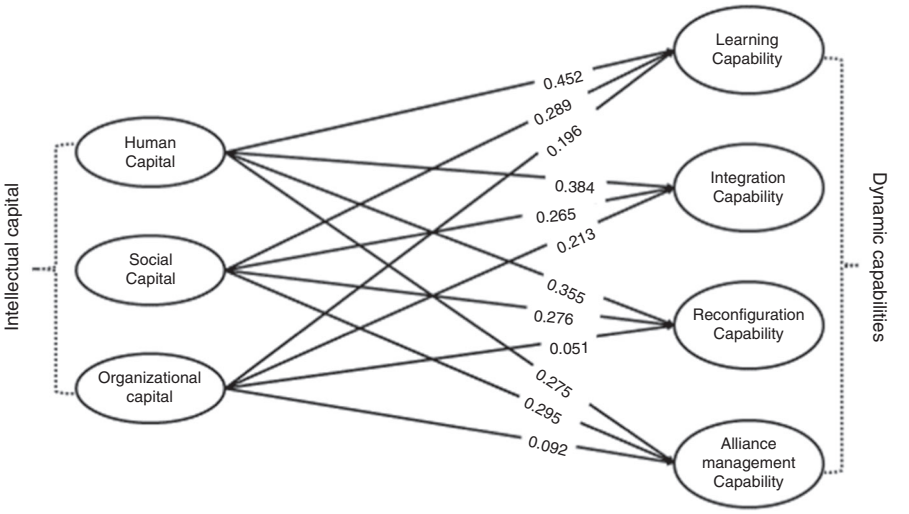

Figure 2.
Testing results

Notes: CFI = 0.94; GFI = 0.90; AGFI = 0.86; NFI = 0.89; RMSEA = 0.03

Hypothesis	β	ρ	Remarks
H1a	0.452	< 0.001	Supported
H1b	0.384	< 0.001	Supported
H1c	0.355	< 0.001	Supported
H1d	0.275	< 0.02	Supported
H2a	0.289	< 0.02	Supported
H2b	0.265	< 0.03	Supported
H2c	0.276	< 0.02	Supported
H2d	0.295	< 0.02	Supported
H3a	0.196	< 0.05	Supported
H3b	0.213	< 0.03	Supported
H3c	0.051	< 0.61	Not supported
H3d	0.092	< 0.46	Not supported

Table IV.
Hypothesis testing results

Notes: *B*, estimates; ρ, significance value

In the third cluster of hypotheses (*H3a*, *H3b*, *H3c* and *H3d*), analytical results indicate that organizational capital is significantly related to learning ($\beta = 0.196$, $\rho = 0.05$) and integration capabilities ($\beta = 0.213$, $\rho = 0.03$) thus supporting *H3a* and *H3b*. However, contrary to this, the relationship of organizational capital with reconfiguration ($\beta = 0.051$, $\rho = 0.61$) and alliance management capabilities ($\beta = 0.092$, $\rho = 0.46$) is not statistically significant. Thus, *H3c*, *H3d* are not statistically supported.

Discussion and conclusion

The empirical analysis has revealed several key findings.

First, analytical results indicate that human capital contributes remarkably to the development of learning, integration, reconfiguration and alliance management capabilities in the surveyed banking firms. This illustrates that firm's aforesaid capabilities are heavily contingent on knowledgeable and experienced employees

capable of identifying the changes and renewing organizational resource base, in turn. This explanation is constant with RBV, KBV and DCV theorizations and prior scholarly submissions (Augier and Teece, 2009; Grant, 1996a; Kale and Singh, 2009; Macher and Mowery, 2009; Nieves and Haller, 2014; Mckelvie and Davidsson, 2009).

Second, social capital significantly effects the development of learning, integration, reconfiguration and alliance management capabilities in the banking firms. This explains that social capital encourages learning, supports management of alliances and influences integration, reconfiguration and conversion of resources into dynamic capabilities. These findings are constant with the argument advocated by RBV, KBV and DCV proponents that firms need to recognize the knowledge embedded in the network relationship, alliances and partnership to develop their resources and capabilities (Blyler and Coff, 2003; Jiang *et al.*, 2010; Reijsen *et al.*, 2014) as well as create and manage their alliances (Kale and Singh, 2009; Otto, 2012).

Third, the study confirms organizational capital as a significant predictor of learning and integration capabilities in the banking firms. With the exception of Hsu and Wang's (2012) study, organizational capital and dynamic capability have been rarely examined together in the existing literature. Results suggest that firm's knowledge resource embedded in structure, processes, database and manuals, supports learning and integration capabilities which is constant with the prior submission of Hsu and Wang (2012). Contrary to the influence of human and social capital, the effects of organizational capital on reconfiguration and alliance management capabilities are not found positive in the banking firms. It warrants further research attention. Thus, results submit a strong illustrative influence of the sub-model unfolding directional connections of intellectual capital with dynamic capability. This finding upholds the inferences of former studies (Hsu and Wang, 2012; Hsu and Sabherwal, 2012).

The final attention grabbing findings of this study is parallel with Penrose's (1959) viewpoint, pertaining to alterations in organizational knowledge and the corresponding fluctuation in the generation and utilization of the firm's resources and advancement of capabilities. The study reveals that the significance of human capital, social capital and organizational capital varies across the different dynamic capabilities. Human capital exerts a significant influence on learning, integrating and reconfiguring capabilities of the firm to grow along with market changes and respond to the environment, above and beyond that of social capital and organizational capital. In terms of alliance management capability, social capital has a vital role than the human capital.

Theoretical contributions of the study

This study addresses the un-clarified and under-explored issues left by previous researchers in numerous ways. First, the study funds to the emerging knowledge on dynamic capability evolution. Second, the study postulates explicit details on the role of specific knowledge resource for developing different dynamic capabilities. Prior literature basically examines the association in a holistic pattern or else, concentrates on personal or relational aspects of knowledge resources and generally left out structural aspect. Third, this study fulfils the methodological demand of the dynamic capability domain as mentioned by Prieto and Easterby-Smith (2006) by employing SEM. Fourth, this study broadens the concepts appeal in new geographical boundaries and empirical context. Fifth, three influential paradigms of strategic management, i.e. RBV, KBV and DCV are jointly applied first time in the banking industry. Overall, this study is an original contribution to the banking industry and strategic management literature that offers a rich set of results.

Managerial implications of the study

This study has key implications for the managers willing to nurture or develop dynamic capability portfolio of the firm. Although dynamic capability can be developed, organizational initiatives may go pear-shaped due to lack of awareness on the critical drivers of the particular type of dynamic capability. The study puts forward intellectual capital as a vital driver and clarifies the role of each dimension of intellectual capital on different dynamic capabilities. Thus, this study serves decision makers a base for strategic decision making regarding specific dynamic capability development and respective knowledge resources investment.

To develop learning, integration, reconfiguration and alliance management capabilities, managers are suggested to focus on knowledgeable individuals and advised to empower them for suggesting new ideas and prospects. The creation of appropriate setting that can nurture a positive societal communication culture and reprocess organizational knowledge resources is also recommended. In case of alliance management capability, first thrive should be to build social networks and partnership. The value creating role of organizational capital for developing learning and integration capabilities was also informed. It is strongly recommended that the bank managers should integrate strategies and programs for nurturing intellectual capital in order to strengthen their dynamic capabilities. In this regard, the study satisfies the requisite of the banking industry undergoing fierce competition and struggling for sustainable competitiveness. Given, the implication of intellectual capital on dynamic capabilities in surveyed banks in India, managers in other developing economies should also recognize the fundamental phenomenon behind the evolution of different dynamic capabilities.

Limitations and future avenues

The present study has definite limitations that offer the possible areas for further research undertakings. First, the cross-lagged nature of the present research prevents the examination of causal relationship within a large span of time and upholds the interpretation of the results with caution. Thus, longitudinal studies would be valued to realize how the association of intellectual capital and dynamic capabilities develop and fluctuate over time. Second, employed self-report data may bring potential common-method variance. Although several cures have been taken, yet, future research should consider the perceptions of the numerous agents involved in developing dynamic capabilities.

Third, the findings achieved at this juncture may not be exclusively generalizable to other sectors as the present empirical study has focused especially on the banking sector. Further, India being an emerging economy, the setting differs in various aspects with regards to other developed or under-developed economies thus the findings should be applied carefully on firms operating in other economies. In this concern, it would be interesting to find out how learning, reconfiguration, integration and alliance management capabilities, are manifested through intellectual capital in other businesses and economy context. More specifically, forthcoming research may focus on a more heterogeneous national setting for analysing this phenomenon and exploring how the influence of intellectual capital dimensions diverge from those acknowledged in this study.

Fourth, international-level studies would also be worthwhile to elucidate better the detected associations and their temporal development. Fifth, given that the negative associations between organizational capital and reconfiguration and alliance

management can be explained by the less usage of structural aspects of knowledge. It reflects another potential future avenue. Sixth, identification of the strategies for fostering intellectual capital could be a next logical footstep for following up studies. At the end, this study considers the association between intellectual capital and firm's dynamic capabilities a promising research area.

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Further reading

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Appendix

Construct A.1. Intellectual Capital (seven-point Likert scale, adapted from Subramaniam and Youndt (2005) and Youndt *et al.* (2004)).

Sub-construct A.1.1. Human capital:

(1) employees are highly skilled;

(2) employees are widely considered the best in our industry;

(3) employees are creative and bright;

(4) employees are experts in their particular jobs and functions; and

(5) employees develop new ideas and knowledge.

Sub-construct A.1.2. Social capital:

(1) employees are skilled at collaborating with each other to diagnose and solve problems;

(2) employees share information and learn from one another;

(3) employees interact and exchange ideas with people from different areas of the company;

(4) employees interact with customers, suppliers, alliance partners, etc., to develop solutions; and

(5) employees apply knowledge from one area of the company to problems and opportunities that arise in another.

Sub-construct A.1.3. Organizational capital:

(1) organization uses patents and licenses as a way to store knowledge;

(2) organizational knowledge is contained in manuals, databases, etc.;

(3) organization's culture (stories, rituals) contains valuable ideas, ways of doing business, etc.; and

(4) organization embeds much of its knowledge and information in structures, systems, and processes.

Construct A.2. Dynamic capabilities (Seven-point Likert scale, adapted from Teece *et al.* (1997) and Eisenhardt and Martin (2000)).

Sub-construct A.3.1. Learning capabilities:

(1) frequent industrial knowledge learning programme;

(2) frequent internal educational training;

(3) frequent Knowledge sharing and learning group's establishment; and

(4) frequent internal cross-department learning programme

Sub-construct A.3.2. Integration capabilities:

(1) focus on customer information collection and potential market exploration;

(2) employ specialized firms to collect industry information for managerial decision;

(3) focus on integrating industry-related technologies to develop new products; and

(4) recording and integrating historical methods and experiences in handling firm issues.

Sub-construct A.3.3. Reconfiguration capabilities:

(1) clear human resource re-allocation procedure;

(2) fast organizational response to market changes;

(3) fast organizational response to competitor's actions; and

(4) efficient and effective communication with cooperative organization.

Sub-Construct A.3.4. Alliance management capabilities (Kandemir *et al.*, 2006):

(1) actively monitor the business environment to identify partnering opportunities procedure;

(2) actively monitor the business environment to identify partnering opportunities;

(3) regularly gather information about prospective partners from various forums (e.g. trade shows, industry conventions, databases, publications, internet, etc.);

(4) alert to market developments that create potential alliance opportunities.

(5) activities across different alliances are well-coordinated;

(6) systematic coordination of organizational strategies across different alliances;

(7) specific processes to systematically transfer knowledge across alliance partners;

(8) periodic reviews of its alliances to understand what it is doing right and where it is going wrong; and

(9) periodically collect and analyse field experiences from its alliances.

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