

Exploitative Innovation and the Impact of Realized Absorptive Capability and Technology Orientation

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Abstract

This paper aims to identify the impact of Technology Orientation on the relationship of Realized Absorptive Capability and Exploitative Innovation. Using a sample of 194 firms located in Albania, we empirically test the mediating role of Technology Orientation. Nowadays, Innovation is not anymore a new phenomenon. In the literature a lot of studies have seen it with a close connection to technology. In some other study, in case of a dynamic environment, firms with realized absorptive capability are more predisposed to absorb technology and to be able to be update with it. Since technology is considered as an auxiliary tool to innovation, we considered it specifically for exploitative innovation which can increase even the efficiency of firms. The focus of this study is placed on knowledge-intensive sector in order to better capture the effect of these variables. The results demonstrate that the Technology Orientation has a full mediating role on this relationship. The Realized Absorptive Capability has not any impact on Exploitative Innovation in case of the lack of Technology Orientation.

Keywords: Realized Absorptive Capability, Technology Orientation, Exploitative Innovation, Albanian firms, Knowledge based industry.

Introduction

The business environment has become increasingly sophisticated and restricted. Therefore, it is complicated, given the fast changes in business environment nowadays, for an organization to create all the required knowledge to obtain the required innovation. One of the earliest authors that has write about innovation is Schumpeter (1934), he referees to it as a new combination of existing resources. As pointed out by Teece (2007), resource-based theory laid the micro foundations of the necessary skills to maintain firms' superior performance in a dynamic environment with high innovation. In the same line (Hu, 2014) determines that a higher organizational ability to acquire and utilize new information leads to a higher capacity to launch innovations.

There is no doubt that the importance of innovation is directly related to performance as Drucker (1985) describe the innovation leads to changes that creates a new dimension of

performance. So, most of the literature that investigate on innovation concepts and its role in firms' success, gives an importance role of innovation and frequently cites it as the key element of superior firm performance (Han, Kim, & Srivastava, 1998; Hurley & Hult, 1998; Weerawardena, O'Cass, & Julian, 2006).

Content details

Previous literature classified the innovation along two dimensions: (1) degree of novelty of new or existing technologies, products, and services that firms introduce into market before their own competitors (it may have already been available in other markets); and (2) degree of novelty of new or existing technologies, products, and services that firms introduce, but are already available from competitors in firms' market (Popadić M., Černe, M., 2016). This can also be associated also to the concept of incremental and radical innovations (L.A.G. Oerlemans et al, 2013).

Among the literature on innovation an important role was given to the concept of exploratory and exploitative innovation. The notion of exploratory and exploitative innovation is seen as continuum of the concept of exploration and exploitation (Popadić M., Černe, M., 2016). March (1991) introduced the two concepts as follows: exploration includes things captured by terms such as search, variation, risk taking, experimentation, flexibility, discovery, and innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, and execution. The concept of exploration–exploitation is scarce with respect to technological innovations and thus is needed. In past, exploration–exploitation was linked through mergers and acquisitions, alliances, and other strategic changes (Lavie & Rosenkopf, 2006), with little attention given to the innovations (Greve, 2007).

Popadić et al. in their paper in 2016 made a clear distinguish between exploration and exploitation in innovation context. In doing so, they considered exploration and exploitation as outcomes of innovation, and exploratory innovation was seen as synonymous with radical innovation, while exploitative innovation with incremental innovation. Exploratory innovations are radical innovations because they are designed to meet the needs of new markets (Benner & Tushman, 2003; Danneels, 2002). For example, development of a distribution channel that is new to the market is a form of exploratory innovation. In turn, exploitative innovations are incremental innovations and designed to serve existing markets (Benner & Tushman, 2003). For instance, improving the efficiency of existing distribution channels is a form of exploitative innovations.

Exploratory innovations require development of new knowledge (Benner & Tushman, 2002). They enable firms to scan a variety of opportunities from the environment and create capabilities that are necessary for long-term survival and prosperity (Uotila, Maula, Keil, & Zahra, 2009). Moreover, exploratory innovation transposes in new processes, products, or markets (Lumpkin & Dess, 1996). In turn, the goal of exploitative innovation is to build a firm's current competitive advantage by efficiently managing the firm's existing resources, skills, and capabilities to improve the designs of current products and services or to strengthen current customer relationships (Lubatkin et al., 2006; Sirén, Kohtamäki, & Kuckertz, 2012). So, through exploitation, firms learn how to exploit existing technologies while through exploration, firms are more focus to experiment, and innovate (Levinthal and March, 1993; Jansen et al., 2006). In some study both exploratory innovation and exploitative innovation have a positive effect

on firm performance for example, this is found at (Jansen et al, 2006; Li et al., 2008; Rothaermel and Alexandre, 2009; Junni et al., 2013).

According to previous studies in this field, many internal factors facilitate exploratory innovation and exploitative innovation. The main that can be mentioned are the Absorptive capacity (AC) in its two dimensions' potential absorptive capacity and realized absorptive capacity and the third variable Technological innovation (Mikhailov, A., & Reichert, F. M. 2019). Considering Teece (2010) the technological development is the key of success to captured customer needs as well as the value creation, if a new product or service is implemented in a firm, so in a dynamic environment this factor is very related with innovation. AC and innovation studies show that AC positively affects innovative performance. Cohen and Levinthal (1990, p. 128) define AC as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends". They stated that research and development (R&D) spillovers can increase the firms' ability to identify, assimilate and exploit knowledge from the environment. While Zahra and George (2002) provided another turn to the definition, they are separating the AC structure into two main dimensions: potential absorptive capacity (PACAP) and realized absorptive capacity (RACAP).

PACAP includes the acquisition and assimilation capabilities. It makes the firm open to the acquisition and assimilation of externally-generated knowledge (Lane and Lubatkin, 1998). On the other hand, RACAP involves the transformation and exploitation capabilities discussed earlier. It reflects the firm's capacity to leverage the knowledge that has been absorbed.

Based on Jansen et al., 2006 the absorptive capacity begins with knowledge acquisition from the environment and ends with its exploitation. Even if PACAP and RACAP have different roles, yet their effect is not isolated, but rather complementary. Both subsets of absorptive capacity coexist and participate in the improvement of firm performance. Firms cannot possibly exploit knowledge without first acquiring it. Similarly, firms can acquire and assimilate knowledge but might not have the capability of transforming and exploiting this knowledge for profit generation. Therefore, a high PACAP does not necessarily imply enhanced performance. RACAP involves transforming and exploiting the assimilated knowledge by incorporating it into the firm's operation (A.L. Leal-Rodríguez et al, 2014).

The focus of our study is the exploitative innovation as Albania's firm are much more oriented in incremental innovations based on the reason that the firms on this developing county don't have the possibility to change rapidly the technology and to develop the exploratory innovation but they are more focused to implement new technology and new process that requires their market, so they are investing in existing needs customers or markets, current and existing distribution channels. We want to investigate the impact of realized absorptive capability on Exploitative innovation. In addition, this study sheds light on the mediating role of technology oriented on Exploitative innovation.

Hence, we pose the hypotheses and theoretical model as below:

H1. There is a significant relationship on Realized Absorptive Capability and Exploitative Innovation.

H2. There is a significant relationship between Realized Absorptive Capability and Technological Orientation

H3. Realized Absorptive Capability and Technology Orientation both impact positively Exploitative Innovation

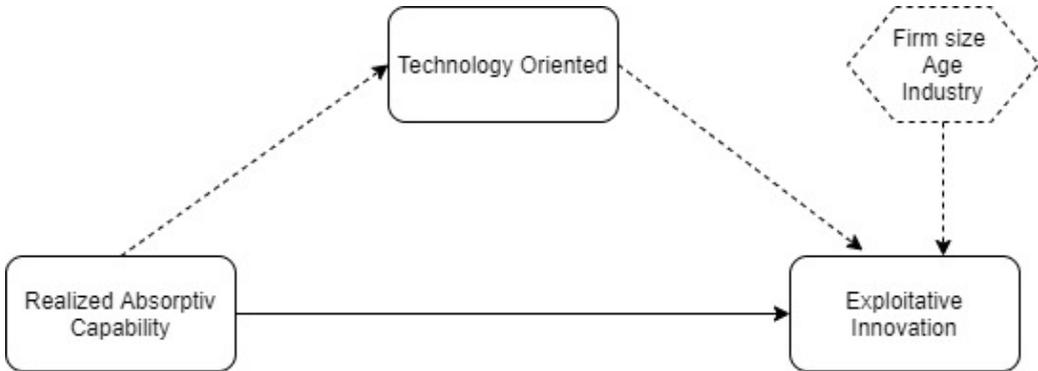


Fig 1: Theoretical structure model

Method and procedures

The sample in this study consists of 203 firms randomly selected from a defined framework of companies registered in the national business center in Albania on 2018. This framework was focused only on intensive knowledge sectors. According to the definition of the Eurostat on NACE Rev.2 the sample has considered nine different subsectors in manufacturing and services. The main reason for selecting only the intensive knowledge sectors was to capture the phenomenon under investigation about innovation (Von Nordenflycht, 2010). As Ashworth (2012) and Morollon, Loscos and Pardos (2010) explain the firms with high concentration of knowledge, information, technology and skills are more adapted to supplying solutions on a dynamic environment. Based on Bayesian outlier we removed nine cases, so the final analyze is made for 194 businesses. The most data are taken directly by the owners, administrators or firms managers, when we have been explained all the questions face by face. The Statistical Package for Social Sciences (SPSS) version 20 was used to analyze the data.

Dependent variable

Exploitative Innovation based on (Jansen et al. 2006) is measured on four questions with seven-point scale, related only with the new product and services. The manager was asked to rate if their firms refine the provision of existing products and services; if they implement regularly small adoptions to existing products and services; if they introduce improved, but existing products and services for the local market and if the organization expands services for existing clients. The four-item construct yielded a Cronbach Alpha of 0.752 (standardized Cronbach Alpha coefficients), follows thin accordance with the recommended criteria (Nunnally,1978) and (Hair et al., 2006) show that coefficients of 0.7 or more are considered adequate.

Independent variable

Realized Absorptive Capacity is operationalized on six items based on (Camisón & Forés, 2010; Flatten et al., 2011). The six items generate a Cronbach Alpha of 0.855 that is a very good

indicator for the construct. The firm managers have been asked to measure the items from 1 (if they were strongly disagreeing) to 7 (if they were strongly agreeing). They are asked for: 1. The ability that their employees have to structure and use newly collected information, 2. If the employees are used to preparing newly collected information for further purposes and making it available, 3. Are they able to integrate new information into their work; 4. Do they have immediate access to stored information, e.g. about new or changed guidelines or instructions; 5. Are they regularly engage in the development of prototypes or new concepts; and 6 do they apply new knowledge in the workplace to respond quickly to environment changes.

Mediated variable

Technology orientation is the independent variable that we have operationalized based on Zhou et al (2005). The three items that are used for this construct are based on the activity that firms are using. So the managers had value the: 1. the use of the most advanced technology in the development of new products; 2. Easy acceptance by the organization of technological innovation which is undertaken based on concrete results of a research work and 3. Technological innovation is easily accepted in the management of specific projects undertaken in the organization. The items generate a Cronbach Alpha of 0.742 that is a good indicator according to (Hair et al., 2006).

Control Variable:

Manufacture or service – this variable is measured as a dichotomy variable, the business are divided on service and manufacturing based on classification of NACE2.

Age - is the number of the years that the business has on the market.

Size of business – is measured by the logarithm of the employees that has the business.

Empirical model

Following Baron and Kenny (1986), a system of three equations is used to assess the mediational role of realized absorptive capability:

$$1) Y = \beta_{10} + \beta_{11}X + e_1$$

$$2) Me = \beta_{20} + \beta_{21}X + e_2$$

$$3) Y = \beta_{30} + \beta_{31}X + \beta_{32}Me + e_3$$

Where, in this article Y is the dependent variable representing – firm's performance, X is the independent variable – the technology orientation and Me is the mediator variable-realized absorptive capability.

Construct validity

To analyze the items that are used in the questionnaire we performed a factor analysis with varimax rotation (see appendix A). To test the validity of our independent perceptual variables is used KMO and Bartlett's Test that is significant and has an adequacy measured of Sampling 0.783. The two components accounted 61.89% of the variance and loadings are above the acceptable standard of 0.32 proposed by Tabachnick and Fidell (2007).

The results for Technology Orientation loaded reasonably high, exactly (.633, .860, .890). Also four the construct of Realized Absorptive Capability the items reasonable high (.843, .776,

.871, .759, .785, .835). About the Exploitative innovation the items loaded also high (.852, .610, .800, .774).

Results

We have considered only 194 business after we have eliminated the outlier. The respondents on this study were the owners, administrators or managers of the business where 35.1% of the respondents were female and 64.9% were male. Around 80% of business were located on Tirana, the capital city of Albania, and the other businesses were located in Durres that is also a city with a lot of businesses because of the impact that has the location of port in this city. In Albania, based on Instat (2020) around 41% of the businesses are located inside of this two cities. Most of the businesses interviewd are service focused and only 28.4% are manufacturing businesses. Even if the sample is randomly selected, the representation of the population is at a good level, referring to the age and division into production and service according to Eurostat (Nace2), as shown in the table below:

Table 4: Comparison in % between Sample and Campion

	Based on NACE2 (%)		Age (%)						
	Manufacture	Service	1-5 year	6-10 year	11-15 year	16-20 year	21-25 year	26-30 year	Over 30 years
Sample (194)	28.4	71.6	32.1	25.2	16.8	11.8	10.1	2.5	1.5
Campion (3493)	29.3	70.7	23.11	23.11	18.09	16.08	13.06	5.05	1.5

Sobel test is performed to see the significant of the mediation effect on this equation. Based on the value of skewness and kurtosis the variable define as a normal distribution. The value of VIF are greater than one so this indicate a lack of multicollarity. The following tables summarizes all the regression results for the three hypotheses:

Table 5: Regression results for H1 and H2

Variable	Dependent variable: Exploratory Innovation H1			Dependent variable: Technology Orientation H2		
	B	S.E	Beta	B	S.E	Beta
Constant	4.792***	.417		3.575***	.442	
Realized Absorptive Capability	.186*	.072	.182	.331***	.077	.297
R Square	.033			.088		
Adjusting R Square	.028			.084		
F	6.609			18.613		

*0.01 ≤ p < 0.05, **p < 0.01, ***p < 0.001, †0.05 ≤ p < 0.1

Table 6: Regression results for H3

	Dependent variable: Exploitative Innovation H3		
	(RealizAC-TO-EXIn)	(RealCA-TO-EXIn)	(RealCA-TO-EXIn)

Variable	B	S.E	Beta	B	S.E	Beta	B	S.E	Beta
<i>Constant</i>	3.694** *	.45 7		3.627** *	.45 5		3.360** *	.54 2	
<i>Realized Absorptive Capability</i>	.084	.07 2	.083	.060	.07 2	.059	.052	.07 5	.051
<i>Technology Orientation</i>	.307***	.06 4	.336	.304***	.06 4	.332	.314***	.06 4	.348
<i>Industry (service/manufacture)</i>				.310†	.16 3	.129	.373*	.16 9	.157
<i>Firm Size</i>							.070	.05 3	.099
<i>Age</i>							-.002	.00 9	- .015
<i>R Square</i>	.136				.152		.169		
<i>Adjusting R Square</i>	.127				.139		.146		
<i>F</i>	15.042				11.361		7.219		

*0.01 ≤ p < 0.05, **p < 0.01, ***p < 0.001, †0.05 ≤ p < 0.1

Hypothesis 1: Realized Absorptive Capability has a positive impact on Exploitative Innovation. The R-square indicates that around 3.3% of the variance variable can be explained in this model.

Hypothesis 2: Realized Absorptive Capability has a significant positive impact on Technological Orientation. The R-square in this model indicate that around 8.8% of the variance can be explained in this model.

Hypothesis 3: In the model that we can see both Realized Absorptive Capability and Technology Orientation, they don't have both significant impact on Exploitative Innovation. Only the Technology Orientation has a significant positive impact on Exploitative Innovation. The R-square in this model indicate that around 15.2% of the variance can be explained in this model.

Based on (Baron and Kenny, 1986) as it is a significant relationship between the Realized Absorptive Capability on Exploitative Innovation (equation 1) and there is a significant relationship between Realized Absorptive Capability to the Technology Orientation (equation 2) we come to the conclusion that Technology Orientation is a complete mediator in this relation because the effect of the independent variable (Realized Absorptive Capability) is not significant on the Exploitative Innovation (equation 3) when is taken in consideration also Technology Orientation.

Conclusions

Our study aims to investigate the relationship between realized absorptive capability and exploitative innovation in 194 firms focused on knowledge intensive sector on Albania. As well known in many studies. technology is often seen as the main input of innovation or even as an essential element to make it successful. At the same time, as it is emphasized by the resource based theory, the firm cannot gain sustainable competitive advantages without dynamic capabilities in such a dynamic environment. Viewing the technology orientation as an important variable on innovation this study has concluded that no matter how important realized absorptive capability is, they cannot be transferred their potential to exploitative innovation without the mediation role of technology. So, based on this empirical study, the firms that follow the market and also tend to be innovative must be conscious that the main

element on this process is the access of technology or how they are oriented on technology to achieve their goals. Also the study has managerial implication, they should know that no matter how many resources and potential a firm has, if technological orientation is lacking the resources may be left unused.

Limitation

No studies come without limitations, so some limitations of our research should be noted. One of the limitations of the study is related to innovation, our study includes only exploitative innovation and does not include the explorative innovation. Another limitation of this study is the lack of other variable that explain exploitative innovation. Finally, in the future study more data are needed to ensure that the captured effect is the same.

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Appendix A: Factor Analysis with Varimax Rotation

Items for independent variable	Factor*		
	F1	F2	F3
We frequently refine the provision of existing products and services	.000	.852	.152
We regularly implement small adoptions to existing products and services	.084	.610	.334
We introduce improved, but existing products and services for our local market	.114	.800	.051
Our organization expands services for existing clients	.052	.774	.123
We use sophisticated technology in developing new products	.112	.322	.633
Technological innovation which is undertaken based on concrete results of a research work, is easily accepted in our organization	.218	.187	.860
Technological innovation is easily accepted in the management of specific projects undertaken in organizations.	.221	.090	.890
The employs have the ability to structure and use newly collected information	.843	.057	.096
The employs are used to preparing newly collected information for further purposes and making it available	.776	.057	.088
The employs are able to integrate new information into their work	.871	.053	.096
The employs have immediate access to stored information, e.g. about new or changed guidelines or instructions	.759	.105	.115
The employs regularly engage in the development of prototypes or new concepts	.785	.044	.188
The employs apply new knowledge in the workplace to respond quickly to environment changes	.835	.049	.217

*Underlying the dimension as three factor: F1- Realized Absorptive Capability; F2-Exploitative Innovation; F3- Technology Orientation