

Dynamic Rules of Action, Market Knowledge Absorptive Capacity and Firm Innovativeness: An Empirical Analysis

Dinamik Örgütsel Kurallar, Pazar Bilgisi Özümsene Kapasitesi ve Firma Yenilikçiliği: Ampirik Bir İnceleme

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ABSTRACT: The concept of market knowledge absorptive capacity (AC) is one of the dynamic capabilities that a firm has which is crucial for market success of the organization. However, the effect of market knowledge AC on the firm innovativeness (i.e. product and process) and the impact of dynamic rules of action embedded in organizational structure and behaviors on this capacity is interestingly missing in the AC literature. By investigating 241 firms, this paper indicates that a) dynamic rules of action are positively associated with market knowledge AC variables, b) market knowledge AC is positively related to firm innovativeness, c) firm innovativeness is positively associated with firm performance. In addition, we show that market knowledge AC influences firm performance via firm innovativeness.

Keywords: Dynamic Rules of Action, Market Knowledge, Absorptive Capacity, Innovativeness

JEL Classifications: M31, M20

ÖZ: Pazar bilgisi özümsene kapasitesi bir firmanın pazar başarısı için önemli olan dinamik yeteneklerinden biridir. Ancak ilginç olarak pazar bilgisi özümsene kapasitesinin firma yenilikçiliği üzerindeki etkisi ve örgütün yapı ve davranışlarında gömülü olan dinamik örgütsel kuralların bu kapasite üzerindeki etkisi literatürde incelenmemiştir. Bu çalışma 241 firmayı analiz ederek a) dinamik örgütsel kuralların pazar bilgisi özümsene kapasitesini oluşturan her bir değişken ile pozitif ilişkili olduğunu, b) pazar bilgisi özümsene kapasitesinin firma yenilikçiliği ile pozitif ilişkili olduğunu ve c) firma yenilikçiliğinin firma performansı ile pozitif ilişkili olduğunu göstermektedir. Ayrıca, pazar bilgisi özümsene kapasitesinin firma performansını firma yenilikçiliğinin aracılığıyla etkilediği de gösterilmektedir.

Anahtar Kelimeler: Dinamik Örgütsel Kurallar, Pazar Bilgisi, Özümsene Kapasitesi, Yenilikçilik

1. Introduction

Market knowledge, which refers to knowledge associated with customers and competitors (Day, 1994: 43; Kohli & Jaworski, 1990: 4), is a stimulant for a firm's knowledge (Nonaka, 1994: 27) and the driver of a market-oriented strategy (Day & Nedungadi, 1994: 32). At this point, we see that marketing theory researchers have paid increasing attention on the value of market knowledge to build industry awareness, support the strategic planning process, generate new products and services, and implement superior marketing plans and strategies (De Luca & Atuahene-Gima, 2007: 96). However, most of the researchers, especially influenced by knowledge-based view and market learning research stream, highlight that the capacity of a firm's

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employees to absorb market knowledge is critical for firm's success in the market (Jimenez-Castillo & Sanchez-Perez, 2013a: 1). In this respect, individual absorptive capacity, which means the capacity of an organizational member to evaluate, assimilate and use new knowledge to achieve commercial aims (Cohen & Levinthal, 1990: 131), becomes a vital success factor for the usefulness of market knowledge. Nevertheless, there are few studies investigating the relative importance of the absorption of market knowledge as a driver of firm innovativeness. Previous studies investigated either (1) the role of absorptive capacity within the context of technological knowledge (Lane, Salk & Lyles, 2001; Tseng, Pai, & Hung, 2011) or (2) theoretically impact of market knowledge absorptive capacity on firm innovativeness (Jimenez-Castillo & Sanchez-Perez, 2013a). However, consistent with the Zahra and George's (2002) approach to the AC, market knowledge AC should be viewed as processes of acquisition, assimilation (i.e. interpret and understand), transformation (i.e. combine newly acquired with current market knowledge) and utilization of this particular type of knowledge, which is the fundamental driver of firm innovativeness (Jimenez-Castillo & Sanchez-Perez, 2013a, 2013b). Hence, omitting or underestimating the importance of its components is likely to decrease the potential effect of market knowledge AC on the firm innovation performance.

In addition to the relationship between employee market knowledge AC and firm innovativeness, the organizational mechanisms and practices that aid the development of each of the four components of market knowledge AC should be explored empirically. While previous studies have investigated integrative dissemination mechanisms (i.e. unified internal communication and information technology integration) and market knowledge characteristics (i.e. the size of a market knowledge base -breadth and depth- and market knowledge tacitness) as the antecedents of employees' market knowledge AC (Jimenez-Castillo & Sanchez-Perez, 2013a), the literature has neglected the importance of dynamic rules of action, which organize employees' behaviors and underlie organizational routines as the antecedent of the employees' market knowledge AC. While researchers, based on the complex adaptive systems theory, emphasize the effect of dynamic rules of action in the forms of emergence (coordinated actions and interdependency among actors and firm product innovativeness) in organizations (Akgün, Keskin, & Byrne, 2014), the role of generative rules on market knowledge AC is specifically unexplored, and there is no systematic framework to explore their relationship in the marketing and organizational literature.

Therefore, this research investigates (1) the impact of dynamic rules of action on the market knowledge AC, (2) the role of market knowledge AC on firm innovativeness, which consists of product/service and process innovation and (3) the mediating role of firm innovativeness between market knowledge AC and the firm's financial performance.

2. Background and Relevant Literature

2.1. Dynamic Rules of Action

Dynamic rules of action, influenced by sustainable entrepreneurship theory (Parrish, 2010), which focus on the combination between economic, social, and environmental goals and the firm's organizational logic and practices (Gibbs, 2009: 65), and complex adaptive systems theory (Akgün et. al., 2014: 22), which focuses on the interplay between a system and its environment (McCarthy, Tsinopoulos, Allen & Rose-

Anderssen, 2006: 437), is a relatively new research area in the organizational routines and organization design literature. Reynaud (2005: 866), for instance, studied the link between rules and routines in a French Metro Workshop and concluded that dynamic rules of action shape an organization's behavior and constitute the background for its routines by demonstrating the differences between these concepts. These differences consist of the following (1) "rules of action are arrangements awaiting interpretation, while routines are rules already explicated, (2) rules of action are explicit while routines more often tacit, (3) rules of action have characteristics of a general nature, while routines are forms of pragmatic resolution that can be applied to a problem for which rules give only a theoretical, abstract, and general response". This means that from the complex adaptive system perspective, dynamic rules of action can be seen as a basic framework to systematize transactions among employees in an unfolding way, preventing conflicts of interest and opportunistic behaviors. As such, they play a particular role in providing an extensive repertoire of options and action flexibility for employees and departments (Akgün et. al., 2014: 25).

Dynamic rules of action also serve as heuristics to lead the process of organizing and result in an organization that takes any number of multiple forms, but that embodies a specific organizational character (Parrish, 2010: 511). Writings on the dynamic view of organizational design (e.g. Brief & Downey, 1983; Sarasvathy, 2004) point out that heuristic rules are used not to impose the structural result of organizing, but to lead an employee's recognition, framing, and responses to perceived problems. Specifically, as heuristic rules help to describe how employees understand and explain information and how they choose suitable behaviors and routines for coordinating actions (McEvily, Perrone, & Zaheer, 2003: 93), they also ensure a more compatible basis for reasoning through several context-specific design difficulties that had to be met as new circumstantial contingencies arose (Parrish, 2010: 516).

Parrish (2010: 522) argued that identifying generative rules provides a means of codifying the practical and generally intuitive specialty (tacit knowledge) of successful employees; the researcher then theoretically noted generative rules as principles of resource perpetuation, benefit stacking, strategic satisficing, qualitative management, and worthy contribution. These principles are incomplete by themselves because each one needs to be implemented in consideration of information involved in other principles.

2.2. Employee Market Knowledge Absorptive Capacity

Since the seminal study by Cohen and Levinthal (1990), the concept of AC has been a remarkable research area in strategic management (Lane & Lubatkin, 1998), technology management (Srivastava, Gnyawali, & Hatfield, 2015), international business (Wu & Voss, 2015), and organizational economics (Fayard, Lee, Leitch, & Kettinger, 2012). The researchers described AC in different ways and as a sophisticated and complicated concept. However, looking across these several descriptions and approaches, a broad view raised from the dynamic capabilities literature, which is that AC involves "a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge" (Cohen & Levinthal, 1990: 131). Indeed, there is a consensus on the principles of AC, which the literature categorizes as acquisition, assimilation, transformation, and exploitation capabilities (Zahra & George, 2002: 185). While no one rejects the significance of these four components of AC, most of the empirical researches to date have particularly reported at individual (Park, Suh, & Yang, 2007), business unit (Tsai,

2001), organization (Liao, Welsch, & Stoica, 2003), and cluster level (Giuliani, 2005). However, it should be noted that there is increasing attention in understanding its individual dimension because employee AC (1) plays a particular role for the improvement of an organization's AC (Cohen & Levinthal, 1990: 132), and (2) has consequences for the firm as a whole (Mu, Zhang, & MacLachlan, 2011: 32). Indeed, as Nonaka and Takeuchi (1995) emphasize, novel understandings and ideas arise from employees and not from firms.

Additionally, while previous studies typically framed definitions of AC within the context of technological knowledge (Nieto & Quevedo 2005; Haro-Dominguez, Arias-Aranda, Llorens-Montes, & Ruiz-Moreno, 2007), few studies extended the concept to different research areas and applied it on the basis of varied evaluations. Specifically, market knowledge AC is a progressive and valuable construct because market knowledge procures a complementary source of information which impacts decision making in the innovation process (Bruni & Verona, 2009: 112). Also, a successful implementation of technological knowledge is greatly connected with the market knowledge absorbed by the employees (Castillo-Jimenez & Sanchez-Perez, 2013a: 4). Therefore, firms that acquire and hold this particular type of knowledge through their employees are likely to guarantee the successful development of new products (Castillo-Jimenez & Sanchez-Perez, 2013a: 4) and to provide a timely and rapid reaction to a sharp change of market demand (Atuahene-Gima, 1995: 277).

In this respect, by integrating Zahra and George's (2002) and Castillo-Jimenez and Sanchez-Perez's (2013a, 2013b) studies, this research proposes that market knowledge AC is composed of the capacity of employees to acquire, assimilate, transform and exploit market knowledge that has been internally distributed with commercial objectives. Acquisition means the capacity of employees to recognize and acquire internally disseminated market knowledge that is vital to fulfil their job roles. Assimilation means the capacity of employees to analyze, evaluate, and understand market knowledge disseminated internally and priorly realized. Transformation implies the capacity of employees to alter and adapt newly obtained market knowledge and integrate it with current market knowledge in order to realize external opportunities and overcome external threads. Exploitation/Utilization implies the capacity of employees to apply market knowledge for commercial objectives (Castillo-Jimenez & Sanchez-Perez, 2013a: 5).

3. Hypothesis Development

3.1. Dynamic Rules of Action and Market Knowledge AC

Zahra and George (2002: 185) identify absorptive capacity as "a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic capability". However, it should be noted that the creation of such a dynamic capability depends on the employees' capacities (Cohen & Levinthal, 1990: 133) and underlying rules really changing (Winter, 2003: 993). If the underlying rules exhibit inertia, individual AC will be inadequate, learning will be slow, and thus the firm's capabilities may not be specifically dynamic (Pentland, Feldman, Becker, & Liu, 2012: 1489). In this respect, based on the study of Pentland et. al. (2012), we suggest that dynamic rules of action advance the capacity of employees to absorb market knowledge by harmonizing firm's organizational logic and activities with its employee capacity to survive and grow in a dynamic market environment (Parrish, 2010: 510). This means that when a firm faces a

hypercompetitive environment (e.g. short product life cycles short technology life cycle, frequent entry by potential entrants), its employees struggle to eliminate market-related uncertainties and lack information regarding market actors (e.g. customers, products, competitors, substitute goods, and suppliers), and thus, they need generative rules embedded in organizational structure and behaviors, enabling it to examine stocks and flows of organizational knowledge and relate these factors to market condition.

Dynamic rules of action serve as meta-routines which represent micro foundations of internal (acquisition and assimilation) and external (transformation and exploitation) AC routines (Lewin, Massini, & Peeters, 2011: 85). Internal AC meta-routines contain formal and informal organizational routines and practices regarding the management of internal variation, selection and replication processes; (1) allowing improvisation and providing the rise of novel ideas within firms; (2) selecting ideas for further improvement; (3) reflecting and updating regimes; (4) assimilating new knowledge; (5) sharing it internally and utilizing it; (6) managing adaptive tension and pacing rate of change; (7) facilitating firm integrative processes; (8) replacing old processes and activities and (9) combining new unique capabilities. In addition, the external AC meta-routines include routines to identify and recognize the value of existing and new knowledge and routines for learning from and with market actors (e.g. partner, suppliers, competitors) (Lewin et. al., 2011: 85). Consequently, dynamic rules of action built a framework to identify micro foundations of internal and external AC in the form of practiced routines. Therefore:

H1: Dynamic rules of action are positively related to employees' market knowledge AC variables.

3.2. Market Knowledge AC and Firm Innovativeness

We propose that employee market knowledge AC helps organizations to leverage their product/service and process innovativeness by (1) fostering and developing good relationships and coordinating with consumers/customers, suppliers, competitors and even potential entrants (Tsai, 2009: 767), (2) being aware of and interpreting the market value of new technological trends and knowledge (Castillo-Jimenez & Sanchez-Perez, 2013: 3), (3) detecting and resolving inconsistency between external knowledge and their internal knowledge base, (Expósito-Langa, Molina-Morales, & Capó-Vicedo, 2010: 322), and (4) intensifying the reciprocity between technological knowledge in their market environment and their previous knowledge for commercial ends (Zahra & George, 2002: 186). Therefore, employees feel free to mention market and new product and process-related opportunities and threads without being seen as unqualified and then to perform changes and overcome difficulties in better and more elegant ways with a sense of confidence.

High quality relationships with market environment is the source of stimulation for the breadth and depth of market knowledge (Day, 1994: 43), and the driver of competitive intelligence activities (Day & Nedungadi, 1994: 32). This implies that when employees, as active searcher, scan the external sources of knowledge for novel and useful ideas, they acquire knowledge of a broad variety of existing and potential customer segments (e.g. needs, desires, behaviors, properties etc.) and competitors (e.g. products/services, substitute goods, potential entrants, markets, marketing policies etc.) (Zahra, Ireland, & Hitt, 2000: 930); thus, they generate new business concepts and products (Gaglio & Katz, 2001: 106). In this sense, acquisition efforts

remove the risk of falling into trap of marketing myopia and rigidities through facilitating access to heterogeneous information and understanding of customers and competitors. To the extent that acquired market knowledge is assimilated, employees will develop a complicated comprehension of the reasonable interdependencies among customer complaints and demands, potential rival strengths and responses and firm's existing knowledge, thus increasing the possibility of the emergence of unique ideas that bring distinctive competencies (i.e. valuable, rare, inimitable and non-substitutable) to the firm, as Luca and Atuahene-Gima (2007: 98) noted. For example, because established cross-functional collaboration and logics and social linkages reduce the gap between the knowledge needed for new products-processes and the firm's available knowledge (Li & Calantone, 1998: 17), employees can (1) implement complex tasks and technical skills quickly in product innovation processes (Luca & Atuahene-Gima, 2007: 98) and (2) exploit from complementary knowledge embedded in different organizational units or departments for commercial objectives (Zahra & George, 2002: 187). In this case, through acquiring, assimilating, transforming and exploiting market knowledge, employees holding high AC are able to introduce a mass of new knowledge to innovation practices (Zahra & George, 2002: 187). Therefore;

H2: Market knowledge AC is positively related to firm innovativeness.

3.3. Product and Process Innovativeness and Financial Performance

We contend that firm's product and process innovativeness positively affects on firm performance because a firm's competitive edge is determined by competitive position of its products or services within the particular sector or market segment (Wheelen & Hunger, 2008: 183). Indeed, when a firm has the potential to lower costs and enhance differentiation through quality development efforts, product and service innovations, process improvement methods (Grant, 2005: 504), it can sustain competitive advantage (Porter, 1980: 35). For instance, even if the cost leader firm offers products and services at lower price than its competitors, it still will make a satisfactory profit. Additionally, a successful product and process differentiation through innovativeness creates brand loyalty among customers (Wheelen & Hunger, 2008: 187). In this sense, both cost leader firms and differentiated firms are likely to earn above-average returns in a specific market. Consequently, innovation activities lead to high productivity and competitiveness, thus to good export performance and thus to high profits and more investment in a cumulative cycle (Li & Calantone, 1998: 17). Therefore;

H3: Firm innovativeness is positively associated with firm performance.

3.4. Market Knowledge AC and Firm Financial Performance:

As a driving force of firm innovativeness (Mu et. al., 2011) and a part of dynamic capabilities (Zahra & George, 2002:185), employee market knowledge AC has also an impact on financial performance (Tsai, 2001: 998). However, the technology and innovation management literature shows that firms gain competitive edge and increase their financial performance by leading dynamic capabilities into the generation of new products/services, manufacturing process and production methods (Lin & Huang, 2012: 108). Kostopoulos, Papalexandris, Papachroni & Ioannou (2011: 1338) for instance assert that innovativeness is a link between increasing financial performance and AC as a dynamic capability. Rodriguez, Roldan, Montes & Millan (2014:897) regard innovativeness as the consequence of potential and realized AC. In

this regard, we propose that firm innovativeness mediates connection between the market knowledge AC and financial performance, which empirically we know little about to date. The reasonable explanation is that firm financial performance, which is generally identified by the profitability and enhancement in sales volume, market value and share, etc., is the outcome of the products and services introduced to the marketplace and the processes used in the firm's activities (Akgün, Keskin, & Byrne, 2009: 109).

The empirical researches of firm innovativeness also have shown that there is a positive and direct link between innovativeness and firm financial performance (e.g., Lööf & Heshmati, 2002; Rosenbusch, Brinckmann, & Bausch, 2011). Also, as we argued in Hypotheses 2, firm innovativeness is affected by employee market knowledge AC. More specifically, the process by which the innovative ideas for unique products, services, and business methods occur is closely associated with the AC of employees. We observe this when employees are knowledgeable to make judgment and generate and improve new ideas through the acquisition, assimilation, transformation and exploitation of market knowledge (Jimenez-Castillo & Sanchez-Perez, 2013: 4). This is specifically significant for new products, services, and processes that represent or realize the market knowledge of employees.

For example, on the basis of knowledge management literature, firms embody market-related knowledge of employees into organizational mechanisms or structures as, for instance, in design remedies, products, standard methodologies and procedures (Jansen, Bosch, & Volberda, 2005: 1004). With individual and organizational learning processes, employees share market knowledge and core capabilities and can create harmonious links, thereby, generating and remaining informal relationships for developing innovative products, services, and processes (Kohli & Jaworski, 1990: 7). Accordingly, the market knowledge AC ensures a forum for innovativeness to enhance the financial performance. Therefore;

H4: Firm innovativeness mediates the relationship between market knowledge AC and firm performance.

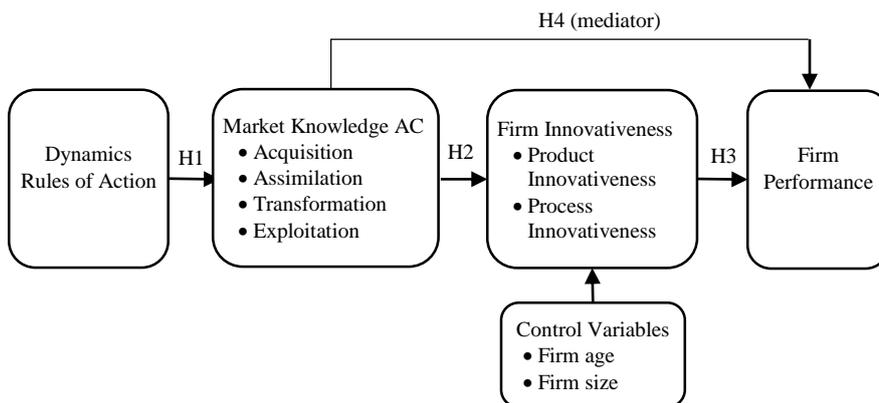


Figure 1. Research model

4. Research Design

4.1. Measures

To empirically test the research model, multi-item scales developed or adapted from previous researches were used for measurement of the variables. All variables were measured using 5-point Likert scales ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5). Firm size and age questions were assessed by a ratio scale.

For the dynamic rules of action variable, we adapted 16 question items from Akgün et al. (2014). For employee capacity to absorb new market knowledge variables, we adapted 12 question items developed by Jimenez-Castillo and Sanchez-Perez (2013b). The firm innovativeness questions were derived from Wang & Ahmed (2004). We asked nine questions for product and process innovation. To measure firm performance, seven questions were asked that were adopted from Ellinger, Ellinger, Yang, & Howton (2002) and York & Mire (2004). Although it is not the focus of our research, two variables were measured as control variables because they were argued to impact key variables in our research. Past studies showed that firm size (Rogers, 2004) and firm age (Huergo & Jaumandreu, 2004) can have significant influence on firm’s product and process innovation. Firm size was assessed by the logarithm of the number of employees, and firm age was indicated by the logarithm of the number of years since the firm was founded.

After we developed the new question items in English, following Usunier’s (2011) and Akgün, Keskin, & Byrne’s (2009) procedure, we first asked three academics from US-based universities, who each have industrial experience of at least 5 years, to ensure the face validity. They did not state any problem in understanding the items or scales. We then asked two Turkish bilingual researchers to translate the question items into Turkish and one bilingual researcher to retranslate them into English. After jointly reconciling all differences in the translations, we developed a draft questionnaire and then discussed and revised it with team members. We pretested the suitability of the Turkish version of the survey with MBA (master of business administration) students working in industry, and 8 senior employees, randomly selected from a diverse cross-section of firms located in Istanbul. Respondents did not demonstrate any difficulty in understanding the items and scales. After verifying the questionnaire items, the researchers distributed and collected the surveys, employing the ‘‘personally administrated questionnaire’’ method.

4.2. Sampling

After purifying the items for the constructs and finalizing the questionnaire, we collected data as part of the graduate marketing program in four Turkish Universities, where students were asked to distribute and collect data from their respective different firms located in the Istanbul district of Turkey. Here, we emphasized that their firms must employ more than 30 personnel and must be in business for at least five years as highlighted by Akgün et al. (2009). We then asked each student, as a contact person, to select a manager or senior employee who had been employed in different departments of the firm for at least two years to fill our questionnaire as a ‘‘key informant’’ (Kumar, Stern, & Anderson, 1993). We chose these managers and senior employees because they had a ‘‘bigger picture view’’ of the firms than other employees and were likely to evaluate the organization’s operations, employees and innovativeness more accurately, as Kumar, Stern, &

Anderson (1993) noted. In addition, selecting managers and senior employees helped us to decrease potential problems with single sourcing (Podsakoff & Organ, 1986). Also, participants had at least a college or graduate degree to be able to comprehend the question items. After qualifying the participants, we informed each that his/her answers would remain anonymous and would not be connected to them individually, nor to their firms, or products and services. In this way, we improved the willingness of respondents to collaborate without fear of potential reprisals. Next, we emphasized participants that there were no right and wrong responses and that they should respond to each question items in an honest manner. These procedures decreased the evaluation apprehension and made the subjects less likely to regulate their responses to be more socially admirable, and consistent with how they thought the researchers wanted them to answer (Podsakoff & Organ, 1986).

Of the 271 firms asked to participate, 260 agreed and completed our surveys. Since a cross-sectional research design is used in this study and independent and dependent variable questions are asked in the same survey, to check the internal validity, we asked the same questions on different pages of the questionnaire. For example, "Our employees quickly recognize shifts in the market from the information distributed to them." appeared two times each in our questionnaire. If the answers to this question items were not close to each other (our decision rule was ± 1), we eliminated that participants from the research. We discarded 19 surveys, resulting analyzable 241 firms. We matched the mean of variables, firm size, and firm age of the discarded questionnaires with the rest of the questionnaires used for the analysis and determined no statistical differences among them (Akgün et al., 2014).

In our sample, the self-reporting participants were senior employees (34%), functional managers (25%), senior engineers (24%), product or project managers (8%), general managers (5%) and president or owners of the firm (4%). The participant departments were marketing (37%), manufacturing (25%), human resources (10%), finance (8%), engineering and design (7%), and other departments (13%). The contributing sectors were finance (22%), machinery and manufacturing (16%), chemical (14%), telecommunication (13%), automotive (10%), healthcare (9%), education/consulting (% 7), information technologies (5%), insurance (% 2) and food (2%).

5. Analysis and Results

5.1. Validity and reliability

We assessed the reliability and validity of our variables performing confirmatory factor analysis (CFA) (Anderson & Gerbing, 1988; Fornell & Larcker, 1981). By employing AMOS 23.0, we analyzed all 8 variables (involving 44 question items) in one CFA model using all the questionnaires (N=241). After eliminating problematic items, which had cross loads, the resulting measurement model was determined to fit the data quite well: $\chi^2_{(601)}=1023.750$; comparative fit index (CFI)=0.93, incremental fit index (IFI)=0.93, Tucker–Lewis index (TLI)=0.92, $x^2/df=1.703$, and root-mean-square error of approximation (RMSEA)=0.05. Also, the parsimonious normed fit index (PNFI)=0.76, which is above the cutoff point of 0.70. Additionally, every item loaded significantly on their respective variables (with the lowest t-value being 2.50), providing support for convergent validity (Table 1).

Table 1. Factor Loadings

Constructs	F1	F2	F3	F4	F5	F6	F7	F8
Dyn.Rules-of- Act.								
DRA1	0.734							
DRA2	0.767							
DRA3	0.797							
DRA4	0.735							
DRA5	0.764							
DRA6	0.714							
DRA7	0.75							
DRA8	0.725							
DRA12	0.741							
DRA13	0.696							
DRA14	0.696							
DRA16	0.711							
Acquisiton								
Acq1		0.814						
Acq2		0.869						
Acq3		0.843						
Assimilation								
Ass1			0.851					
Ass2			0.782					
Ass3			0.862					
Trasformation								
Tra1				0.888				
Tra2				0.849				
Tra3				0.816				
Exploation								
Exp1					0.813			
Exp2					0.869			
Exp3					0.868			
Product Innv.								
Prd Inv.1						0.816		
Prd Inv.2						0.874		
Prd Inv.4						0.808		
Process Innv.								
Prc Inv. 1							0.668	
Prc Inv.2							0.796	
Prc Inv. 3							0.789	
Prc Inv.4							0.708	
Firm Perf.								
FP1								0.709
FP2								0.874
FP3								0.886
FP4								0.748
FP5								0.772
FP6								0.704
Fit Indexes	$\chi^2_{(601)}=1023.750$ CFI = 0.931 IFI = 0.931 TLI = 0.923 $\chi^2/df = 1.703$ RMSEA = 0.054							

To test the discriminant validity, a series of two-factor models, recommended by Bagozzi, Yi, & Philips (1991), were estimated in which single factor correlations, one by one, and were constrained to unity. The fit of the constrained models was matched with that of the unconstrained model. The chi-square change ($\Delta\chi^2$) in each model, constrained and unconstrained, were significant, $\Delta\chi^2 > 3.84$, which asserts that the measures confirm discriminant validity (Table 2).

Table 2. Discriminant analysis of the construct measures

Constructs	Unrestricted (χ^2/df)	Restricted ($\chi^2/d.f.$)	$\Delta\chi^2$
DRA (F1) vs. Acq (F2)	261.003/89	315.924/90	54.921
DRA (F1) vs. Ass F3)	241.222/89	302.280/90	61,058
DRA (F1) vs. Tra (F4)	285.109/89	349.759/90	64,65
DRA (F1) vs. Exp (F5)	254.695/89	308.957/90	54,262
DRA (F1) vs. Prd. Inv. (F6)	282.395/89	344.658/90	62,263
DRA (F1) vs. Prc. Inv. (F7)	268.007/103	337.496/104	69,489
DRA (F1) vs. Perf. (F8)	332.572/134	425.637/135	93.065
Acq (F2) vs. Ass (F3)	12.441/8	60.150/9	47.709
Acq (F2) vs. Tra (F4)	16.233/8	70.425/9	54.192
Acq (F2) vs. Exp (F5)	16.529/8	70.733/9	54.204
Acq (F2) vs. Prd. Inv. (F6)	11.998/8	78.897/9	66,899
Acq (F2) vs. Prc. Inv. (F7)	16.807/13	99.542/14	82,735
Acq (F2) vs. Perf. (F8)	70.171/26	178.113/27	107,942
Ass (F3) vs. Tra (F4)	1.970/8	59.499/9	57.529
Ass (F3) vs. Exp (F5)	12.712/8	68.783/9	56.071
Ass (F3) vs. Prd. Inv. (F6)	25.991/8	109.972/9	83.981
Ass (F3) vs. Prc. Inv. (F7)	19.078/13	110.853/14	91,775
Ass (F3) vs. Perf. (F8)	56.388/26	176.117/27	119.729
Tra (F4) vs. Exp (F5)	20.401/8	73.770/9	53.369
Tra (F4) vs. Prd. Inv. (F6)	19.551/8	106.295/9	86.744
Tra (F4) vs. Prc. Inv. (F7)	15.968/13	110.307/14	94.339
Tra (F4) vs. Perf. (F8)	63.880/26	176.646/27	112.766
Exp (F5) vs. Prd. Inv. (F6)	9.324/8	88.296/9	78.972
Exp (F5) vs. Prc. Inv. (F7)	16.488/13	104.651/14	88.163
Exp (F5) vs. Perf. (F8)	52.613/26	173.646/27	121.033
Prd.Inv.(F6) vs. Prc.Inv (F7)	62.057/13	102.555/14	40.498
Prd. Inv (F6) vs. Perf. (F8)	56.840/26	81.319/27	24.479
Prc. Inv (F7) vs. Perf. (F8)	88.997/34	150.839/35	61.842

Table 3 reports the reliabilities of the multiple-item reflective measures along with variable correlations and descriptive statistics for the scales. Table 3 also shows that all reliability estimates – involving coefficient alphas, average variance extracted (AVE) for each variable, and composite reliabilities – are close to or well beyond the threshold levels proposed by Fornell & Larcker (1981). As a control for discriminant validity, the square root of AVE for each variable was greater than the latent factor correlations between pairs of variables (see Table 3). After performing these analyzes, we concluded that our scales have enough discriminant and convergent validity.

Table 3. Correlations and Descriptive Statistics

Variables	1	2	3	4	5	6	7	8	9	10
Dyn.rules-of-action	(0.73)									
Acquisition	0.62**	(0.84)								
Assimilation	0.59**	0.67**	(0.83)							
Transformation	0.58**	0.62**	0.58**	(0.85)						
Exploitation	0.65**	0.59**	0.61**	0.65**	(0.85)					
Product Innov.	0.44**	0.37**	0.26**	0.58**	0.65**	(0.83)				
Process Innov.	0.63**	0.47**	0.42**	0.26**	0.29**	0.67**	(0.74)			
Firm Perf.	0.36**	0.23**	0.17**	0.19**	0.17**	0.58*	0.49**	(0.78)		
Firm age (log)	0.04	-0.00	-0.15*	0.02	0.00	0.21**	0.11	0.31**	-	
Firm size (log)	0.03	0.03	-0.13*	-0.01	0.03	0.17*	0.09	0.23**	0.62**	-
Mean	3.7	3.6	3.6	3.6	3.6	3.9	3.8	3.6	1.4	2.8
S.dev.	0.69	0.79	0.81	0.76	0.77	0.86	0.73	0.83	0.44	1.0
Variance extracted	0.54	0.70	0.69	0.72	0.72	0.69	0.55	0.61	NA	NA
Composite reliability	0.93	0.87	0.87	0.88	0.88	0.87	0.82	0.90	NA	NA
Cronbach's α	0.93	0.87	0.86	0.88	0.88	0.86	0.82	0.90	NA	NA

** $p < .01$, * $p < .05$. Numbers on diagonals imply square root of AVEs. NA, not applicable.

5.2. Common method variance assessment

Since the informants who answered the dependent variable also answered the independent variable, common method variance (CMV) bias may lead to inflated estimates of the relationships between the variables (Podsakoff & Organ, 1986). This problem was examined using Harman's single-factor test (Podsakoff & Organ, 1986). The results of an unrotated principal component analysis show that CMV doesn't pose a strong concern in this research because a number of factors with eigenvalue greater than 1 were determined – explaining 69.83% of the total variance – and because one general factor does not explain the majority of the shared variance (i.e., highest single variance extracted is 39.73%).

5.3. Hypothesis Testing

To analyze our hypotheses (i.e. H1, H2, and H3), we conducted structural equation modeling (SEM) analysis employing AMOS 23. Table 4 reveals that the research model sufficiently fits the data. IFI and CFI were 0.9. The ratio ($\chi^2/d.f.$), the chi-squared per degree of freedom, is 1.902 which is less than 5, suggesting a reasonable fit. The RMSEA is 0.06, very close to the threshold level of 0.05.

Table 4 asserts our findings. The table indicates that dynamic rules of action is positive related to acquisition capacity ($\beta = 0.77$, $p < 0.01$), assimilation capacity ($\beta = 0.72$, $p < 0.01$), transformation capacity ($\beta = 0.69$, $p < 0.01$), and exploitation capacity ($\beta = 0.78$, $p < 0.01$), supporting H1. For the relationship between employee market knowledge AC and firm innovativeness, the results indicate that acquisition capacity effects both product innovation ($\beta = 0.39$, $p < 0.01$) and process innovation ($\beta = 0.34$, $p < 0.01$), supporting H2a. The assimilation capacity ($\beta = 0.15$, $p < 0.1$) and exploitation capacity ($\beta = 0.23$, $p < 0.01$) affect the process innovation, partially supporting H2b and H2d. Nevertheless, the findings show that there is not any any statistical relationship between transformation capacity product innovation ($\beta = -0.08$, $p > 0.1$), and process innovation ($\beta = 0.02$, $p > 0.1$). Furthermore, we found that product innovativeness impacts the financial performance ($\beta = 0.57$, $p < 0.01$), and

process innovation influences the financial performance ($\beta = 0.14$, $p < 0.05$), supporting H3. Regarding the control variables, while firm age is positively related both to product innovation ($\beta = 0.22$, $p < 0.01$), and process innovation ($\beta = 0.11$, $p < 0.1$), firm size is not statistically significant in product innovation ($\beta = 0.04$, $p > 0.1$), and process innovation ($\beta = 0.04$, $p > 0.1$).

Table 4 . Path model.

Hypotheses	Path	Path coefficient	t-value	Result
H1	Dyn.Rules-of-Act.→ Acqu.	0.77	9.73***	Supported
	Dyn.Rules-of-Act. → Ass.	0.72	9.39***	
	Dyn.Rules-of-Act.→Trans.	0.69	9.39***	
	Dyn.Rules-of-Act.→ Expl.	0.78	9.74***	
H2	Acqu. →Prod. Innov.	0.39	4.07***	Partially supported
	Acqu →Proc. Innov.	0.34	3.58***	
	Ass. →Prod Innov.	0.06	0.68	
	Ass. →Proc Innov.	0.15	1.83*	
	Trans. → Prod. Innov.	-0.08	-1.01	
	Trans. → Proc. Innov.	0.02	0.31	
	Expl. →Prod. Innov.	0.12	1.29	
Expl. →Proc. Innov.	0.23	2.55***		
H3	Prod. Innov. → Firm Perf.	0.57	7.41***	Supported
	Proc. Innov. → Firm Perf.	0.14	2.13**	
Control Variables	Firm size→Prod. innov.	0.04	0.64	
	Firm size→Proc. innov.	0.04	0.57	
	Firm age→ Prod. innov.	0.22	2.96***	
	Firm age→ Proc. innov.	0.11	1.61*	
	$\chi^2_{(681)}=1295.384$ CFI=0.90 IFI=0.90 TLI =0.89 PNFI= 0.74 $\chi^2/df = 1.902$ RMSEA=0.06			

*p < 0.1, **p < 0.05, ***p < 0.01.

To test the mediating effect of product and process innovation between the market knowledge AC and firm performance (i.e., H4), we conducted the Baron & Kenny (1986) procedure. In this respect, we performed three different SEM models, as shown in Table 5:

- Model A, which included all the market knowledge AC variables and firm performance, shows that acquisition capacity ($\beta = 0.15$, $p < 0.05$) and transformation capacity ($\beta = 0.13$, $p < 0.1$) are positively related to firm performance, and $R^2_{perf} = 0.04$.
- Model B, covering the market knowledge AC and firm innovativeness variables, illustrates that acquisition capacity ($\beta = 0.32$, $p < 0.01$) and exploitation capacity ($\beta = 0.17$, $p < 0.1$) are positively related to product innovativeness, whereas assimilation capacity and transformation capacity are not statistically related to product innovativeness. Also, the results show that acquisition capacity ($\beta = 0.30$, $p < 0.01$), assimilation capacity ($\beta = 0.17$, $p < 0.1$) and exploitation capacity ($\beta = 0.26$, $p < 0.05$) are positively associated with process innovation, and $R^2_{prod} = 0.21$. $R^2_{proc} = 0.27$.
- After market knowledge AC variables are controlled, as shown in model C, we found that product innovativeness ($\beta = 0.56$, $p < 0.01$), and process innovativeness ($\beta = 0.26$, $p < 0.01$) are positively related to firm performance. Also, firm innovativeness reduces the effects of the market knowledge AC variables on firm performance, and the inclusion of the product and process innovativeness in the model increased the R^2 of firm performance ($R^2_{perf} = 0.39$).

Table 5. Findings of mediation analysis

Paths	Model A	Model B	Model C
Acqu. → Firm Perf.	0.15**		-0.08
Ass. → Firm Perf.	0.01		-0.01
Trans. → Firm Perf.	0.13*		0.12
Expl. → Firm Perf.	0.01		-0.15
Acqu. →Prod. Innov.		0.32***	0.33***
Acqu →Proc. Innov.		0.30***	0.30***
Ass. →Prod Innov.		0.06	0.06
Ass. →Proc Innov.		0.17*	0.17*
Trans. → Prod. Innov.		-0.08	-0.09
Trans. → Proc. Innov.		0.03	0.03
Expl. →Prod. Innov.		0.17*	0.17*
Expl. →Proc. Innov.		0.26**	0.26**
Prod. Innov. → Firm Perf.			0.56***
Proc. Innov. → Firm Perf.			0.26***
Firm size→Prod. innov.		0.04	0.04
Firm size→Proc. innov.		0.04	0.04
Firm age→ Prod. innov.		0.23***	0.25***
Firm age→ Proc. innov		0.14*	0.15*
	$\chi^2_{(129)}=520.15$ CFI:0.87 IFI:0.87 $\chi^2/df=4.035$ RMSEA:0.11	Full model	$\chi^2_{(295)}=819.189$ CFI:0.88, IFI:0.88, $\chi^2/df=2.777$ RMSEA:0.08

*p < 0.1. , **p < 0.05. , ***p|< 0.01.

Based on the above results, product and process innovativeness partially mediates the relationship between the market knowledge AC variables and firm performance, partially supporting H4.

6. Discussion and Implications

This research first empirically demonstrated one of the antecedents or drivers of AC, which improves product and process development endeavors. In particular, we showed that dynamic rules of action positively influence the form of employee market knowledge AC (acquisition, assimilation, transformation and exploitation of market knowledge). This finding expands the notion of rules of action in the conventional views, which is based on the “logic” of appropriateness or structured perspectives (Brown, Schmied, & Tarondeau, 2003), to a more dynamic and adaptive approach (Christiansen & Varnes, 2015) for managing market knowledge within firm. Also, this finding provides empirical evidence for Parrish’s (2010) case study, which underlined the role of generative rules on the sustainable development of organizations in a competitive market context. A firm’s employees market knowledge AC enhances when they successfully identify the value of market knowledge and acquire it, to further understand and assimilate, alter, adapt and transform and exploit that market knowledge through embracing the power of novelty with simple but dynamic and generative rules, their. In addition, employees produce benefit streams through the perpetuation resources following those rules, so as to use effectively market knowledge for multiple representations and commercial ends.

Second, this research investigated the role of market knowledge AC on the firm innovativeness. Previous studies, for instance, have investigated the relationship between technological knowledge absorptive capacity and (a) intra-organizational transfer of knowledge (Szulanski, 1996), (b) organizational adaptation (Jansen et. al. 2005), (c) interorganizational learning (Lane & Lubatkin, 1998), and (d) technological

acquisitions (Haro-Dominguez et al., 2007). Our results showed that, when employees recognize and acquire internally disseminated market knowledge that is vital to conduct their job roles, the firm (1) can create and offer appropriate products and services at the right time, to the right customer, in the right market and (2) can incrementally develop its business process, change its manufacturing methods, and replace its production processes. Also, when employees in the firm transmit their knowledge with each other, analyze and interpret changing market demands, understand customers' needs and wants, identify competitors' strategies, and gain suitable technology, that firm is able to develop production and business processes. In addition, when a firm and its employees use market knowledge for commercial ends, that firm improves its manufacturing methods and production techniques. These findings enhance previous studies (Chen, Lin, & Chang, 2009; Jimenez-Castillo & Sanchez-Perez, 2013a) in the literature by specifically investigating the relationship between market knowledge AC and product and process innovation.

Third, this research empirically confirmed that product and process innovativeness have explanatory power for firm financial performance. While previous studies pointed out the financial performance effects of innovativeness (Dibrell, Craig, & Neubaum, 2014), we showed, in particular, that both product and process innovativeness activities can affect firm financial performance, consistent with Akgün et al. (2009).

The implications of this research for managers and marketers are that management should employ dynamic rules of action and promote the development of a new mindset for "how to do the work" and a "can do attitude" in the organization to enhance employee market knowledge absorptive capacity, innovativeness, and firm performance. Management should realize the importance of market knowledge AC for innovativeness. Specifically, management should create influential interactions with the market environment, promote high-class relationships with other organizations (e.g. universities, governmental and non-governmental organizations, etc.), observe competitors' and potential entrants' activities, build multiple network alignments to reach different knowledge sources, and enhance tangible (e.g. plant, equipment, finances, etc.) and intangible (e.g. culture, human resources, etc.) resources in implementing mechanisms for employees to absorb new market knowledge successfully for an effective innovation process.

7. Limitations and Future Research

A number of methodological constraints are recognized in this research. Our study is prone to common method bias since in the questionnaire data for the independent and dependent variables are collected from the same informants in a cross-sectional manner. We tested this potential problem with the Harman single-factor test (Podsakoff & Organ, 1986). Although this test indicates that the existence of common method bias is negligible in this research, the problem may still appear. As with all cross-sectional study designs, the relationship investigated in this research reflects a snapshot in time. While it is likely that the conditions certain under which the data were collected will basically continue the same, there are no guarantees that this will be the case. In addition, because of the nature of the data, the generalizability of sampling is another constraint of this research. This research was performed in a particular national context, Turkish firms operating in the Istanbul district in particular; hence we are aware of the risks behind our generalization. Here it is critical

to indicate that readers should be prudent when generalizing or adapting the findings to various national contexts. In this respect, we propose that the suggested model should be applied to main industrialized centers (e.g. Detroit, Hamburg, Nankin) in the U.S., Europe or Asia and comparison studies should be carried out.

We believe that dynamic rules of action present new opportunities for future research on firm innovativeness. For instance, in this research, we examined the dynamic rules of action variable as an undimensional construct. However, in future studies, this variable could be investigated as a multidimensional construct involving the five principles mentioned above and then researchers could examine how those principles influence firm innovation activities in different environmental (e.g., environmental uncertainty, technologic and market turbulence, dynamism) and organizational (e.g., leadership and management style, organizational structure and culture) settings. Next, the concept of AC triggers new opportunities for future research. For example, future researches should be oriented to discover other organizational mechanisms that provide the improvement of market knowledge AC.

8. Conclusion

Market knowledge is part of competitive intelligence and developing an employee level of market knowledge AC is one of the dynamic capabilities of a firm. However, how market knowledge AC can be improved and its impact on a firm's product and process innovation is ignored and should be introduced to the literature. In this paper, we tested the role of market knowledge AC on firm product and process innovativeness and financial performance and the impact of dynamic rules of action on the development of employee market knowledge AC. Our findings demonstrate that market knowledge AC has an important impact on the emergence of new products, services, and processes. Additionally, our results show that dynamic rules of action impact the development of market knowledge AC. Furthermore, our findings demonstrate that market knowledge AC impacts its financial performance via firm product and process innovation performance. This research just marks the surface of this significant, yet understudied construct. Future researchers will discover investigation into dynamic rules of action and market knowledge AC to be rich and useful.

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