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## Analyzing the Factors Affecting the Export Performance of Medical Devices Manufacturers in Egypt

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### Abstract:

*Medical devices industry pivotal role in healthcare, emergency responses, and public health infrastructure. Additionally, export performance and its determinant has been widely studied in the literature with focus on both internal and external factors affecting export performance.*

*Despite the significant presence of medical devices manufacturers in Egypt who export their products globally, the literature has largely overlooked the export dynamics within this sector in developing countries. This study aims to bridge this gap by examining the factors affecting export performance of medical devices manufacturers in Egypt. Employing a survey methodology, data was collected from 93 managers across the industry. The analysis revealed a statistically significant positive impact of entrepreneur orientation, Marketing capabilities, relationship quality and export market orientation on export performance of Egyptian manufacturers of medical devices. These insights not only offer a roadmap for manufacturers aiming to enhance global competitiveness but also assist policymakers in crafting supportive political, financial, and trade policies. Moreover, the methodology and results presented here provide a foundation for future research into the export activities of different industries within Egypt.*

**Keywords:** *Medical devices, Export Performance, Entrepreneur orientation, Marketing capabilities, Relationship quality, Export market orientation.*

### 1-Introduction

Medical devices are instruments, machines and reagents intended to be used for a medical purpose. According to the World Health Organization (WHO), there are two million kinds of medical devices worldwide that are crucial for health coverages, emergencies, and public health. (WHO, 2022). In July 2022, the Export Council for Medical Industries indicated that Egypt's export of medical and pharmaceutical industries increased from 345 million USD in 2021 to 450 million USD in 2022 with a 30% improvement. (Export Council for Medical Industries, 2022)

The Egyptian Medical supplies market is the 5th largest in the MENA region. This sector in Egypt has evolved over the last 15 years and obtained certifications such as European CE and USA FDA for the export purpose. Furthermore, there are several advantages for using Egypt as a hub for export and investments such as strategic location, relationship with African countries and lower overheads compared to European and American manufacturers.

(Export Council for Medical Industries, 2022).

### Problem statement

Export activity is a traditional and classical method for companies to grow strategically and financially. Globalization and exportation help organizations to find new opportunities and to compete globally outside their limited domestic market. (Navarro-García, Peris-Oritz and Barrera-Barrera, 2016; Chen, Sousa and He, 2016; Piñera-Salmerón, Sanz-Valle, and Jiménez-Jiménez, 2023). Export performance and its determinants has been studied extensively in the literature. Different studies summarized internal and external factors affecting export performance in the manufacturing, industry, and service sectors (Chen, Sousa, and He, 2016; Sousa, Martínez-López and Coelho, 2008). However, export performance of medical devices manufacturing sector which is a crucial sector for the public and person health was never the focus in the literature and previous studies. Additionally, despite having studies focusing on export performance in countries having similarities to Egypt such as Algeria (Haddoud et al., 2018), The literature didn't focus on the export performance of Egyptian exporters.

Focusing on the factors affecting export performance, entrepreneur orientation is a strategic practice that aims to achieve different organizational objectives (Covin and Wales, 2011). The impact of entrepreneur orientation on export performance was extensively studied in the literature. Many studies suggested a positive impact of entrepreneur orientation with the dimensions of innovation, risk taking and proactiveness on export performance (Hossain et al., 2022; Li, Wei and Liu, 2010; Karami and Tang, 2019; Hizarci et al., 2022). On the other side, contradictory results were observed in other studies claiming a negative, nonlinear, or non-significant relationship between the entrepreneur orientation and export performance (Boso et al., 2013; Dai et al., 2013; Felzensztein et al., 2015; Renko, Carsrud, and Brännback, 2009). Accordingly, it is clear that there is no scientific international agreement on the influence of entrepreneurial orientation and its dimensions on export performance.

According to the recent studies in literature, there is a positive impact of different dimensions of marketing capabilities, such as pricing, distribution, communication, and product development on export performance of different organizations. (Zou, Fang and Zhao, 2003; Haddoud et al. 2018; , Pham, Monkhouse, and Barnes, 2017). This impact was indirect in some studies (Kayabaşı and Mtetwa, 2016) and was dependent on the type of products in other studies (Al Aali et al., 2013). Similar results were observed in the impact of relationship quality on export performance with most studies suggesting a positive impact (Felzensztein et al., 2015; Haddoud et al., 2018; Ural, 2009) and some studies claiming a moderating role of the type of network on this relationship (Jeong, 2016).

Regarding export market orientation, different studies confirmed a positive impact on export performance (Boso, Cadogan, and Story, 2011; Ju et al., , 2010 ; Ipek and Bıçakcıoğlu-Peynirci, 2019). However, this impact was indirect in some studies (Kayabasi and Mtetwa, 2016) and was not linear in other research (Cadogan, Kuivalainen, and Sundqvist, 2009). It is obvious that literature suggest a positive impact of marketing capabilities, relationship quality and export market orientation on export performance, however this direct positive relationship is challenged in some other studies.

The literature has a knowledge and population gap in studying the determinants of export performance of medical devices sector and Egyptian manufactures. Additionally, there is an evidence gap in the impact of entrepreneur orientation on export performance.

The aim of this study to determine and analyze the factors affecting export performance of medical devices manufacturers in Egypt. The research seeks to offer a comprehensive understanding of the challenges and opportunities faced by this sector. The findings are expected to provide actionable recommendations and roadmap for manufacturers and policymakers to develop the export capacity and performance and international positioning of Egypt's medical device industry

## 2-Literature review

## **Export performance**

The increased interconnectedness of economies and global markets has a great impact on speeding up the process of internationalization worldwide. In this context, export serves as a conventional and traditional means for companies to enter foreign markets and is considered a fundamental strategic choice to ensure survival and expansion of organizations as they board on the pathway of internationalization (Navarro-García, Peris-Ortiz and Barrera-Barrera, 2016; Chen, Sousa and He, 2016; Piñera-Salmerón, Sanz-Valle, and Jiménez-Jiménez, 2023). Furthermore, Sousa, (2004) highlighted that globalization helped organizations to find new external opportunities outside their domestic market. The authors showed that export activity increases flexibility of firms and helps them to penetrate external markets through a cost-effective, low risk and a quick method.

Aksoy, Akpınar and Ünüsan, (2024) describes export activity as the initial and most attractive phase for companies to internationalize. The authors explained both economic and strategic motivations for firms to sell their products abroad. There are different financial gains such as increased sales and profit margins, in-addition to strategic benefits including market diversification and competitive positioning. The effectiveness and efficiency of the economic and strategic objectives specified by the organizations is evaluated through measuring “**export performance**”

Zou, Taylor and Osland, (1998) defined export performance as “financial and strategic performance of the export venture and the firm's satisfaction with the export venture”. Our study adopts this definition of export performance. Furthermore, this study adopts perceived export performance scale developed by the authors.

There are various studies focusing on the determinants and factors influencing export performance. These factors are divided into internal and external variables. The internal variables are related to the characteristics and capabilities of the organizations and management. On the other side, the external variables are more focused on the industry and country level. (Chen, Sousa, and He, 2016; Sousa, Martínez-López and Coelho, 2008).

In this study, the focus of research will be on four internal variables affecting export performance (dependent variable) of medical devices manufacturers in Egypt. These variables are entrepreneur orientation, marketing capabilities, relationship quality with international network and export market orientation.

## **Entrepreneurial Orientation**

Entrepreneurial orientation is the behavioral aspects of a global mindset, reflecting senior management's tendency toward risk-taking, innovation, and proactive actions (Freeman and Cavusgil, 2007). Accordingly, the elements of entrepreneurial orientation are risk taking, proactiveness and innovation.

According to different research there is a positive relationship between entrepreneur orientation and export performance. Hossain et al., (2022) concluded that entrepreneur orientation positively influence export performance through innovative and differentiated products. Additionally, Li, Wei and Liu, (2010) argued that entrepreneur orientation increased knowledge of different Chinese manufacturers and accordingly provided them with competitive advantage and improved export performance.

Moreover, Karami and Tang, (2019) indicated that entrepreneur orientation has a positive impact on export performance. Organizations with high entrepreneur orientation build new networks easily allowing them to gain market insights and resources needed for effective export activity. Furthermore, Bıçakcıoğlu et al., (2019) showed that innovation allows organizations to expand in the international markets and boost their export performance.

Likewise, Khalid, (2019) indicated that both proactiveness and risk taking should accompany innovation to help organizations to discover new markets and opportunities and increase export activity. Based on the provided evidence, the first hypothesis is as follows:

**Hypothesis 1:** There is a positive impact of entrepreneur orientation on export performance of medical devices manufacturers in Egypt.

**Hypothesis 1a:** Innovation positively impacts export performance of medical devices manufacturers in Egypt.

**Hypothesis 1b:** There is a positive effect of risk taking on export performance of medical devices manufacturers in Egypt.

**Hypothesis 1c:** There is a positive impact of proactiveness on export performance of medical devices manufacturers in Egypt.

### **Marketing Capabilities**

Zou, Fang and Zhao, (2003) classified marketing capabilities into four different components which are pricing capability, distribution capability, communication capability and product development capability. Pricing capability is the extent which an export organization can apply and manage pricing strategies aiming to adapt to customer requirements and respond to competitor's actions. Distribution capability refers to the ability of the exporting company to support distributors in other countries and develop a strong relationship with them. Communication capability describes how the export company utilize and manage communication with customers and distributors. Finally, product development capability is the ability of export venture to develop new products aiming to satisfy customer needs and requirements.

Zou, Fang and Zhao, (2003) showed a positive effect of different aspect of marketing capabilities (product development, distribution, and communication) on export performance. Additionally, other study in the Algerian context concluded that good marketing capabilities allows organizations to face different challenges and obstacles in the international market and accordingly excel in export performance (Haddoud et al., 2018).

Furthermore, Hoque et al., (2020) showed that marketing capabilities allows organizations to adapt to changing market needs and increased competitiveness of international market. Moreover, Morgan, Feng, and Whitler, (2017) underscores that marketing capabilities enables exporting firms to leverage complex bundles of knowledge and skills allowing them to have competitive advantage in the international market.

Besides, Tan and Sousa, (2015) showed that the four dimensions of marketing capabilities allows organization to have lower cost than competitors and align products more closely with the unique preferences and needs of foreign markets and consequently improve export performance.

According to the supplied information the second hypothesis is as follows:

**Hypothesis 2:** There is a positive influence of marketing capabilities on export performance of medical devices manufacturers in Egypt.

### **Relationship quality with international network**

Relationship quality is the connections and networks developed beyond national boundaries. Lages, Lages, and Lages, (2004) identified four different dimensions of the relationship quality with international network in export. These dimensions are amount of information sharing, communication quality, long term relationship and satisfaction with the relationship.

Haddoud et al., (2018) identified a positive impact of foreign relationship on export performance of Algerian companies. This was supported by Silva, Moutinho and Vale, (2021) who studied international connections obtained from trade fairs and confirmed their positive influence on export performance. Additionally, Felzensztein et al., (2015) suggested that external network increase market reach through providing valuable information and opportunities that helps organizations to mitigate risks and challenges when entering new

markets. Moreover, Ahamed and Skallerud, (2015) supported the positive impact of relationship quality with international network on both financial and strategic performance of the exporting firms.

Based on the above information the third hypothesis is as follows:

**Hypothesis 3:** Relationship quality with international network positively impacts export performance of medical devices manufacturers in Egypt.

### Export Market Orientation

Export market orientation refers to the actions and activities taken by the companies to apply marketing concepts to their export performance (Cadogan, Kuivalainen, and Sundqvist, 2009). The authors defined export market orientation as “export-focused generation, dissemination, and responsiveness to export market intelligence “

Açıkıdilli et al., (2020) concluded that export market orientation in the form of generation and spreading of intelligence and market responsiveness allows exporters to understand the export market needs and requirements and adapt to them and consequently improve export performance and activity. This was confirmed by Boso, Cadogan, and Story, (2011) who showed that export market orientation has a direct influence on the performance of new export products. Export market orientation activities, which include the generation, dissemination, and response to market intelligence, enable firms to more effectively meet the needs and preferences of customers in international markets.

Additionally, Ju et al., (2010) showed the positive effect of export market orientation on export performance through increasing competitive advantage, knowledge generating and integration within the organization. Supporting the idea, Ipek and Bıçakcıoğlu-Peynirci,(2019) argued that research consistently indicates that companies with robust export market orientation adeptly tailor their strategies to align with the unique requirements of international markets, resulting in enhanced sales and profitability. Based on this evidence, the fourth hypothesis is:

**Hypothesis 4:** Export market orientation positively impacts export performance of medical devices manufacturers in Egypt.

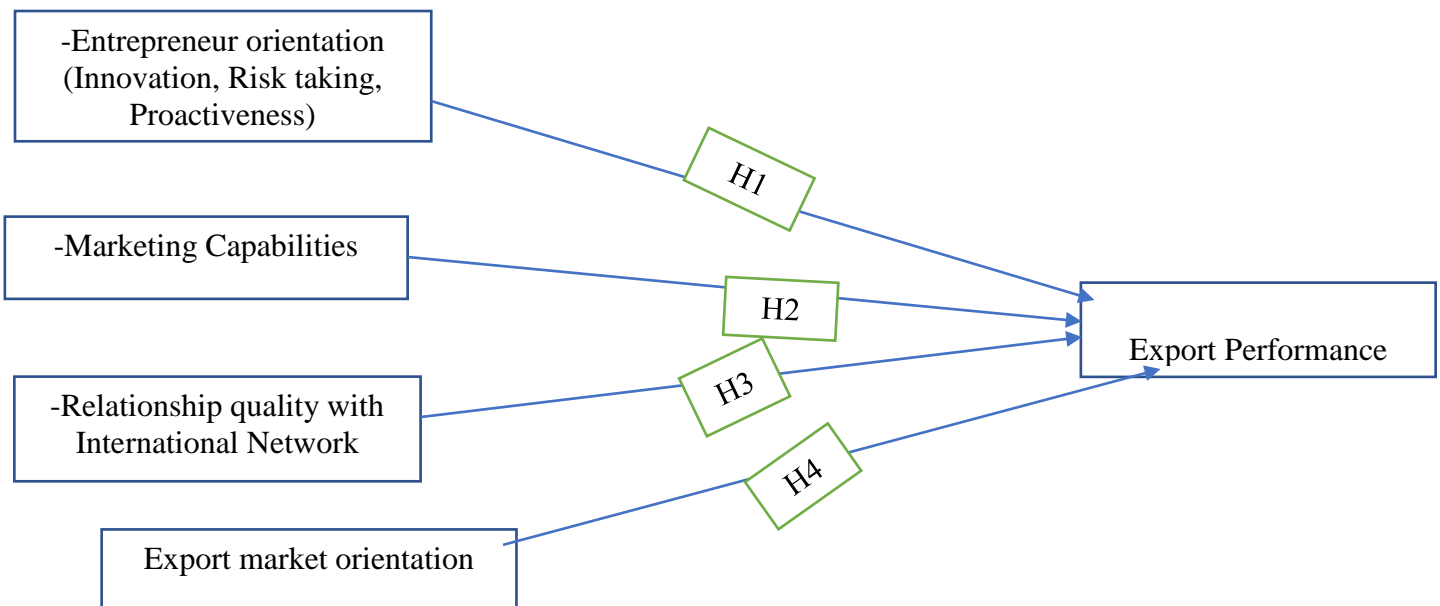


Figure 1: Proposed research model by the researcher

### 3-Research Objectives

- 1-To determine the effect of entrepreneur orientation on export performance of medical devices manufacturers in Egypt.
- 2- To determine the impact of marketing capabilities on export performance of medical devices manufacturers in Egypt.
- 3- To determine the effect of export market orientation on export performance of medical devices manufacturers in Egypt
- 4-To determine the impact of the relationship quality with international network on export performance of medical devices manufacturers in Egypt

### 4-Research Methodology

#### Research design

The research paradigm will be positivism. The research approach will be deductive approach based on testing hypothesis against quantitative observations and empirical findings. The design will be quantitative through examining relationships between different variables. The time horizon will be cross sectional (one shot study) at a single point. The researcher uses a quantitative approach based on the administration of a questionnaire. A set of closed- ended questions was used to collect the data.

#### Research population and sample

According to export council for medical industries, there is 93 export manufactures in the medical devices industry in Egypt. The population will be all the medical devices manufacturers in Egypt. All the 93 manufacturers will be approached for survey. The unit of analysis will be all managers involved in the export activity in the medical devices manufacturers in Egypt (CEOs, managing directors, export managers, export seniors). The application was first applied on an exploratory sample that consisted of 25 managers, and the purpose of the exploratory sample is to ascertain the psychometric properties of the study tool (validity and reliability).

#### Demographic Profile of the Respondents

The study sample was selected as a random sample. The following is a description of the study sample according to the demographic variables (Age – Managerial level - Sector). The age of study sample is divided into four groups. 25 - 34 years (21%), from 35 - 44 years (35.5 %), % from 45 - 54 years (33.3%) and 55 years and older (21.5 %). The managerial levels were CEO (24.7 %), managing director (36.6 %) and export managers (38.7 %). The sector of the sample was 72 % medical devices and 28 % Invitro-diagnostics.

*Table 1: Demographics of the sample*

Demography	Category	Frequency	Percentage
Age	25 - 34 years	20	21.5
	35 - 44 years	33	35.5
	45 - 54 years	31	33.3
	55 years and more	9	9.7
Managerial Level	CEO	23	24.7
	Managing Director	34	36.6

	Export Manager	36	38.7
<b>Sector</b>	Medical Devices	67	72.0
	In-Vitro Diagnostics	26	28.0

Source: Results of Statistical analysis

### Study validity

The validity of the study tool was confirmed using judge validity (face validity) and internal consistency validity.

### Judge validity

The study tool was presented in its initial form to a group of specialized and experienced judge from the faculty members of the University of Eslsca, and a letter was sent to them explaining the problem, objectives and questions of the study. The number of judge reached 3 judges in ESLSCA university and Cairo University. Based on the judges observations, in terms of the appropriateness of the parameters (parameter/statement) to what it measures, clarity, soundness of language, and appropriateness of response classes, the wording of some parameters was modified linguistically.

### Internal consistency validity

The validity of the internal consistency of the study tool was confirmed by calculating the Pearson correlation coefficient between the degree of each parameter with the total degree of the dimension to which the parameter belongs, through the application on a exploratory sample consisting of (25) managers. The values of the correlation coefficients ranged from (0.60) to (0.71), all the values of the correlation coefficients were positive, and statistically significant at the (0.05) level and indicate the internal consistency between the degree of each parameter and the total degree. Thus, it can be said that all parameters have internal consistency.

### Reliability

The reliability of the study tool was confirmed by alpha cronbach coefferceint:

Table 2: Alpha Cronbach reliability

Variables	Dimensions	Alpha Cronbach
Independent	Entrepreneur orientation	0.89
	Marketing Capabilities	0.95
	Relationship quality with International Network	0.93
	Export market orientation	0.94
Dependent	Export Performance	0.90

Source: Results of Statistical analysis

The values of Cronbach's alpha coefficients ranged from (0.89) to (0.95), these values are high and indicate that the study tool has a high degree of stability

### Final Questionnaire form

The questionnaire is divided into two sections. The first section is demographic section of age, managerial levels and sector. The second section is closed ended questions in the form of 5-point Likert scale ranging from strongly agree to strongly disagree. The number of parameters in the questionnaire was (9) parameters concerned to the dependent variable "Export Performance", and (53) parameters concerned to the independent variable "Factors Affecting the Export Performance of Medical Devices Manufacturers in Egypt", distributed

on (4) dimensions as follows: (9) parameters concerned to entrepreneur orientation (innovation, risk taking, proactiveness), (16) parameters concerned to marketing capabilities, (14) parameters concerned to relationship quality with international network, (14) parameters concerned to export market orientation.

The survey is adopted from different articles in the literature. Export performance is adopted from Zou, Taylor and Osland, (1998) addressing financial performance, strategic performance, and export satisfaction of exporting organizations. Entrepreneur orientation is measured using the Miller/Covin and Slevin, (1989) EO Scale focusing on innovation, risk taking and proactiveness. Marketing capabilities questions are adopted from Zou, Fang and Zhao, (2003) which included four different export marketing capabilities: pricing capability, product development capability, distribution capability, and communication capability. Relationship quality with international network will be measured using the RELQUAL scale developed by Lages Lages and Lages, (2004). Export market orientation in the form of export-focused generation, dissemination, and responsiveness to export market intelligence will be measured using questions adopted from Cadogan, Kuivalainen, and Sundqvist, (2009).

## 5-Research Results

### Descriptive Data Analysis

The descriptive data analysis describes the data trends and identifies the direction of the collected data through center tendency (mean), dispersion (standard deviation). This analysis did not delve deeper into the relationship between the constructed variables. The mean value is the average where all answers are summed up then divided by the total number of participants. The standard deviation represents how the responses deviate from the mean value. The following results were obtained:

*Table 3: Descriptive Statistics for All variables*

variable.	Dimension	Mean	Standard Deviation	Response
Dependent	Export Performance	3.76	0.68	Agree
Independent (1)	Entrepreneur orientation	3.27	0.64	Neutral
	(a) Innovation	3.32	0.76	Neutral
	(b) Risk taking	3.20	0.79	Neutral
	(C) Proactiveness	3.29	0.72	Neutral
Independent (2)	Marketing Capabilities	3.75	0.42	Agree
Independent (3)	Relationship quality with International Network	3.78	0.38	Agree
Independent (4)	Export market orientation	3.95	0.46	Agree

Source: Results of Statistical analysis

### Normality Test

The normality test is the first test in the inferential analysis to find out which group of test cases are to be performed on the collected sample size. There are two main paths for inferential analysis, either parametric analysis or non-parametric analysis. A parametric analysis path is used for normally distributed data and a nonparametric analysis path is used for data that is not normally distributed. The test used in the normality analysis is Kolmogorov-Smirnov statistic and Shapiro-Wilk test (Sekaran, 2003). The decision point criteria for the Kolmogorov-Smirnov statistic and Shapiro-Wilk test is the sig. value which identifies the significance of the test. A sig. value that occurs below 0.05 indicates that the test is significant and the target variable is not normally distributed. However, a sig. value that occurs above 0.05 indicates that the test is not significant and the target variable is normally distributed.

Table 4: Normality Test for the Theoretical Framework Variables

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	sig.	Statistic	df	sig.
Export Performance	.059	93	.661	.162	93	.503
Entrepreneur orientation	.054	93	.664	.133	93	.524
(a) Innovation	.072	93	.615	.152	93	.476
(b) Risk taking	.032	93	.724	.130	93	.524
(C) Proactiveness	.035	93	.721	.178	93	.490
Marketing Capabilities	.025	93	.746	.190	93	.472
Relationship quality with International Network	.063	93	.640	..097	93	.668
Export market orientation	.046	93	.711	.108	93	.310

Source: Results of Statistical analysis

The sig value as a decision point for the Kolmogorov-Smirnov statistic and Shapiro-Wilk test indicates that all the constructed independent and dependent variables are normally distributed as their sig value occurs above 0.05. Based on this result, a parametric analysis is used for the inferential data analysis.

### Regression Analysis

Regression analysis measures the relationship between one or a group of independent variables and one dependent variable. This analysis is used for normally distributed variables, as this test is a parametric test. The regression analysis is also used for variables that are not normally distributed in case of a large sample size which violates the assumption of normality (Field and Miles, 2000). The collected sample is identified as a large sample when it satisfies the following conditions:

- The collected sample size is larger than 50 units.
- The collected sample size is more than ten times the number of predictors (independent variables).
- The collected sample size is larger than  $10+8K$  where  $k$  is the number of predictors (Field and Miles, 2000).

The constructed conceptual framework consists of four predictors. The collected sample size is 93, which satisfies all the conditions of a large sample size therefore, the assumption of normality is not violated and the regression parametric test is used in the analysis of the variables which are normally distributed.

### Testing Hypothesis

The study hypothesis are as follows:

Hypothesis one ( $H_1$ ): There is a positive impact of entrepreneur orientation on export performance of medical devices manufacturers in Egypt.

( $H_{1a}$ ): There is a positive impact of innovation on export performance of medical devices manufacturers in Egypt.

( $H_{1b}$ ): There is a positive impact of risk taking on export performance of medical devices manufacturers in Egypt.

( $H_{1c}$ ): There is a positive impact of Proactiveness on export performance of medical devices manufacturers in Egypt.

Hypothesis two ( $H_2$ ): There is a positive impact of marketing capabilities on export performance of medical devices manufacturers in Egypt.

Hypothesis Three ( $H_3$ ): There is a positive impact of relationship quality with international network on export performance of medical devices manufacturers in Egypt.

Hypothesis Four (H<sub>4</sub>): There is a positive impact of Export market orientation on export performance of medical devices manufacturers in Egypt.

To test the above hypothesis, the simple correlation analysis was applied, followed by simple regression analysis, the results was as follows.

**Table 5: Simple correlation and regression analysis for dependent and independent variables**

Ind. Variable	Dep. Variable	r	Regression Model	F	Sig.	β	t	Sig.	R <sup>2</sup>
Entrepreneur orientation	Export performance	0.590**	constant	48.61**	0.00	2.260	9.35	0.00	0.34
						0.559**	5.535		
Ind. Variable	Dep. Variable	r	Regression Model	F	Sig.	β	t	Sig.	R <sup>2</sup>
Innovation	Export performance	0.356**	Constant	14.365**	0.00	2.922	9.558	0.00	0.13
						0.253**	2.814		
Ind. Variable	Dep. Variable	r	Regression Model	F	Sig.	β	t	Sig.	R <sup>2</sup>
Risk taking	Export performance	0.431**	Constant	20.775**	0.00	2.570	9.563	0.00	0.18
						0.371**	4.558		
Ind. Variable	Dep. Variable	r	Regression Model	F	Sig.	β	t	Sig.	R <sup>2</sup>
Proactiveness	Export performance	0.369**	Constant	14.378**	0.00	2.614	8.454	0.00	0.14
						0.349**	3.792		
Ind. Variable	Dep. Variable	r	Regression Model	F	Sig.	β	t	Sig.	R <sup>2</sup>
Marketing capabilities	Export performance	0.711**	Constant	93.191**	0.00	0.586	1.294	0.00	0.51

Ind. Variable	Dep. Variable	r	Regression Model	F	Sig.	$\beta$	t	Sig.	R <sup>2</sup>
Relationship quality with international network	Export performance	0.579**	Constant	44.252**	0.00	1.157**	9.654	0.00	0.32
						0.987	1.294		
Export market orientation	Export performance	0.501**	Constant	16.400**	0.00	0.734**	9.654	0.00	0.251
						1.623	2.839		
						0.541**	3.764		

Source: Results of Statistical analysis

\*\*means sig. at ( $\alpha \leq 0.05$ )

According to results at table 5, F values,  $\beta$  and r suggests positive impact of the different independent variables on export performance of medical devices manufacturers in Egypt and accordingly the results are as follows:

Hypothesis one (H<sub>1</sub>) " There is a positive impact of entrepreneur orientation on export performance of medical devices manufacturers in Egypt." is accepted. ( $r=0.590$ ,  $R^2=0.348$ ,  $\beta=0.559$ ).

(H<sub>1a</sub>) : " There is a positive impact of innovation on export performance of medical devices manufacturers in Egypt." is accepted. ( $r=0.356$ ,  $R^2=0.13$ ,  $\beta=0.253$ ).

(H<sub>1b</sub>) : " There is a positive impact of risk taking on export performance of medical devices manufacturers in Egypt." is accepted. ( $r=0.431$ ,  $R^2=0.18$ ,  $\beta=0.253$ ).

(H<sub>1c</sub>): "There is a positive impact of Proactiveness on export performance of medical devices manufacturers in Egypt." is accepted. ( $r=0.369$ ,  $R^2=14$ ,  $\beta=0.349$ ).

Hypothesis two (H<sub>2</sub>): " There is a positive impact of marketing capabilities on export performance of medical devices manufacturers in Egypt." is accepted. ( $r=0.711$ ,  $R^2=514$ ,  $\beta=0.1157$ ).

Hypothesis Three (H<sub>3</sub>): " There is a positive impact of relationship quality with international network on export performance of medical devices manufacturers in Egypt." is accepted. ( $r=0.579$ ,  $R^2=0.32$ ,  $\beta=734$ ).

Hypothesis Four (H<sub>4</sub>) " There is a positive impact of Export market orientation on export performance of medical devices manufacturers in Egypt." is accepted. ( $r=0.501$ ,  $R^2=0.25$ ,  $\beta=541$ ).

## 5-Discussion

### Entrepreneur orientation

The current study identified a positive impact of entrepreneur orientation with the dimensions of innovation, risk taking and proactiveness on export performance. Egyptian manufacturers of medical devices that focus on technological innovation, research and development, and the creation of new products, as well as modifications to existing product lines, tend to exhibit strong export performance. Furthermore, by undertaking high-risk, high-return projects and developing aggressive strategies to identify potential opportunities, Egyptian manufacturers of medical devices enhance their export activities. Additionally, by proactively initiating actions and strategies, adopting competitive stances, and being the first to introduce new medical devices and products, organizations can increase their exports and boost their overall export activity.

The current findings agree with several studies in the literature who consistently shows that organizations with strong entrepreneur orientation having higher innovation, proactivity and willing to take risks which directly contributes to better export outcome (Hossain et al., 2022) (Karami and Tang., 2019; Hizarci et al., 2022). These organizations excel in innovating and introducing new products, differentiating their products from direct and indirect competitors, and adjusting their approaches to meet customer and market needs and requirements.

On the other side, the current study results contradict with Haddoud et al., (2018) that studied innovation in the Algerian context and reached non-significant impact of innovation of Algerian manufacturers on export performance. Another study conducted by Renko, Carsrud, and Brännback, (2009) focusing on US biotechnology didn't find a significant impact of entrepreneur orientation on performance of these companies because of the highly technological environment that reduces the impact of innovation, risk taking and proactiveness. Felzensztein et al. (2015) results in the Chilian mining, food processing and software industries doesn't agree with the current research . The authors didn't find impact of risk taking on export performance and found a positive impact of innovation, proactiveness in developed countries only such as United States and Canada.

### Marketing Capabilities

This study acknowledged a positive impact of marketing capabilities on export performance. Of Egyptian manufacturers. The four dimensions of marketing capabilities are product development, pricing, distribution, and communication capabilities. The current outcomes of positive effect of marketing capabilities on export performance of Egyptian medical devices manufacturers agrees with several studies in the literature (Zou, Fang and Zhao, 2003; Haddoud et al. 2018; Pham, Monkhouse, and Barnes, 2017). These studies reached the conclusion that good capabilities of product development, pricing, communication, and distribution increase the overall export performance through increasing profit margin, providing competitive edge, branding advantage and customer satisfaction.

On the other side, other studies partly agree with our current findings. Kayabaşı and Mtetwa, (2016) didn't find a direct positive relationship between marketing capabilities and export performance in the Turkish manufacturing firms. According to the authors, marketing effectiveness is the mediator between the two variables. Additionally, Al Aali et al., (2013) claimed that the impact of marketing capabilities on export performance depends on whether the product is high involvement or low involvement. These diverse results may be due to different context of these studies than our study.

### Relationship Quality with international Network

The current study confirmed the positive impact of relationship quality with international network on export performance. Egyptian organizations who maintain effective and strategic relationships with importers and distributors through sharing confidential information, discussing business strategies and openly discussing business collaborations and opportunities excel in the international market. These current findings agree with

other research in the literature, (Haddoud et al.,2018; Felzensztein et al., 2015; Ural, 2009). These studies claimed that building strong relationship between business partners enhances the commitment of both parties, leads to understanding customer, regulatory requirements and opportunities and threats. Additionally, these strong relationships allow exporting organizations to mitigate risk in the importing countries and convert the normal business transactions to long term partnership and relationship.

There is a conflict in the literature on the importance of the network obtained from trade fairs and internet on export performance. Jeong, (2016) claimed that Korean companies didn't benefit from network obtained from fairs and internet, while Silva, Moutinho and Vale, (2021) showed that Portuguese exporters built strong business relationship from these networks and fair. Our study didn't focus directly on the network obtained from fairs; however Egyptian manufacturers regularly attend medical exhibitions in Germany, Dubai and other target markets and build strong business relationship with customers attending these exhibitions.

### **Export Market Orientation**

The current study findings indicates that Egyptian medical devices manufacturers have export market orientation that positively affects their export performance. It is believed that knowledge is power and competitive intelligence is one of the keys to success in the domestic and international market. Thus, generation of export market intelligence including information about market trends, technological and regulatory framework helps organization to understand their customer requirements, needs in the export market.

Many literatures agrees with our current findings of the positive relationship between export market orientation and export performance, (Boso, Cadogan, and Story ,2011; Ju et al., 2010; Ipek and Bıçakcıoğlu-Peynirci ,2019) conducted different research in China, UK and Turkey and suggested that export market orientation helps organizations to adapt to customer and market needs and improves customer satisfaction. They also agreed that export market orientation allowed companies to tailor their strategies to cope with unique requirements of each target market. Additionally, this orientation is a key factor that aids them to choose the right partner without having the chance to exhibit opportunistic activities.

Alternatively, Kayabasi and Mtetwa, (2016) didn't find a direct relationship between export market orientation and export performance. The authors suggested mediators of marketing capabilities and marketing effectiveness between the two variables. Cadogan, Kuivalainen, and Sundqvist, (2009) partially disagrees with our current findings. The authors suggested a positive correlation only in low level of export market orientation. This relationship becomes nonlinear according to the study in high level of export market orientation.

### **6-Conclusions and Future recommendations**

In this research, the factors affecting export performance of medical devices manufacturers were tested and analyzed. Literature has many internal and external variables affecting export performance. The impact of four internal independent variables on export performance were tested in the current research. These four variables are entrepreneur orientation, marketing capabilities, relationship quality with international network and export market orientation. The study confirmed positive impact of the four independent variables on the export performance of medical devices manufacturers in Egypt. There are several quantifiable benefits from this study for manufacturers including higher market share and increased profit margins, higher sales volume, improved customer retention rates and customer satisfaction rates, reduced operational costs and increased long terms contracts. On the other side, there are non-quantifiable benefits such as improved brand image and brand reputation, market leadership, strong alliances and customer trust and loyalty, adaptability to market changes and regulatory compliance and alignment.

### **Recommendations for future researchers**

- 1-It is recommended for researchers to study other internal and external factors affecting export performance of medical devices manufacturers in Egypt rather than those studied in this research.
- 2-It is recommended to study factors affecting export performance of other manufacturers in Egypt in different industries and sectors.
- 3-It is suggested to conduct further research and comparison between factors affecting medical devices manufacturers in Egypt and other countries.

### **Recommendations and roadmap for Egyptian medical devices manufacturers**

- 1-Manufacturers should focus on innovating new products based on forecast and market study of potential opportunities and market gaps.
- 2-Manufacturers are recommended to specify certain budget yearly for innovation and research and development for specific products based on a precise plan and check points.
- 3-It is recommended for manufactures to establish projects whose risk is calculated, and risk-benefit analysis is conducted.
- 4- It is advised for medical devices manufacturers to have departments for competitive intelligence in both domestic and international markets.
- 5-It is recommended to hire employees responsible for market research, market study and account management for different international markets.
- 6-Enhancing regulatory compliance through a strong quality team is important to understand regulatory requirements in each of export markets.
- 7-Hiring account manager for each export area is recommended and this manager should be familiar with the cultural, regulatory and political infrastructure of this export region.
- 8-It is advised to provide training for these account managers on how to ensure customer satisfaction, loyalty, and trust.
- 9-It is recommended to search for strategic partners for joint ventures establishing, for example searching for innovative Chinese companies to manufacture new products in Egyptian facilities for the African and middle east market.
- 10- It is recommended to build trustworthy long-term relationships with distributors and agents by ensuring fair practices, regular communication, and mutual benefits.
- 11-Attending trade fairs and going on business missions in target export markets are important to build new network, penetrate and understand new export markets.

### **Recommendation for policy makers in Egypt**

- 1-It is recommended for Egyptian government to provide financial incentives such as tax breaks, subsidies, and funding opportunities for R&D and innovation in the medical devices sector.
- 2-It is recommended as well to work enhancing trade agreements that reduce tariffs and simplify export procedures for medical devices.
- 3-It is advised for the Egyptian government to streamline the process for obtaining export licenses and ensure transparency and efficiency in regulatory approvals.
- 4-Arranging and organizing international trade fairs are an effective method to help Egyptian manufacturers to build and enhance international networks.
- 5-Providing financial support for manufacturers who attends international trade fairs by the Egyptian government is an efficient method to support Egyptian manufacturers.

### **7-Limitations**

There are some limitations in this study as follows:

- 1-Only four factors affecting export performance of medical devices manufactures in Egypt were studied in this research. Other important internal and external factors were not covered in this research.

2-Only one medical industry was covered in this research with many other important industries such as pharmaceutical and cosmetics industries not covered despite the presence of many manufacturers in these industries.

3-The results focused only on Egyptian manufacturers of medical devices and therefore can't be generalized to other manufactures in other countries or other industries in Egypt.

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