

# Do my competitors design my new products? : The effects of competitor's absorptive capacity

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## Abstract:

This study focuses on the transformative impacts of the interacting competitors on each other's absorptive capacity and manufacturing performance in industrial design oriented creative industries. The study examines research model with 177 innovative manufacturers who have launched creative new products by using industrial design in their new product development projects. Competitors' absorptive capacities are accepted as external knowledge sources for research firms in this paper. In this frame, external knowledge sources affect focal firms' internal abilities about processes from new product idea generation to its realization by manufacturing. Our results show that competitors' absorptive capacity as an external knowledge is a critical factor that affecting manufacturing capabilities of innovative firms and strategic moves.

**Keywords:** Absorptive Capacity, Competitor, Creative Industry, Industrial Design, Innovation, Manufacturing Performance, New Product

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## 1 INTRODUCTION

Gaining competitive advantage as economic necessity and making it sustainable are natural tasks for the innovative companies (Chen et al., 2009) in our age (Blazeska and Ristovska, 2016). Today, the increasing knowledge-based structure of competition dictates the companies to learn and develop the skills that will give them the advantage faster than their competitors (Porter, 1985; Murray and Chao, 2005). It is possible for innovative companies by using new product instrument to capture competitive advantage and maintain this advantage (Porter, 1980; Vázquez et al., 2001; MacCurtain et al., 2010; Estrada et al., 2016, Synnes and Welo, 2016). Innovation as a result of a successful new product development that enables this differentiation is the application of creative ideas provided by organizational learning (Sanchez and Mahoney, 1996). Thereby, firms are involved in a continuous learning and activity of comprehensive environmental knowledge scanning (Day, 1994; Barringer and Bluedorn, 1999; Tu et al., 2006). In this context, knowledge is widely recognized as a strategic resource and is of great value to sustain competitive advantage (Kim et al., 2013; Murray and Chao, 2005). New product development is a knowledge intensive activity that enables the transformation and commercialization of absorbed external knowledge (Cohen and Levinthal, 1990; Abecassis-Moedas and Mahmoud-Jouini, 2008; Awwad and Akroush, 2016) Thereby, absorptive capacity makes external knowledge meaningful (Lewin et al, 201; Scaringella and Burtschell, 2017). Knowledge-based organizational capabilities which enable differentiating, inimitable and advantageous features by exploiting creativity (Racela, 2014) in the new product commercialization process are the success key for many innovative companies (Kim et al., 2013; Im and Workman, 2004). Conversion of creative ideas by superior designs into innovative products (Alegrea and Chiva, 2008; Chang et al., 2014) offer new alternatives. New products of a company are results about its interaction with external environment and assimilation of new knowledge (Awwad and Akroush, 2016). It is also valid for its competitors (Campbell, 2007; Zhou, et al., 2009; Brettel and Cleven, 2011). Companies design their products through gained new knowledge (Paiva et al., 2012) and organizational learning (Olivarieta and Friedman, 2008) thanks to their absorptive capacities. For this reason, from knowledge-based approach perspective, absorptive capacity is a critical capability that provides sustainable competitive advantage. New knowledge is constantly created by an effective learning focused on customers and competitors (Tu et al., 2006). In this context, a firm's competitive performance depends on capability about knowledge creation and knowledge transfer (Rebolledo et al., 2009).

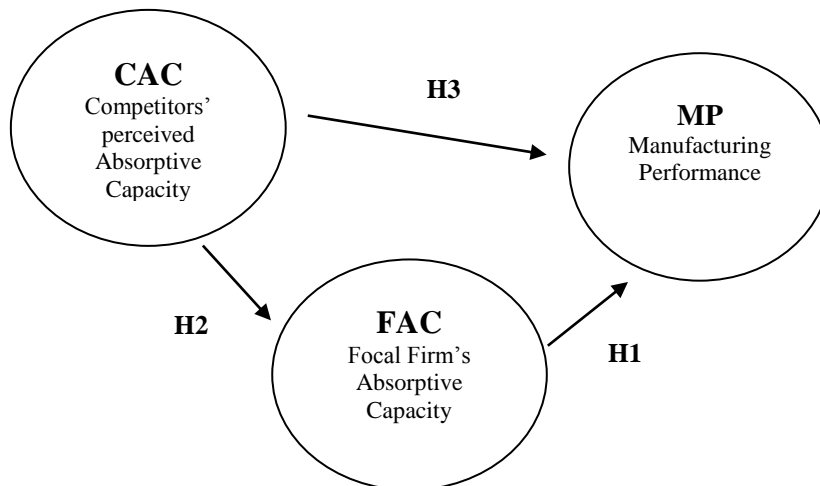
The basis of the research is the perceptual evaluation of obtained extramural knowledge regarding their competitors and capabilities (Gatignon and Xuereb, 1997; Zhou et al., 2009; Workman, 1993; Brettel and Cleven, 2011) as a result of the focal firms' environmental knowledge scanning (Spanjol et. al, 2011). Competitors also allocate knowledge-based resources (Fosfuri and Tribó, 2008) to acquire knowledge from outside world (Lichtenthaler, 2009) during their new product development process. Thereby, knowledge based capabilities of a competitor is naturally involved in the field of knowledge

retrieval of its competitors and attracts their interest (Campbell, 2007; Abecassis-Moedas and Mahmoud-Jouini, 2008). Perceptions about competitors' knowledge based capabilities (Hurmelinna-Laukkanen and Olander, 2014) can be a knowledge source in order to balance (Lieberman and Asaba, 2006; Giachetti and Lanzolla, 2016; Atuahene-Gima and Wei, 2011) rivalries (Kim et al., 2016) by developing existing capabilities for commercialization of new products. Therefore, perceptions about rival's absorptive capacity (Hurmelinna-Laukkanen and Olander, 2014) is taken into account by other competitors during their new product development process.

In this study, effects of innovative firms' perceptual knowledge about their competitors' absorptive capacity to their manufacturing capabilities of creative new products are enlightened. Thereby, from the perspective of absorptive capacity, it is evaluated that how intangible new product ideas influenced from external knowledge flow supplied by absorptive capacity and how this is reflected to manufacturing performance. This relation can be an explanatory indication of competitive success (Campbell, 2007). In other words, it is thought that the perceived absorptive capacity of the competitors in the process of developing new products (Hurmelinna-Laukkanen, and Olander, 2014) affects the absorptive capacity of perceiving companies and their new products which are manufactured under this effect. There are many studies in the literature on the transferability of knowledge and innovation that support this phenomenon (Frenz and Ietto-Gillies, 2009). As a result of knowledge transfer, before a tangible product emerges, it is thought that the perceptual presence of the competitor's capabilities has an impact on the dynamic capabilities of the focus companies and therefore on the products (Chuang, et al, 2015; Kim et al., 2016). These research questions have led to evaluation of the specific knowledge-based capabilities of innovative firms in the frame of absorptive capacity. Another research question is about manufacturability of creative ideas in design intensive creative industry. It is thought that our study also contributes to the evaluation of whether every creative new product idea can be manufacturable or not under the influence of competitors' absorptive capacities in the field of creative industry. Because, in the frame of new product development, competitive priorities which are quality, cost, flexibility and delivery speed are taken into account and creative new product ideas are transformed to tangible products adapted to these priorities. Today's competitive conditions in all sectors lead companies to develop faster and higher quality products with lower commodity prices (Serhan et al., 2015; Synnes and Welo, 2016; Blazeska and Ristovska, 2016). Therefore, companies are naturally pushed into the search for methods that take into account the competitive priorities about their manufacturing. In order to find an answer to the research questions mentioned above, this study was carried out on companies operating in design based creative industries where creative new ideas and product related innovative practices are frequently emerged by following product differentiation strategy.

**2 LITERATURE REVIEW**

In this study, the role of different disciplines involved in product development process in product design are taken into consideration (Veryzer and Borja de Mozota, 2005). In this respect, the industrial design and manufacturing processes in our model are evaluated with a holistic perspective. Differentiated product including creativity is the main driving element of a company's performance (Im and Workman, 2004). The impacts of perceived absorptive capacities of competitors on research firms' absorptive capacities and research firms' new product manufacturing performances are evaluated among companies that carry out industrial design practices in creative industries (Chuang et al., 2015).



**Figure1.** Conceptual framework

## 2.1 Absorptive Capacity and its role on the manufacturing performance of creative new products

A firm's absorptive capacity as a key competitive capability for superiority in market provides coordination of internal processes compatible with current market requirements determined by environmental turbulence. (Fernhaber and Patel, 2012). Therefore, competitive companies use their absorptive capacities to include the external knowledge to their innovative practices, which is the result of the interactions about changing market demands (Chen et al., 2009). To gain advantageous position in knowledge based competition (Fosfuri and Tribo, 2008), the absorptive capacity is an influential instrument provides a company to restructure its resources according to competitive priorities by adopting evolving innovative market requirements (Escribano et al., 2009; Duchek, 2013). Absorptive capacity is a dynamic capability that focuses on the use of external knowledge and making it penetrate into the firm (U. Lichtenthaler and E. Lichtenthaler, 2009; Chang et al., 2014; Scaringella and Burtschell, 2017). From the perspective of creative product innovation, the knowledge flow from external sources that are necessary for creativity becomes continuous thanks to absorptive capacity. Therefore, accumulated knowledge is transformed to added value and embodied in new products of the company (Chao et al., 2014). The most basic knowledge source that feeds companies to develop new products is the creative ideas (Chang et al., 2014). Therefore, the role of absorptive capacity in creative industries is much more important.

In the literature, different aspects of the absorptive capacity, which create a competitive advantage have been examined by following various authors. Cohen and Levinthal (1989) referred to the ability to create new knowledge about industrial innovation from the R&D perspective, based on the relation of absorptive capacity to learning. Then, Cohen and Levinthal (1990)'s absorptive capacity definition emerged as recognizing, assimilating and applying the new external knowledge for commercial ends which is a fundamental source for many scientific researches. Cohen and Levinthal (1994) restated the absorptive capacity with its functional feature which enables the firm to take advantage of new developments in a particular knowledge field. Zahra and George (2002) collected the previously defined functions of the absorptive capacity by Cohen and Levinthal (1990) including recognizing, assimilating and applying external knowledge under two main headings and redefined it as potential and realized absorptive capacity. Thereby, they redescribed absorptive capacity with four dimensions based on external knowledge: acquisition, assimilation, transformation and exploitation (Zahra and George 2002). Later on, potential and realized absorptive capacity were highlighted and included in various studies by many authors (Jansen et al., 2005; U. Lichtenthaler and E. Lichtenthaler, 2009; Li and Vanhaverbeke, 2009; Camison and Fores, 2010). Van den Bosch et al., (1999) highlighted efficiency, scope and flexibility of knowledge absorption on transforming of external knowledge into a commercial value by contributing to previous absorptive capacity definitions. From a different point of view, the three main components of absorptive capacity for prior knowledge, communication network and environment was put forward and emphasized by other authors (Tu et al., 2006). Lane et al. (2006) provided a description of absorptive capacity from learning perspective containing exploratory, transformative and exploitative learning processes. Thereby, absorptive capacity was described as a utilizing mechanism of external knowledge in the frame of these three learning processes (Lichtenthaler 2009). From learning perspective, the concept of learning by knowledge flow from one firm to another is considered as the essence of strategic cooperations and the definition of the absorptive capacity within this framework (Vega-Jurado et al., 2008).

From manufacturing perspective, absorptive capacity were conceptualized as operational absorptive capacity to explain the relations between absorptive capacity and the operational units of an organization (Patel et al., 2012). Thus, the firm's absorption capacity that develops its manufacturing ability indirectly also influence value for customers (Tu et al., 2006). Externally obtaining of fresh knowledge by a company conduces to the development of its existing knowledge reserve and ability to absorb (Scaringella and Burtschell, 2017). Consequently, the absorptive capacity is tightly linked to the company's existing reserve of knowledge in product or process form (Escribano et al., 2009). Knowledge develops the internal capabilities of a company. Accumulating of flowing knowledge by means of absorptive capacity contributes to innovative outputs (Murray and Chao, 2005; Paiva et al., 2012; Leal-Rodríguez et al., 2014). The fact that the raw knowledge entering into an organization is processed by the manufacturing function and converted into output is a created value. Exploitation of knowledge in manufacturing phase of new product development process is a result of an knowledge-based approach (Grant, 1996). Parallel to this fact, manufacturing and new product development performance is positively linked the cumulative knowledge stock fed by external knowledge. The essential element in the success of new product development is learning action which develops internal capabilities through absorption of outside knowledge (Cruz-González et al., 2015). Learning through absorptive capacity affects the cost-cutting efforts of firms by making process improvements (Scaringella and Burtschell, 2017). In terms of innovative practices, innovation is closely

related with manufacturing-oriented competitive priorities (speed, quality, cost efficiency, flexibility). In the context of competitive priorities, manufacturing types and innovation practices in new product development conduce to the circulation and effective use of knowledge within the organization (Koufteros and Marcoulides, 2006; Koufteros et al., 2014). Absorptive capacity increases the innovation performance of companies by improving the organizational capabilities (Chang et al., 2014). Previous researches prove that absorptive capacity is associated with not only innovation but also firm performance in positive way (Roberts, 2015). Consequently, manufacturers combine external knowledge with their existing knowledge to take advantage of transformed knowledge in the manufacturing process congruent with competitive priorities lower cost, higher speed, quality and flexibility (Abecassis-Moedas and Mahmoud-Jouini, 2008). Absorptive capacity is critical to manufactural output. Because the knowledge flow among the constituents of the manufacturing function of a firm forms necessary manufactural integration for its manufacturing practices depending on its knowledge management system (Liao and Tu, 2008). Moreover, absorptive capacity can also be developed as an accumulation of manufacturing practices (Cohen and Levinthal, 1994). Hence, an effect of the absorptive capacity on the manufacturing performance is naturally expected. Accordingly, we suggest the following hypothesis:

*Hypothesis 1 : The firm's absorptive capacity is positively related to its manufacturing performance*

## **2.2 Interaction of innovative firms' absorptive capacity with their competitors' perceived absorptive capacity**

Firms that scan knowledge about their competitors want to be aware of their competitors' future plans and their capabilities developed in this direction. Thereby, they access knowledge about their competitors' strengths and weaknesses. Each competitive and innovative competitor operating within each other's knowledge scanning area is an external source of knowledge that allows comparison of the capabilities of each other (Campbell, 2007). Therefore, companies who want to take advantageous position in competition naturally want to know current competitive priorities of their own capabilities and to know and try to perceive the capabilities of their competitors in order to develop by comparing themselves with their competitors. (Moorman 1998). In this context, it is assumed that innovation applications of companies which perceive whether their competitors' ability to absorb is high or low will be different (Hurmelinna-Laukkanen and Olander 2014). Knowledge about changes in a competitor's new product actions about customer preferences is in coverage zone of another competitive company's knowledge scanning. Therefore, being aware of these changes and interpreting them are the basic underpinnings of the appropriate responses to the environment (Gaur et al., 2011). Broadly knowledge scanning causing company success is the company's key capability to monitor its internal and external environment (Tu et al., 2006). Screening for external knowledge is an important underpinning of the absorptive capacity (U. Lichtenthaler and E. Lichtenthaler, 2009). There is a knowledge based relationship between companies implementing innovation and acquiring each other's knowledge. Because, each company is naturally an external source of knowledge for the other and each company is situated within the scope of each other's knowledge browsing. In addition, successful firms are known to scan much wider than failed firms (Tu et al., 2006). It is stated that the resources and developed capabilities of competitors to obtain external knowledge in the new product development process are led to a benchmarking of the efforts of other innovative companies to develop their own resource use and capabilities (Campbell, 2007). The results of this benchmarking lead to range of behaviours from developing innovative products to imitating the competitor's products to neutralize their threatening actions (Chuang et al., 2015; Giachetti and Lanzolla, 2016). Disabling competitive moves of competitors that would constitute a threat in the environment of uncertainty are among the firm's priorities (Lieberman and Asaba, 2006). Firms can recognize their competitors when they have knowledge about their competitors' products and road map. Therefore, a firm's accumulated knowledge about its competitors is a result of efforts of regularly investigating of this type of knowledge (Atuahene-Gima and Wei 2011). Balancing the direct and indirect effects of competitors, analysing of competitors' capabilities, developing competitive advantages and anticipating competitors' responses requires a strong competitive orientation (Gatignon and Xuereb, 1997). Therefore, captured signals of competitors are taken into consideration in actions of innovative firms about their new product development (Im and Workman, 2004). In addition, competitive behaving firms can identify their own advantages and disadvantages by absorbing knowledge of their competitors in order to determine competitive threshold as a reference point. According to this reference point, when competitor-oriented firms understand competitors' strengths and weaknesses and their own one, they can internalize strong capabilities of their competitors to weaken them (Li and Calantone, 1998; Zhou et al., 2009). Firms can absorb spillovers of extramural knowledge from their competitors and their practices (Volberda et al., 2010).

Competitive businesses want to quickly balance their competitors' new product marketing initiatives by following their competitors closely. Hence, they can tend to take advantage of

competitors' absorptive capacity by collaboration (Emden et al., 2006). Thus, they try to understand the profiles of both current and potential competitors along with their long-term capabilities and strategies. (Zhou et al., 2009). In this study, the capability of competitors monitored by innovative firms are taken into consideration as the absorptive capacity. Internalizing of competitors' absorptive capacity as a strong capability is difficult. Because knowledge on this capability can be considered as tacit knowledge. In addition, it is difficult to understand the tacit knowledge and adapt it to another organizational structure for exploiting internalized capability sourcing from this type of knowledge (Bierly III et al., 2009). In this respect, the tacit knowledge that constitutes the absorptive capacity of a firm provides a continuous competitive advantage (Rebolledo et al., 2009). However, transfer of knowledge among competing firms is also easy because they can have equivalent knowledge processing structure related to their absorptive capacities (Jimenez-Barrionuevo et al., 2011). Thereby, competing firms tend to embrace knowledge from each other about capabilities that contribute to the development of their own capabilities (Campbell, 2007). In this sense, competing firms can take advantage of each others' resources in addition to their own resources by means of collaboration (Emden et al., 2006). Thereby, it is possible to collaborate on absorptive capacity among competing firms. Consequently, the lack of absorptive capacity of innovative firms can push them into a cooperation to benefit from the absorptive capacity of other firms and exploit (Emden et al., 2006). Furthermore, the easiest and cost-effective way to internalize the strengths of the competitors is to emulate their behavior and capabilities (Zhou et al., 2005). Benchmarking is a knowledge source providing valuable knowledge about innovative firms' own capabilities and their competitors when competitors are accepted as a reference point. Hence, it is thought that the perceived absorptive capacity of competitors during the new product development process of focal firms influences the absorptive capacities of the focus firms and this perceptual effect naturally influences the new product development process of the focus firm (Hurmelinna-Laukkanen and Olander 2014). The key assumption in the model is the interaction between focal innovating firms' absorptive capacity and their competitors' absorptive capacity. Thereby, absorption of competitors' absorptive capacity as an external knowledge source by focal firms is the core of the assumption. We focus on the innovative firms and their competitors' relationship from the standpoint of absorptive capacity in industrial design oriented creative industry. On the other hand, transfer of knowledge between competitors can be easier because of the awareness about each other's actions (Roberts, 2015). It is also easier to absorb knowledge in the competitive relationship of firms with similar operational structures in a similar market. For this reason, knowledge affinity enhances the ability to absorb. Firms in competition increase each other's absorptive capacity due to their knowledge affinity (Lane and Lubtakin, 1998, Roberts, 2015). Thus, we suggest the following hypothesis:

*Hypothesis 2 : The firm's absorptive capacity is positively associated with its competitor's perceived absorptive capacity*

### **2.3 The effects of competitors' perceived absorptive capacity on manufacturing performance of innovative firms**

Firms maintain or increase their competitiveness by increasing their performances. A firm's performance is evaluated by considering three main measurements that profitability, growth and manufacturing performance are accepted to be performance indicators of the firm (Choe et al., 1997). Accordingly, increasing manufacturing performance increases the business performance. Consequently, manufacturing performance is closely related to the business performance and the competitiveness in positive way (Leachman et al., 2005). Except for growth and profitability, manufacturing performance covering sub-dimensions described as four competitive priorities is used in the measurement for firm performance. These are cost efficiency, product quality, manufacturing flexibility and delivery speed (Choe et al., 1997). For this reason, manufacturers seek to catch the best performance in competitive priorities (Vickery, 1991; Sarmiento et al., 2007). Speed, quality, flexibility and cost which are sub-dimensions of manufacturing performance are closely related to new product development operations. Many previous empirical evidences support the idea that operational performance such as manufacturing performance objectives increases firm performance by taking these competitive priorities into consideration (Vickery, 1991; Subedi, 2004; Robertson et al., 2012). A competitive manufacturing requires having a number of unique and advantageous manufacturing skills compared to the firm's competitors (Vickery, 1991).

From the perspective of organizational learning and operational efficiency relationships, increasing performance in innovation applications leads to increasing operational speed and quality as well as enhancing organizational learning (Koufteros and Marcoulides, 2006). In terms of resource based approach, firms trying to adapt to changing external conditions have to use their resources to develop both new products and manufacturing processes (Mahmood et al., 2011). Competitive priorities are in line with the strategy of diversification. Therefore, the competitive climate requires taking into account various competitive factors simultaneously for innovative firms (Serhan et al., 2015). In terms of

manufacturing competency of firms, design and manufacturing of new products can be accomplished by bringing together different skills according to the manufacturing strategy covering widely accepted four competitive priorities (Subedi, 2004). For this purpose, one of the most critical skills to be brought together with other skills is absorptive capacity. Manufacturing is under the pressure of managing knowledge flow that leads to improving its existing knowledge absorption capabilities (Paiva, et al., 2012). It is possible to improve absorptive capacity through being mingled with manufacturing operations (Cohen and Levinthal, 1990). Namely, a firm involved in manufacturing activities can better identify and exploit the new knowledge about related manufactured products on the market. Consequently, it has a more advanced absorptive capacity. Learning and absorptive capacity play a positive role in achieving performance goals for competitive priorities. It is possible for firms to achieve these goals through making non-reactive, future-oriented, opportunity focusing moves by maximally taking advantage of external knowledge sourcing from high absorptive capacity (Cohen and Levinthal, 1990). Learning through absorptive capacity affects the cost-cutting efforts of firms by making process improvements, thus affecting the new product development performance (Scaringella and Burtschell, 2017). Campbell (2007) finds that absorptive capacity is in a positive association with firm performance. Firms that manage the knowledge flow by absorbing external knowledge needed for manufacturing flexibility can gain better performance (Patel et al., 2012). The firms combine design and technical knowledge externally acquired through absorptive capacity with their related previous knowledge to improve new product development performance in accordance with time, cost and product quality of competitive priorities (Abecassis-Moedas and Mahmoud-Jouini, 2008).

When competitors learn about each other's non-tangible resources like absorptive capacity, it may lead to the use of this knowledge as a weapon to weaken each other's innovation and manufacturing performance. (Hurmelinna-Laukkanen and Olander, 2014). From a success-centred point of view, achieving success in innovative product development practices by combining the resources to be obtained from competitors may require cooperation with competitors (Estrada et al., 2016). Competitor oriented firms respond to their competitors with innovative actions by using their own resources in accordance with the knowledge they obtain from their competitors. (Wong and Tong, 2012). Constantly monitoring the developments related to competitors can also cause designing of different products comparing to competitors as another competitive move. Hence, it is possible to cooperate with competitors by using complementary knowledge obtained from competitors in the new product development process. This knowledge-based collaboration enables the company to develop its own capabilities (Li and Vanhaverbeke, 2009; Estrada et al., 2016). The innovative activities of the competing firms are natural external threats to each other. Competitive firms try to improve the performance of their existing products to respond to each other's threatening innovative moves (Kim et al., 2016). The fact that competitors have a high absorptive capacity in terms of innovative firms is accompanied by the risk of losing knowledge-based resources and investments of innovative firms. Thereby, firms with this perception can not want to invest in innovation. Consequently, the perception of the innovative firm about their competitors' absorptive capacity influences the innovative firm's innovation practices. (Hurmelinna-Laukkanen and Olander, 2014). The perception that innovative firms have about current situation of their competitors' absorptive capacity affects their innovation practices. When firms have a perception in respect of rivals' high absorptive capacity are forced themselves to become more innovative (Hurmelinna-Laukkanen and Olander, 2014). According to this perception, innovative activities can be limited or expanded. As a result of responsive decision of an innovative firm, imitations, incremental and radical innovations can be emerged (Hurmelinna-Laukkanen and Olander, 2014). Consequently, competitive knowledge regarding the actions of competitors shapes competitive behaviors (Peyrot et al., 1996, 2002). As an example of various responsive behaviors, it is possible to reduce the time and costs for new product development processes among competing companies during their collaborations by developing internal capabilities and speeding up the development (Brettel and Cleven, 2011). Competitive pressure created by innovative products of competitors stimulates competing firms to defeat each other by using similar tools (Khin et al., 2012). As another behavior type, firms can imitate their competitors to keep their competition balance (Giachetti and Lanzolla, 2016). It is also assumed that companies with weak capacity to absorb compared to their competitors are prone to risk aversion by relying on their competitors' knowledge and skills or avoiding radical innovation practices. Therefore, they are inclined to practice incremental innovation and even to imitate their competitors (Zhou et al., 2005; Campbell, 2007). However, in the opposite case, the focal innovative companies are assumed to be more willing to put new products into the market. Perception of an innovative company about its competitors (Moorman, 1998; Campbell 2007; Atuahene-Gima and Wei, 2011) and their absorptive capacity as critical competence (Hurmelinna-Laukkanen and Olander, 2014) leads to its various responsive applications ranging from radical/ incremental innovation to imitation (Day, 1994). We focus on the effects of innovative firms' absorptive capacities and their competitors' absorptive capacities on research firms' manufacturing performance in industrial design oriented creative industry. Therefore,

perceived absorptive capabilities of the competitors can effect on the innovative firm's manufacturing capability and its innovation applications. This hypothesis is evaluated with the findings of the research. For this reason, following hypothesis is congruent with our research questions.

*Hypothesis 3 : The competitor's perceived absorptive capacity by the firm is positively associated with its manufacturing performance.*

### 3 METHODOLOGY

#### 3.1 Sample and Data Collection

In light of theoretical background, a survey was carried out on creative industry firms which manufactured creative new products and followed product differentiation strategy by using industrial design in last three years.

In this respect, the study was conducted on the various manufacturing firms who participated in the "Design Turkey" industrial design award program organized 4 times between 2008 – 2014 where new product development efforts and innovative products were evaluated in the industrial design field. "Design Turkey" is held every two years from 2008 with the supports of Industrial Designers' Society of Turkey, Republic of Turkey Ministry of Economy and Turkish Exporters Assembly. Main purpose of this program is evaluation and rewarding of innovative products creatively designed in order to reveal and encourage various value-added and competitive new product development approaches by using creative power of industrial design (Design Turkey).

**Table 1.** Sectorel ratios.

Business Sector	Number of Firms	Rate
Packaging and Fast Consumer Goods	20	11%
Lighting	9	5%
Electronics	15	8%
Home Appliances & Personal Care	12	7%
Haousehold Furniture	12	7%
Home &Office Accessories	11	6%
Public Domain Products	5	3%
Office Furniture	14	8%
Sports, Hobby, Games, Toys and Children's Products	14	8%
Medical Devices and Supplies	5	3%
Vehicles and Vehicle Accessories	23	13%
Vitrified Products and Building Components	20	11%
Investment Products and Construction Equipment	17	10%
<b>Total</b>	<b>177</b>	<b>100%</b>

The primary data was collected from "Design Turkey" directory for testing through electronically questionnaire. The questionnaire is translated from English into Turkish and tested on trial group with 33 participants to reduce concern regarding the face validity of measures. In addition, interviews with academicians from various universities and managers from various related industrial design oriented sectors were conducted to confirm the conformity and accuracy of the items present in the research questionnaire. Thereby, content and face validity of the measures was ensured. The e-mails including links of the questionnaire were sent to the top managers, marketing and product design managers of 386 firms for data collection. 177 utilizable filled questionnaires were collected. Questionnaire response rate is 45,85%. The responding firms belong to Packaging and Fast Consumer Goods, Lighting, Electronics, Home Appliances&Personal Care, Household Furniture, Home&Office Accessories, Public Domain Products, Office Furniture, Sports, Hobby, Games, Toys and Children's Products, Medical Devices and Supplies, Vehicles and Vehicle Accessories, Vitrified Products and Building Components, Investment Products and Construction Equipment. These sectors are classified by the World Design Organization (WDO), formerly the International Council of Societies of Industrial Design (ICSID). (Table 1)

#### 3.2 Measures

This article is focused on absorptive capacity definition which is the composition of the following basic functions: acquisition, assimilation, transformation and exploitation of knowledge (Zahra and George, 2002). Acquisition represents the phase of identifying and obtaining of external knowledge. Thereby, it is valuable for the firms' internal manufacturing processes in product innovation.

Assimilation process covers analysing and ability of deep insight of the acquired knowledge. Transformation is the phase of merging of the obtained external knowledge with the existing prior knowledge. Exploitation is the phase of using transformed knowledge in operational targets (Zahra and George, 2002, Todorova and Durisin, 2007). This set of capabilities extracts useful and advantageous knowledge congruent with competitive business strategy. It is critical for organizational targets such as determined manufacturing performance. Consequently, the research focal firms' the absorptive capacity and the their competitors' perceived absorptive capacity are built on the absorptive capacity definition of Zahra and George (2002).

This study mainly used existing scales taken from the literature. The following questionnaire constructs were used. The measurement items of research (focal) firms' absorptive capacity (FAC) are adapted from previous study of Flatten et al., (2011). 4 dimensions and 13 items were conceptualized for FAC and a five-point Likert scale was used for the measurement. The measurement items of competitors' perceived absorptive capacity (CAC) are adapted from previous studies of Hurmelinna-Laukkanen and Olander (2014) and Flatten et al., (2011). 4 dimensions and 13 items were conceptualized for CAC and a five-point Likert scale was used for the measurement. (FAC) and (CAC) measurements include dimensions of acquisition, assimilation, transformation and exploitation.

Quality, cost, delivery speed and flexibility as the most well-known competitive priorities in many studies are notified. While the concept of quality refers to the superiority of a product relative to its competitors, the concept of speed refers to how fast a tangible new product which is transformed from the idea of a new product, reaches the market (Rodríguez-Pinto, et al., 2011). While cost is defined as an output of manufacturing, flexibility is considered as manufacturing capacity (Swink and Hegarty, 1998). The close relationship between manufacturing performance and competitive priorities has been addressed in many studies. Therefore, competitive priorities about cost, quality, delivery speed and flexibility are taken into consideration in our article. The measurement items of Manufacturing Performance (MP) are adapted from Liao et al., (2010). MP measurement includes dimensions of cost, quality, flexibility and delivery speed. 4 dimensions and 20 items were conceptualized for MP and five-point Likert scale was used for the measurement.

### 3.3 Analyses and results

#### 3.3.1 Data Analyses

PLS (partial least squares) which is a structural equation modeling was used as a statistical method to test the hypotheses. PLS was preferred because of the small size of the sample and the nature of the predicted relationships among the variables (Roldán and Sánchez-Franco, 2012). The statistical analysis was carried out in two stages which cover assessment of the reliability/validity of the measurement model and assessment of the structural model.

It was determined that statistical necessities for the measurement model were met. The fact that the standardized loadings of the measurement items are greater than 0.6 (Table 2) and the composite reliabilities are greater than 0.7 (Table 3) proves it. Also, AVE (average variance extracted) values are greater than 0.5 (Table 3). It is determined that the constructs are reliable (Fornell and Larcker, 1981). In addition, confirmative outcomes for discriminant validity are got as a result of comparison of square root of AVE with correlations among all variables.

**Table 2:** Factor loadings

Items	CAC	FAC	NPMP
CACAC2	0,780680		
CACAC3	0,814923		
CACAS1	0,871341		
CACAS2	0,845344		
CACAS3	0,858333		
CACAS4	0,862071		
CACEX1	0,776236		
CACEX2	0,806321		
CACEX3	0,789099		
CACTR1	0,845223		
CACTR2	0,837542		
CACTR3	0,861635		
CACTR4	0,818336		



Items	CAC	FAC	NPMP
FACAS1		0,786111	
FACAS2		0,652486	
FACAS3		0,648395	
FACAS4		0,771544	
FACEX1		0,702412	
FACEX2		0,618912	
FACEX3		0,616283	
FACTR1		0,746874	
FACTR2		0,782089	
FACTR3		0,756652	
FACTR4		0,686476	
FAFAC2		0,637406	
FAFAC3		0,687864	
MPC3			0,699021
MPF1			0,687357
MPF2			0,693512
MPF3			0,688519
MPF4			0,646732
MPF5			0,617311
MPF6			0,699890
MPF7			0,718826
MPQ1			0,767083
MPQ2			0,721824
MPQ3			0,716593
MPQ4			0,741455
MPQ5			0,690130
MPQ6			0,751563
MPT1			0,738560
MPT2			0,754625
MPT3			0,721470
MPT4			0,776481
MPT5			0,728477
MPT6			0,674516

All relevant values about internal consistency, convergent and discriminant validity for the constructs are shown in (Table 3), according to the results of the statistical analysis.

**Table 3.** Internal consistency, convergent and discriminant validity for constructs

Latent Construct	Comp. Reliability	Cronbach's Alpha	AVE	CAC	FAC	NPMP
<b>CAC</b>	0,966089	0,962158	0,686973	<b>0,828</b>		
<b>FAC</b>	0,926172	0,913221	0,512949	0,467247	<b>,716</b>	
<b>MP</b>	0,953682	0,948782	0,507993	0,422219	0,614723	<b>,712</b>

on the diagonal are the square roots of AVE in bold font and in the lower right triangle are the correlations among latent constructs in italic font.

3.3.2 Results

PLS analysis results as the explained variance of the endogenous variables ( $R^2$ ) as well as the path coefficients ( $\beta$ ) are shown in Figure 2. Relations among the variables are meaningful. The hypotheses are supported. At the evaluation stage of the structural model,  $R^2$  values and structural path coefficients are taken into account.

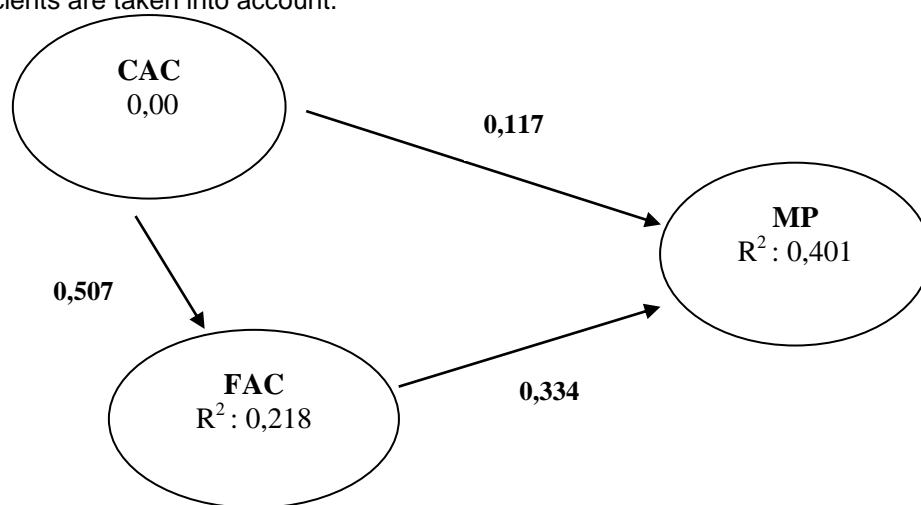


Figure 2. Estimated causal relationship

The model statistics, the path coefficients and the t values are displayed in Table 4.

Table 4. Model statistics

Hypothesis	Path coefficients	Standard error	t values	$R^2$
H1: FAC → MP	0,334338*	0,083609	2,065504	0,40
H2: CAC → FAC	0,507942*	0,082283	5,678554	0,21
H3: CAC → MP	0,117533*	0,090230	5,918560	0,40

\*P<0.05

FAC is positively associated with MP ( $\beta$ : 0,334,  $p<0.05$ ). Research firms' absorptive capacity has direct effect on their new product manufacturing performance. Therefore, H1 is supported. CAC is positively associated with FAC ( $\beta$ : 0,507,  $p<0.05$ ). Competitors' perceived absorptive capacity has direct effect on focal firms' absorptive capacity. Therefore, H2 is supported. CAC is positively associated with MP ( $\beta$ : 0,117,  $p<0.05$ ). Competitors' perceived absorptive capacity has direct effect on focal firms' new product manufacturing performance. Therefore, H3 is supported.

4 DISCUSSION AND CONCLUSION

In this article, we tried to evaluate the impacts of competitors' capabilities on creative new products of innovative firms they interacted, as well as their impact on the operational capabilities of innovative firms. The effects of absorptive capacities (intangible knowledge based resources) belonging to research firms and their competitors on research firms' new product manufacturing performance are evaluated. There is an assessment is undertaken on this issue in the field of industrial design based creative industry in Turkey. Furthermore, unlike previous studies, this study focused on not only absorptive capacity of the innovative firms but also the absorptive capacity of their competitors.

Findings support that even before a tangible product emerges, the perceptual presence of the competitors' absorptive capacities affects the manufacturing capabilities of the focal firms and hence their products. Our research questions have led to an evaluation of the knowledge-based capabilities of competing innovative companies. In other words, it is found that the competitors' perceived absorptive capacities by research firms in product development process influence each other's absorptive capacities and this perceptual effect naturally influences their new products. It is possible that the manufacturing processes of innovative firms are shaped under this influence and they put their new products on the market accordingly. For this reason, competitors absorptive capacity which have

not been addressed so much in previous studies should also be taken into account in the context of the interaction and innovation practices of competing firms regarding gaining competitive advantage.

From design and creative industry perspective, design may require difficult operations in terms of manufacturing practices. Therefore, the design should be carried out in accordance with the manufacturing capability and goals compromising with manufacturing. The design has to take into account the perspectives of related disciplines such as manufacturing as well as the creative perspective it has (Wuest et al., 2015). Therefore, designed products must be manufacturable. Thus, the concept of design for manufacturing covers evaluating of the sub-components of product design in terms of number and ease of manufacturing (Tarasewich, 1996). Manufacturability timely meets customer demands by delegation of responsibility to design, manufacturing and delivery functions (Doll et al., 2010). Manufacturability is concerned with lowering costs as well as increasing product quality (Doll et al., 2010). It is reasonable to think that the development state of absorption capacity of a firm compared to their competitors' is influential in manufacturability. In this context, firms can show two reactive approaches, "me" or "second-but-better" (Frambacha et al., 2003). Thereby, competing firms can tend to become followers by imitating their competitors' product innovation. (Chao et al., 2014; Chuang et al., 2015; Song, 2015).

Learning through absorptive capacity about the nature and content of competitors' activities helps new product project members better understand the technology and product-oriented solution trends in the industry. Indirect learning involves the analysis of competitors' innovative activities and products in the new product development process of firms (Laursen and Salter, 2014). Managers need to consider the absorptive capacities of competitors when allocating resource for their own absorptive capacity. In addition, managers should consider competitive role of industrial design and manufacturability in new product development process and plan manufacturing process in line with competitive priorities. In this context, companies should not only rely on their own external networks, but also develop their absorptive capabilities (Matthyssens et al., 2005) to efficiently evaluate and internalize extramural knowledge sourcing from competitors' absorptive capacity. Firms need to improve their ability to scan and find out beneficial external knowledge for their operational processes. In similar vein, manufacturing companies in creative industries are in need of benefiting from external knowledge by establishing a communication network with the external partners enabling creative new ideas that are transformed into new products. Therefore, manufacturers have to absorb released knowledge in the network to develop new products on a commercial basis (Chang et al., 2014). Accordingly, absorptive capacity of competitors is critical in comparing, internalizing and developing of firm's own absorptive capacity. Usage of absorbing capability by innovative firms enables capturing their competitors' signals and exploiting them to a commercial end (Cohen and Levinthal, 1990). Hence, a higher absorptive capacity can provide much superior innovation performance (Chang et al., 2014). Within the framework of the relationship between absorptive capacity and new product development, companies need to effectively implement internal and external learning activities (Cruz-González et al., 2015). Higher or lower absorptive capacity affects the outputs of knowledge oriented businesses. Hence, development status of absorptive capacity is a determiner in mental business design, operational methods and innovative practices (Larraneta et al., 2012). We hope that relevant researchers will consider relationship between manufacturing and competitors' absorptive capacity in the frame of creative new product perspective.

#### REFERENCES

- Abecassis-Moedas C, Mahmoud-Jouini S.B. (2008) "Absorptive capacity and source-recipient complementarity in designing new products: an empirically derived framework", *The Journal of Product Innovation Management* 25: 473–490.
- Alegrea J, Chiva R. (2008) "Assessing the impact of organizational learning capability on product innovation performance: an empirical test". *Technovation* 28: 315–326.
- Atuahene-Gima K, Wei Y. (2011) "The vital role of problem-solving competence in new product success". *The Journal of Product Innovation Management* 28: 81–98.
- Awad A, Akroush MN. (2016) "New product development performance success measures: an exploratory research". *EuroMed Journal of Business* 11(1): 2-29.
- Barringer BR, Bluedorn AC. (1999) "The relationship between corporate entrepreneurship and strategic management". *Strategic Management Journal* 20: 421–444.
- Bierly III PE, Damanpour F, Santoro MD. (2009) "The application of external knowledge: organizational conditions for exploration and exploitation". *Journal of Management Studies* 46(3): 481-509.
- Blazeska D, Ristovska N. (2016) "The product design as a significant element of differentiation for achieving market competitiveness". *Economic Development* 1-2: 41-58.
- Brettel M, Clevn NJ. (2011) "Innovation culture, collaboration with external partners and NPD performance". *Creativity and Innovation Management* 20(4): 253- 272.
- Camisón C, Forés B. (2010) "Knowledge absorptive capacity: new insights for its conceptualization and measurement". *Journal of Business Research* 63: 707–715.

- Campbell DA. (2007) "Competitive absorptive capacity: antecedents and performance implications". The University of Mississippi, ProQuest Dissertations Publishing.
- Chang CH, Chen YS, Lin MJJ. (2014) "Determinants of absorptive capacity: contrasting manufacturing vs services enterprises", *R&D Management* 44(5): 466-483.
- Chao MCH, Feng S, Li F. (2014) "The journey from market orientation to new product performance in the host country: a knowledge and learning perspective". *Journal of Marketing Development and Competitiveness* 8(1): 62-73.
- Chen YS, Lin MJJ, Chang CH. (2009) "The positive effects of relationship learning and absorptive capacity on innovation performance and competitive advantage in industrial markets". *Industrial Marketing Management* 38: 152-158.
- Choe K, Booth D, Hu M. (1997) "Production competence and its impact on business performance". *Journal of Manufacturing Systems* 16(6): 409-421.
- Chuang FM, Morgan RE, Robson MJ. (2015) "Customer and competitor insights, new product development competence, and new product creativity: differential, integrative, and substitution effects". *The Journal of Product Innovation Management* 32(2): 175-182.
- Cohen WM, Levinthal DA. (1989) "Innovation and learning: the two faces of R&D". *The Economic Journal* 99: 569-596.
- Cohen WM, Levinthal DA. (1990) "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly* 35: 128-152.
- Cohen WM, Levinthal DA. (1994) "Fortune favors the prepared firm". *Management Science* 40(2): 227-251.
- Cruz-González J, López-Sáez P, Navas-López JE, Delgado-Verde M. (2015) "Open search strategies and firm performance: the different moderating role of technological environmental dynamism". *Technovation* 35: 32-45.
- Day GS. (1994) "Continuous learning about markets". *California Management Review* 36(4): 9-31.
- Design Turkey. Available at: <https://www.designturkey.org.tr/about/what-is-design-turkey> (accessed 18 January 2017).
- Doll WJ, Hong P, Nahm, A. (2010) "Antecedents and outcomes of manufacturability in integrated product development". *International Journal of Operations & Production Management* 30(8): 821-852.
- Duchek S. (2013) "Capturing absorptive capacity: a critical review and future prospects". *Schmalenbach Business Review* 65: 312-329.
- Emden Z, Calantone RJ, Droge C. (2006) "Collaborating for new product development: selecting the partner with maximum potential to create value". *The Journal of Product Innovation Management* 23: 330-341.
- Escribano A, Fosfuri A, Tribó JA. (2009) "Managing external knowledge flows: the moderating role of absorptive capacity". *Research Policy* 38: 96-105.
- Estrada I, Faems D, Faria P. (2016) "Coopetition and product innovation performance: the role of internal knowledge sharing mechanisms and formal knowledge protection mechanisms". *Industrial Marketing Management* 53: 56-65.
- Fernhaber SA, Patel PC. (2012) "How do young firms manage product portfolio complexity? the role of absorptive capacity and ambidexterity". *Strategic Management Journal* 33: 1516-1539.
- Flatten TC, Engelen A, Zahra SA, Brettel M. (2011) "Measure of absorptive capacity: scale development and validation". *European Management Journal* 29: 98-116.
- Fornell C, Larcker DF. (1981) "Evaluating structural equation models with unobservable variables and measurement error". *Journal of Marketing Research* 18: 39-50.
- Fosfuri A, Tribó JA. (2008) "Exploring the antecedents of potential absorptive capacity and impact on innovation performance". *Omega* 36: 173-187.
- Frambacha RT, Prabhub J, Verhallen T.M.M. (2003) "The influence of business strategy on new product activity: The role of market orientation". *International Journal of Research in Marketing* 20: 377-397.
- Gatignon H, Xuereb JM. (1997) "Strategic Orientation of the firm and new product performance". *Journal of Marketing Research* 34: 77-90.
- Gaur SS, Vasudevan H, Gaur AS. (2011) "Market orientation and manufacturing performance of Indian SMEs moderating role of firm resources and environmental factors". *European Journal of Marketing* 45(7/8): 1172-1193.
- Giachetti C, Lanzolla G. (2016) "Product technology imitation over the product diffusion cycle: which companies and product innovations do competitors imitate more quickly?" *Long Range Planning* 49: 250-264.
- Grant RM. (1996) "Toward a knowledge-based theory of the firm" *Strategic Management Journal* 17: 109-122.
- Hurmelinna-Laukkanen P, Olander H. (2014) "Coping with rivals' absorptive capacity in innovation activities". *Technovation* 34: 3-11.
- Im S, Workman Jr JP. (2004) "Market orientation, creativity, and new product performance in high-technology firms". *Journal of Marketing* 68: 114-132.
- Jansen JJP, Van den Bosch FAJ, Volberda HW. (2005) "Managing potential and realized absorptive capacity: how do organizational antecedents matter?" *Academy of Management Journal* 48(6): 999-1015.
- Jimenez-Barrionuevo MM, Garcia-Morales VJ, Molina LM. (2011) "Validation of an instrument to measure absorptive capacity". *Technovation* 31: 190-202.
- Khin S, Ahmad NH, Ramayah T. (2012) "The integrated effect of strategic orientations on product innovativeness: moderating role of strategic flexibility". *Procedia - Social and Behavioral Sciences* 65: 743 - 748.

- Kim B, Kim E, Foss, NJ. (2016) "Balancing absorptive capacity and inbound open innovation for sustained innovative performance: an attention-based view". *European Management Journal* 34 (1): 80-90.
- Kim N, Im, S, Slater SF. (2013) "Impact of knowledge type and strategic orientation on new product creativity and advantage in high-technology firms". *The Journal of Product Innovation Management* 30(1): 136–153.
- Koufteros X, Marcoulides GA. (2006) "Product development practices and performance: a structural equation modeling-based multi-group analysis". *International Journal of Production Economics* 103: 286–307.
- Koufteros X, Lu G, Peters RC, Lai K, Wong CWY, Cheng TCE. (2014) "Product development practices, manufacturing practices and performance: a mediational perspective". *International Journal of Production Economics* 156: 83–97.
- Lane PJ, Koka BR, Pathak S. (2006) "The reification of absorptive capacity: a critical review and rejuvenation of the construct". *Academy of Management Review* 31(4): 833–863.
- Lane PJ, Lubatkin M. (1998) "Relative Absorptive capacity and interorganizational learning". *Strategic Management Journal* 19: 461–477.
- Larrañeta B, Zahra SA, González JLG. (2012) "Enriching strategic variety in new ventures through external knowledge". *Journal of Business Venturing* 27(4): 401-413.
- Laursen K, Salter AJ. (2014) "The paradox of openness: appropriability, external search and collaboration". *Research Policy* 43: 867–878.
- Leachman C, Pegels CC, Shin SK. (2005) "Manufacturing performance: evaluation and determinants". *International Journal of Operations & Production Management* 25(9): 851-874.
- Leal-Rodríguez AL, Ariza-Montes JA, Roldán JL, Leal-Millán A.G. (2014) "Absorptive capacity, innovation and cultural barriers: a conditional mediation model". *Journal of Business Research* 67: 763–768.
- Lewin AY, Massini S, Peeters C. (2011) "Microfoundations of internal and external absorptive capacity routines". *Organization Science* 22(1): 81–98.
- Li T, Calantone R.J. (1998) "The impact of market knowledge competence on new product advantage: conceptualization and empirical examination". *Journal of Marketing* 62(4): 13-29.
- Li Y, Vanhaverbeke W. (2009) "The relationships between foreign competition, absorptive capacity and pioneering innovation: an empirical investigation in Canada". *International Journal of Innovation Management* 13(1): 105–137.
- Liao K, Tu, Q. (2008) "Leveraging automation and integration to improve manufacturing performance under uncertainty: an empirical study". *Journal of Manufacturing Technology Management* 19(1): 38-51.
- Liao K, Tu Q, Marsillac E. (2010) "The role of modularity and integration in enhancing manufacturing performance: an absorptive capacity perspective". *Journal of Manufacturing Technology Management* 21(7): 818-838.
- Lichtenthaler U. (2009) "Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes". *Academy of Management Journal* 52(4): 822–846.
- Lichtenthaler U, Lichtenthaler E. (2009) "A capability-based framework for open innovation: complementing absorptive capacity". *Journal of Management Studies* 46(8): 1315- 1338.
- Lieberman MB, Asaba S. (2006) "Why do firms imitate each other? " *The Academy of Management Review* 31(2): 366-385.
- MacCurtain S, Flood PC, Ramamoorthy N, West MA, Dawson JF. (2010) "The top management team, reflexivity, knowledge sharing and new product performance: a study of the Irish software industry". *Creativity and Innovation Management* 19(3): 219-232.
- Mahmood IP, Zhu H, Zajac EJ. (2011) "Where can capabilities come from? network ties and capability acquisition in business groups". *Strategic Management Journal* 32: 820-848.
- Matthyssens P, Pauwels P, Vandenbempt K. (2005) "Strategic flexibility, rigidity and barriers to the development of absorptive capacity in business markets: themes and research perspectives". *Industrial Marketing Management* 34: 547 – 554.
- Moorman C. (1998) "Market-level effects of information competitive responses and consumer dynamics". *Journal of Marketing Research* 35(1): 82-98.
- Murray JY, Chao MCH. (2005) "A cross-team framework of international knowledge acquisition on new product development capabilities and new product market performance". *Journal of International Marketing* 13(3): 54–78.
- Olavarrieta S, Friedmann R. (2008) "Market orientation, knowledge-related resources and firm performance". *Journal of Business Research* 61(6): 623- 630.
- Paiva EL, Gutierrez ER, Roth A.V. (2012) "Manufacturing strategy process and organizational knowledge: a cross-country analysis". *Journal of Knowledge Management* 16(2): 302-328.
- Patel PC, Terjesen S, Li D. (2012) "Enhancing effects of manufacturing flexibility through operational absorptive capacity and operational ambidexterity". *Journal of Operations Management* 30: 201–220.
- Peyrot M, Van Doren, D, Allen K, Childs, N. (1996) "Competitor intelligence among industrial wholesalers: An exploratory study". *The Journal of Marketing Management* 50(1): 46-60.
- Peyrot M, Childs N, Van Doren D, Allen K. (2002) "An empirically based model of competitor intelligence use". *Journal of Business Research* 55: 747-758.
- Porter ME. (1980) "Competitive strategy: Techniques for analyzing industries and competitors". Free Press: New York.
- Porter ME. (1985) "Competitive advantage: Creating and sustaining superior performance". Free Press: New York.

- Racela OC. (2014) "Customer orientation, innovation competencies, and firm performance: a proposed conceptual model". *Social and Behavioral Sciences* 148: 16 – 23.
- Rebolledo C, Halley A, Nagati H. (2009) "The effects of absorptive capacity on operational performance within the context of customer- supplier relationships". *Supply Chain Forum: An International Journal* 10(2): 52-62.
- Roberts N. (2015) "Absorptive capacity, organizational antecedents, and environmental dynamism". *Journal of Business Research* 68,:2426–2433.
- Robertson PL, Casali GL, Jacobson D. (2012) "Managing open incremental process innovation: absorptive capacity and distributed learning". *Research Policy* 41: 822– 832.
- Rodríguez-Pinto J, Carbonell P, Rodríguez-Escudero AI. (2011) "Speed or quality? how the order of market entry influences the relationship between market orientation and new product performance". *International Journal of Research in Marketing* 28: 145–154.
- Roldán JL, Sánchez-Franco MJ. (2012) "Variance-based structural equation modelling: guidelines for using partial least squares in information systems research. In M. Mora (Eds.), *Research methodologies, innovations and philosophies in software systems engineering and information systems.* " Hershey PA: IGI Global 193–221.
- Sanchez R, Mahoney JT. (1996) "Modularity, flexibility, and knowledge management in product and organization design." *Strategic Management Journal* 17: 63-76.
- Sarmiento R, Byrne M, Contreras LR, Rich N. (2007) "Delivery reliability, manufacturing capabilities and new models of manufacturing efficiency". *Journal of Manufacturing Technology Management* 18(4): 367-386.
- Serhan YNA, Julian CC, Ahmed ZU. (2015) "Using time to gain competitive advantage: a framework and analysis of proposition" *International Journal of Commerce and Management* 25(4): 456-465.
- Scaringella L, Burtschell F. (2017) "The challenges of radical innovation in Iran: knowledge transfer and absorptive capacity highlights -Evidence from a joint venture in the construction sector". *Technological Forecasting & Social Change* 122: 151–169.
- Song ZH. (2015) "Organizational learning, absorptive capacity, imitation and innovation empirical analyses of 115 firms across China". *Chinese Management Studies* 9(1): 97-113.
- Spanjol J, Qualls WJ, Rosa JA. (2011) "How many and what kind? the role of strategic orientation in new product ideation". *The Journal of Product Innovation Management* 28, 236–250.
- Subedi DK. (2004) "Effect of manufacturing and information processing competences on realized strategy and performance". The University of Toledo, ProQuest Dissertations Publishing.
- Synnes EL, Welo T. (2016) "Enhancing integrative capabilities through lean product and process development". *Procedia CIRP* 54: 221–226.
- Swink M, Hegarty WH. (1998) "Core manufacturing capabilities and their links to product differentiation". *International Journal of Operations & Production Management* 18(4): 374-396.
- Tarasewich P. (1996) "Design for success". *Industrial Management* 38(2): 28-32.
- Todorova G, Durisin, B., (2007) "Absorptive capacity: valuing a reconceptualization". *Academy of Management Review* 32(3): 774–786.
- Tu Q, Vonderembse MA, Ragu-Nathan TS, Sharkey TW. (2006) "Absorptive capacity: enhancing the assimilation of time-based manufacturing practices". *Journal of Operations Management* 24: 692–710.
- Van den Bosch FA, Volberda HW, de Boer M. (1999) "Coevolution of firm absorptive capacity and knowledge environment: organizational forms and combinative capabilities". *Organization Science* 10(5): 551-568.
- Vázquez R, Santos M, Álvarez LI. (2001) "Market orientation, innovation and competitive strategies in industrial firms". *Journal of Strategic Marketing* 9: 69–90.
- Vega-Jurado J, Gutiérrez-Gracia A, Fernández-de-Lucio I. (2008) "Analyzing the determinants of firm's absorptive capacity: beyond R&D". *R&D Management* 38(4): 392-405.
- Veryzer RW, Borja de Mozota B. (2005) "The impact of user-oriented design on new product development: an examination of fundamental relationships". *The Journal of Product Innovation Management* 22: 128–143.
- Vickery SK. (1991) "A theory of production competence revisited". *Decision Sciences* 22(3): 635-643.
- Volberda HW, Foss NJ, Lyles MA. (2010) "Absorbing the concept of absorptive capacity: how to realize its potential in the organization field". *Organization Science* 21(4): 931–951.
- Wong SKS, Tong C. (2012) "The influence of market orientation on new product success". *European Journal of Innovation Management* 15(1): 99-121.
- Wuest T, Liu A, Wei W, Lu SCY, Thoben KD. (2015) "Utilization of state drivers to support design for manufacturing". *Procedia CIRP* 36: 72–77.
- Zahra SA, George G. (2002) "Absorptive capacity: a review, reconceptualization and extension". *Academy of Management Review* 17(2): 185-203.
- Zhou KZ, CK, Yim Tse DK. (2005) "The effects of strategic orientations on technology- and market-based breakthrough innovations". *Journal of Marketing* 69: 42–60.
- Zhou KZ, Brown JR, Dev CS. (2009) "Market orientation, competitive advantage, and performance: a demand-based perspective". *Journal of Business Research* 62(11): 1063-1070.