The impact of supply chain flexibility on organizational excellence: an empirical study on the Egyptian pharmaceutical manufacturing companies

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Abstract

Purpose: The purpose of this study is to examine the critical role of supply chain flexibility in achieving organizational excellence in pharmaceutical manufacturing companies in Egypt.

Methodology/method/design: The survey list was relied upon to collect data that served the purpose of the study.

Results: the results show that there is a statistically significant relationship between supply chain flexibility and organizational excellence at a 99% level of confidence, showing that a range of internal and external factors, such as suppliers, products, delivery, manufacturing, and information system flexibility, contribute to the organizational excellence in the pharmaceutical manufacturing companies in Egypt. The results provide the foundation for an additional in-depth investigation that will identify the impact of supply chain flexibility on organizational excellence in Egypt's pharmaceutical sector.

Keywords: flexibility, supply chains, supply chain flexibility, organizational excellence, Egyptian pharmaceutical manufacturing companies.

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دور مرونة سلاسل الامداد على التميز المؤسسى: دراسة ميدانية على شركات صناعة الادوية المصرية

الملخص

الهدف: يهدف البحث إلى التعرف على دور سلاسل الإمداد في تحقيق التميز المؤسسي، وأجريت الدراسة على عدد من الشركات الصناعية العاملة في قطاع الأدوية في القاهرة الكبرى .

المنهجية/المنهج/التصميم:تم الاعتماد على قائمة الاستقصاء لجمع البيانات الأولية التي تخدم غرض الدراسة.

النتيجة:توصلت الدراسة إلى وجود علاقة ذات دلالة إحصائية بين مرونة سلاسل الإمداد والتميز المؤسسي بالشركات محل الدراسة عند مستوى ثقة 99 %. حيث تبين أن مجموعة من العوامل الداخلية والخارجية، مثل الموردين، والمنتجات، والتسليم، والتصنيع، ومرونة نظام المعلومات، المساهمة في التميز المؤسسي في شركات تصنيع الأدوية في مصر. توفر النتائج الأساس لإجراء تحقيق إضافي متعمق لتحديد دور مرونة سلسلة التوريد على التميز المؤسسي في قطاع الأدوية في شركات الأدوية المصرية.

الكلمات المفتاحية: المرونة، سلاسل التوريد، مرونة سلاسل التوريد، التميز المؤسسي، شركات صناعة الأدوية المصرية.

1. Introduction

Effective management of the supply chain has been increasingly recognized as a crucial factor for improving organizational performance (Yoo and Cho, 2021).

According to (Centobelli et al ,2020) to attain competitive advantage and improve company performance in an uncertain environment, several organisations have implemented supply chain flexibility to respond to market requirements.

And according to (Enrique et al ,2022) companies should build more flexible supply networks in response to increasing environmental risks.

“Flexibility has been one of the main concerns of the operations management literature for several decades” (Stevenson and Spring, 2007).

Thus, Companies cannot get a competitive edge using the old supply chain management techniques. Supply chain flexibility refers to the ability to respond to supply chain disruptions, changes in demand, and external market fluctuations.

Organizational excellence in today's turbulent environment has become a matter of interest to many authors since the investment of organisations in vital opportunities is considered an important goal an organization seeks to reach (Arbab and Abaker, 2018).

It reflects the ability of organisations to adapt and adjust to the contingencies of change and recover the stability of organizational systems through their own dynamic processes to achieve organizational excellence (Felício et al, 2022).

So th researcher can conclude Organizational excellence is essentially about aiming for the highest standards. It involves establishing a setting in which all facets of the company, from strategy and leadership to personnel and procedures, are

continuously enhanced and optimized. It's about attaining long-term prosperity while adhering to your moral principles.

Therefore, this study is intended to answer the following questions (RQs):

RQ1: How can companies enhance their supply chain flexibility within their organisations?

RQ2: What is the relationship between supply chain flexibility and organizational excellence in Egyptian pharmaceutical manufacturing companies?

2.literature review, Conceptual framework, and hypothesis development

2.1. Supply chain flexibility

Many scholars and researchers defined supply chains in different ways, but in aggregate, many of them agreed on the main components of the definition. But among supply chain scholars, there is a lack of consensus on conceptualizing and defining supply chain flexibility as a distinct construct (Liao, 2020). In this study, supply chain flexibility is defined as the firm's ability to configure and manage the supply chain through collaboration with supply chain partners in response to a rapidly changing environment in an effective and efficient manner. Supply chain flexibility is essential in an uncertain environment. Many organisations have adopted supply chain flexibility to develop adaptive changes to satisfy market requirements so that they can achieve competitive advantage and superior business performance (Shashi et al, 2020). Supply chain flexibility is a source of competitive flexibility that is derived from a combination of other resources linked to the main resources (Singh and Acharya, 2013). So, the researcher can conclude that supply chain flexibility is the ability to easily

adjust production levels, raw material purchases, and transport capacity in a dynamic, uncertain environment to satisfy market requirements and achieve customer satisfaction.

The authors have acknowledged the importance of flexibility in meeting customer demands and improving responsiveness (Stevenson and Spring, 2007).

Supply chain flexibility is crucial in today's business environment, which is characterized by complexity, continuous change, and uncertainty.

According to (Manners et al ,2017), being flexible makes the company vary according to its needs. Provides the company with the ability to adapt. Companies must realize real competition (Grigore, 2007).

2.2. organizational excellence

Organizational excellence is the result of a continuous journey (from quality manual inspection to sustainable excellence) (Akanmu et al, 2022).

Organizational excellence is critical to the development of organisations and, given the role of organisations in the modern world, to the economic and social development of societies.

The ability of organisations to adapt and adjust to the contingencies of change and restore organizational system stability through their own dynamic process (Felício et al, 2022).

The excellence model is a measure of the establishment of systems in organisations and self-evaluation, which determines managers' policies to improve performance. The concepts "business excellence" and organizational excellence" are used interchangeably, with the former being mostly used in the private sector and the latter in the public sector (Al-Dhaafri et al, 2016). So, the researcher can conclude that organizational excellence may be considered as an organization's growth and

enhancement in all aspects so that it can balance all benefits and expectations.

Excellence model for the European Foundation for Quality Management (EfQM)

Organizational excellence models are used as a powerful tool for the evaluation of system deployment in organisations (Avazpour et al., 2013).

The EFQM Excellence Model is a practical tool that indicates a business organization's position on the path to excellence, assists in identifying shortcomings, and encourages appropriate (Calvo-Mora et al, 2020; Szyrocka and Roszak, 2019;Uygur & Sümerli, 2013).

As a result, total quality management and the EFQM Excellence Model complement each other in terms of required achievement so that businesses and organisations can continue to exist in the current market.

Enablers and results in the excellence model for the European Foundation for Quality Management (EfQM):

Based on the EFQM, there are two sets of dimensions, The first group deals with the enablers and includes leadership, strategy, people, partnerships, resources, and processes, and the second group is concerned with results. “Results” are caused by the “Enablers," including results related to customers, people, and society (Haerizadeh, 2022; Calvo-Mora et al., 2020; Uygur & Sümerli, 2013).

Leadership excellence

The goal, vision, and values of an organization are created by its leaders. The future is shaped and laid out by the leaders of excellent organizations. Leaders of outstanding firms possess adaptable personalities and ensure that the organization will succeed by identifying and executing critical elements. Leaders

need to interact with partners, clients, and members of the public (Dahlgaard & Anninos, 2022; Dubey, 2015; Jabnoun, 2019).

Strategy excellence

A key step towards quality is the strategy's structure. Through monitoring market possibilities and dangers and informing staff members of all procedures, companies can develop a policy. And a plan that takes its stakeholders' needs and aspirations for the future into account (Dahlgaard and Anninos, 2022; Dubey, 2015; Jabnoun, 2019).

Subordinates' excellence

Organisations can only compete and survive in highly competitive market conditions if they have adequate human resources. An outstanding firm should provide its employees with the chance to participate in the decision-making process and showcase their abilities. Outstanding companies cherish their workers and have a vision and mission that benefits both the shareholders and the employees(Dahlgaard and Anninos, 2022;Alsarayrah, 2021; Jabnoun, 2019).

Resources and process excellence

Proficient companies organize and oversee their collaboration with outside partners. Following an analysis of the organization's resources and collaboration, the external partner's cooperation (Dahlgaard and Anninos,2022; Jabnoun, 2019;Arbab and Abaker, 2018).

The dimension of results indicates what an organization has obtained. The results of an organization that has achieved excellence must always indicate a positive tendency and/or a good performance; the targets must become appropriate and reachable; the performance must become high when compared to other organisations; and all results must emerge from the approach. In addition, the results must include relevant areas

and activities (Uygur and Sümerli, 2013; Calvo-Mora et al, 2020).

4.4. The relationship between supply chain flexibility and organizational excellence

(AlHalaseh and Ayoub, 2021) clarify that an organization's flexibility refers to its ability to review and alter its marketing efforts in a short period of time to respond swiftly to changing environmental conditions.

According to (Johnson et al,2003), organisations that adapt to change proactively (market flexibility) have a long-term strategic advantage. the impact of supply chain flexibility in achieving organizational in Improving the organizations' ability to deal with quick changes in the environment in an efficient and effective manner and improving the organizations' capacity to advertise their products and services and create genuine value for consumers (AlHalaseh and Ayoub, 2021;Holtan et al., 2021;Macclever et al, 2017;Urtasun et al, 2014;Babu et al, 2008).

Therefore, the researcher can conclude that supply chain flexibility can help bridge the gap between the organization and its customers in a turbulent environment. Which may help in achieving organizational excellence. The creation of a flexible supply chain is a major factor in organizational excellence, as are the responsiveness and agility required for true supply chain flexibility. Based on the given analyses, the following hypothesis is proposed:

H1: Supply chain flexibility has no significant impact on organizational excellence in the pharmaceutical manufacturing companies in Egypt.

supply chain flexibility Dimensions in relation to organizational excellence:

Because of its multidimensional form, flexibility is a complicated variable. Many different forms or dimensions of flexibility have been found. (Owusu et al, 2022; Manders et al, 2017) examine many dimensions of supply chain flexibility and contend that each organization systematically balances or combines various qualities under varying conditions.

Sourcing flexibility

The ability of an organization to have more than one supplier for a similar type of product is useful when one supplier is unable to produce a large quantity of a product or when the material or product received from the supplier is of poor quality; in this case, the organization can choose another supplier(Khanuja and Jain, 2021; Manners et al, 2017; Singh and Acharya, 2013)

Based on the given analyses, the following sub-hypothesis is proposed:

H1.1. Sourcing flexibility has no significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.

Manufacturing flexibility

In general, flexibility is a broad concept that varies greatly depending on the context (Simangunsong et al, 2012). In the manufacturing context, it symbolizes the production function's ability to make necessary adjustments to cope with environmental changes (Zeng et al, 2013). Manufacturing flexibility is the organization's ability to manage production resources and uncertainty to meet a variety of customer requests (Liao, 2020; Manners et al, 2017).

Based on the given analyses, the following sub-hypothesis is proposed:

H1.2. Manufacturing flexibility has no significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.

Product Flexibility

Product flexibility is the amount of adaptability in a product design for any future change, including new products and derivatives of existing products. A flexible design would cut redesign costs and provide a faster response to customers while improving performance. In a supply chain framework, product flexibility can be defined as the ability to manage complex, non-standard orders, fulfil unusual customer needs, and develop products with multiple features, alternatives, sizes, and colors (Yoo and Cho, 2021; Liao, 2020; Singh and Acharya, 2013).

Based on the given analyses, the following sub-hypothesis is proposed:

H1.3. Product flexibility has no significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.

Volume flexibility is defined as a firm's ability to operate at different levels of production output while remaining economically and effectively profitable (Jain, 2021; Liao, 2020; Spring, 2007). Volume flexibility enables businesses to respond to dysfunctional variations in customer demand levels while remaining profitable (Khanuja & Jain, 2021). Volume flexibility is the ability to generate more or less than the installed capacity of a product (Singh and Acharya, 2013).

Based on the given analyses, the following sub-hypothesis is proposed:

H1.4. Volume flexibility has no significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.

Information System Flexibility: Information system flexibility is defined as an organization's collective information system's capacity to adapt and support changing business operations (Singh and Acharya, 2013). Based on the given analyses, the following sub-hypothesis is proposed:

H1.5. Information system flexibility has no significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.

Physical Distribution Flexibility

Physical distribution flexibility refers to a company's capacity to swiftly and effectively modify inventory, packaging, warehousing, and delivery of physical products to fulfil consumer needs (Tosun and Uysal, 2015). Outbound logistics flexibility is another name for it. Physical distribution flexibility necessitates the flow of materials and information.

Based on the given analyses, the following sub-hypothesis is proposed:

H1.6. Information system flexibility has no significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.

3.Research methodology.

3.1. proposed Research framework

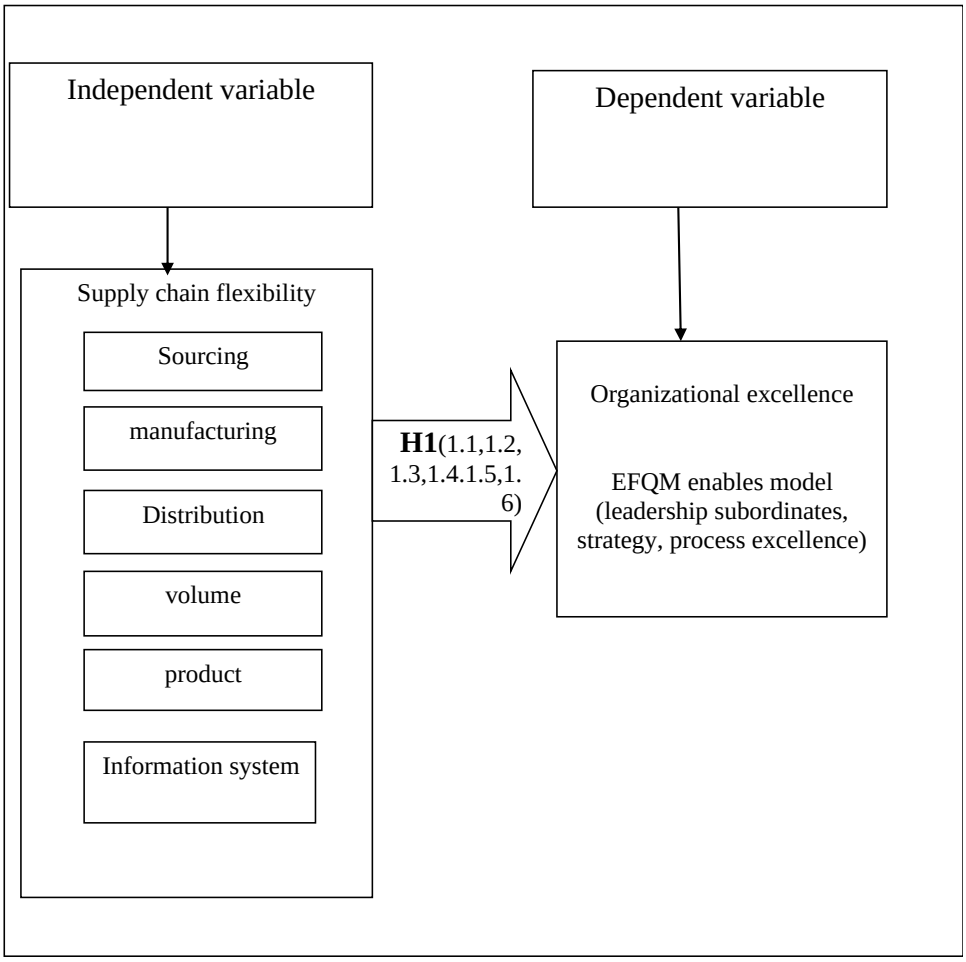

Fig (1) proposed research framework.
developed by the researcher.

3.2. Research design and sampling technique.

3.2.1. population and sample

Research population.

The main aim of this research is to examine the impact of supply chain flexibility on organizational excellence in

Egyptian pharmaceutical manufacturing companies. Therefore, it is important to elicit responses from many Egyptian companies to generate valid and reliable information. The study population represents pharmaceutical manufacturing companies operating in Greater Cairo, of which 90 are listed according to the Chamber of Pharmaceutical Industry 2022. The selection of these sectors was based on that.

Pharmaceutical manufacturing firms are considered an important strategic sector. The volume of investments in this sector has a unique role in expanding economic opportunity because it is universal to human life and health. The industry operates at multiple levels of society.

Research Sample

For this study, the data was collected through a paper and an online survey, with a sample taken from the Egyptian pharmaceutical companies in Greater Cairo as the population. Potential participants in this study were supply chain managers, operations managers, and other decision-makers. A simple random sample from the total population was taken.

The following were included as criteria to improve the likelihood of obtaining a representative sample:

A simple random sample is the sampling technique of this study. Simple random sampling was the most suitable one for this research, which is a subset of a statistical population . After analyzing the 406 lists that were received, which account for 98% of the total sample size, 402 lists are considered valid and suitable for examination in the questionnaire.

3.2.2. Data Collection

A simple random sample is the sampling technique of this study. which is a subset of a statistical population in which each member of the subset has an equal chance to be chosen. respondents based on their expertise in supply chain flexibility

and organizational excellence. The data was collected through a paper and online survey. All constructs were measured on a Likert-five scale, which is organized from strongly disagree to strongly agree and takes a weight of 1–5. All questions are based on literature and modified to suit this research objective.

Data techniques

The data was analyzed using SPSS 24, a statistical software for the social sciences and Amous tool. Cronbach's alpha coefficient was used to assess validity and reliability. A value above 0.70 indicates strong dependability. The study utilized the sign test, a non-parametric hypothesis test, for assessing general attitudes in non-normally distributed samples. The study utilized logit regression; a non-parametric regression method employed when the dependent variable does not fit the normal distribution. The study analyzed the association between green human resource practices and sustainable performance aspects using the Spearman correlation coefficient, which is commonly used to examine relationships between ordinal variables (James et al,2017).

4.Hypotheses testing and statistical analysis

4.1. Reliability and Validity test

Reliability refers to the degree to which the results obtained by measurement and procedure can be replicated, while validity expresses the degree to which a measurement measures what it purports to measure (Bolarinwa, 2015).

In testing the reliability of the questionnaire, the researcher used Cronbach’s Alpha coefficient: this coefficient varies between zero (no reliability) and one (maximum reliability); and in testing its validity, the self-validity coefficient was calculated as the square root of the reliability coefficient.

Table (1) the reliability and validity test

Study variables	statements	Cronbach's alpha coefficient	Validity coefficient
Supply chain flexibility	18	0.779	0.883
Organizational excellence	19	0.787	0.887

Source: researcher based on SPSS Output.

In testing the reliability of the questionnaire, the researcher used Cronbach's Alpha coefficient, this coefficient varies between zero (no reliability) and one (maximum reliability); and in testing its validity, self-validity coefficient was calculated as the square root of the reliability coefficient. Table (1) shows The Reliability coefficient (Cronbach's alpha coefficient Alpha) for Section One of the questionnaire "Supply chain flexibility" is (0.779) and Validity coefficient is (0.883). The Reliability coefficient (Cronbach's alpha coefficient Alpha) for Section Two of the questionnaire "Organizational excellence" is (0.787) and Validity coefficient is (0.887). Based on the previous results, it concluded that the study instrument is reliable and valid.

4.2. The descriptive statistical analysis of study variables.

4.2.1. Descriptive statistical analysis of questions related to the independent variable (supply chain flexibility):

Table (2) descriptive statistics, Weighted mean, standard deviation, relative importance, and coefficient of variation for Supply chain flexibility.

Paragraph	Levels [Frequency / Percent]					MEAN	Standard deviation	Coeff. of variation	Rank
	Totally Disagree	Disagree	Neutral	Agree	Totally Agree				
SOURCING FLEXIBILTY									
1	1	2	31	225	142	4.26	0.64	14.97%	3
	0%	0%	8%	56%	36%				
2	1	1	30	207	162	4.32	0.64	14.85%	2
	0%	0%	7%	52%	41%				
3	1	1	28	184	187	4.38	0.65	14.80%	1
	0%	0%	7%	46%	47%				
Manufacturing flexibility									
4	2	2	30	203	164	4.31	0.67	15.62%	3
	0%	0%	7%	51%	42%				
5	1	3	31	195	171	4.33	0.67	15.49%	2
	0%	1%	8%	49%	42%				
6	1	5	24	215	156	4.30	0.66	15.32%	1
	0%	1%	6%	54%	39%				
Distribution flexibility									
7	1	3	38	212	147	4.25	0.67	15.81%	2
	0%	1%	9%	53%	37%				
8	1	5	35	192	168	4.30	0.70	16.27%	5
	0%	1%	9%	48%	42%				
9	1	4	35	198	163	4.29	0.69	15.99%	3
	0%	1%	9%	49%	41%				
10	1	3	38	160	199	4.38	0.71	16.14%	4
	0%	1%	9%	40%	50%				
11	1	3	21	178	198	4.42	0.65	14.72%	1
	0%	1%	5%	44%	50%				
Volume flexibility									
12	1	4	24	207	165	4.32	0.65	15.14%	1
	0%	1%	6%	52%	41%				
13	1	6	26	204	164	4.31	0.68	15.78%	2
	0%	1%	6%	51%	42%				
product flexibility									
14	1	1	29	199	171	4.34	0.64	14.83%	1
	0%	0%	7%	50%	43%				
15	1	4	27	178	191	4.38	0.68	15.49%	2
	0%	1%	7%	44%	48%				
Information system flexibility									
16	1	5	15	195	185	4.39	0.65	14.72%	1
	0%	1%	4%	49%	46%				
17	1	4	26	214	156	4.30	0.65	15.23%	3
	0%	1%	6%	53%	40%				
17	1	5	17	196	182	4.38	0.65	14.89%	2
	0%	1%	4%	49%	46%				
~~General~~	~~1~~	~~4~~	~~24~~	~~198~~	~~174~~	~~4.35~~	~~0.66~~	~~15.19%~~	

Source: researcher based on SPSS Output.

Source: researcher based on SPSS Output.

Table (2) shows the responses of the study sample about the paragraphs related to the independent variable which is "Supply chain flexibility". It was found through the answers that there is a large percentage agreeing with these paragraphs as a whole, and this shown from the general mean row, which is (49 + 44 = 93%) and 6% of the sample gave a neutral answer, while the ratio (1 + 0 = 1%) of the sample size does not agree to these paragraphs, The value of the Standard deviation (0.66) with a percentage less than the general mean value (4.35) to confirm The difference in the ratio of dispersion in the views of the participants for the study sample and the proportion of this dispersion is not large, as the value of the coefficient of variation (15.19%), which confirms the validity of the sample data.

Also, by looking at the values of the coefficient of variation for each of the paragraphs of the question, the paragraphs can be arranged in terms of least dispersion [with the least coefficient of variation] as shown in the Rank column.

Table (3) descriptive statistics, Weighted mean, standard deviation, relative importance, and coefficient of variation for organizational excellence.

Paragraph	Levels [Frequency / Percent]					MEAN	Standard deviation	Coeff. of variation	Rank
	Totally Disagree	Disagree	Neutral	Agree	Totally Agree				
Leadership excellence									
29	1	1	24	193	182	4.38	0.63	14.44%	1
	0%	0%	6%	48%	46%				
30	1	2	28	224	146	4.28	0.63	14.78%	3
	0%	0%	7%	56%	37%				
31	1	5	25	226	144	4.26	0.65	15.27%	4
	0%	1%	6%	56%	37%				
32	1	1	24	184	191	4.40	0.64	14.46%	2
	0%	0%	6%	46%	48%				
Subordinates' excellence									
33	1	4	26	219	151	4.28	0.65	15.18%	2
	0%	1%	6%	55%	38%				
34	1	4	27	190	179	4.35	0.67	15.46%	4
	0%	1%	7%	47%	45%				
35	1	5	17	209	169	4.35	0.64	14.84%	1
	0%	1%	4%	52%	43%				
36	1	5	26	228	141	4.25	0.65	15.31%	3
	0%	1%	6%	57%	36%				
Strategic excellence									
37	1	4	27	185	184	4.36	0.68	15.47%	3
	0%	1%	7%	46%	46%				
38	1	1	22	209	168	4.35	0.62	14.21%	1
	0%	0%	5%	52%	43%				
39	1	3	23	226	148	4.29	0.63	14.65%	2
	0%	1%	6%	56%	37%				
40	1	6	38	198	158	4.26	0.71	16.63%	4
	0%	1%	9%	50%	40%				
Resources excellence									
41	1	5	27	230	138	4.24	0.65	15.34%	1
	0%	1%	7%	57%	35%				
42	1	5	44	180	171	4.28	0.73	16.95%	4
	0%	1%	11%	45%	43%				
43	1	9	24	146	221	4.44	0.73	16.41%	3
	0%	2%	6%	36%	56%				
44	1	2	33	181	184	4.36	0.67	15.47%	2
	0%	0%	8%	45%	47%				
Process excellence									
45	1	4	33	172	191	4.37	0.70	15.97%	2
	0%	1%	8%	43%	48%				
46	1	6	14	177	203	4.43	0.66	14.88%	1
	0%	1%	3%	44%	52%				
47	1	5	34	203	158	4.28	0.69	16.11%	3
	0%	1%	8%	51%	40%				
~~General~~	~~1~~	~~5~~	~~38~~	~~170~~	~~187~~	~~4.34~~	~~0.72~~	~~16.59%~~	

Source: researcher based on SPSS Output.

Table (3) shows the responses of the study sample about the paragraphs related to the dependent variable which is "Organizational excellence ". It was found through the answers that there is a large percentage agreeing with these paragraphs as a whole, and this shown from the general mean row, which is (49 + 44 = 93%) and 6% of the sample gave a neutral answer, while the ratio (1 + 0 = 1%) of the sample size does not agree to these paragraphs, The value of the Standard deviation (0.66) with a percentage less than the general mean value (4.35) to confirm The difference in the ratio of dispersion in the views of the participants for the study sample and the proportion of this dispersion is not large, as the value of the coefficient of variation (15.19%), which confirms the validity of the sample data. Also, by looking at the values of the coefficient of variation for each of the paragraphs of the question, the paragraphs can be arranged in terms of least dispersion [with the least coefficient of variation] as shown in the Rank column.

4.3. Hypotheses testing

4.3.1. One-way analysis of variance (ANOVA) tests.

using these tests to study the extent of agreement of the categories of demographic variables in the sample, where the ANOVA test is used with demographic variables when the number of categories is more than 2.

One-way ANOVA Test To find out whether there is a significant difference in the average opinions between the categories that make up the sample items according to the Education variable about the agreement regarding each of the study variables:

Table (4) shows the One-way ANOVA Test for the study variables according to the Education Variable as follows:

variables	MEAN					F. test	
	High school complete	Bachelor's	Postgraduate	Ms. D	PhD	F	Sig
independent variable	4.338	4.336	4.276	4.346	4.224	0.510	.729
dependent variable	4.385	4.325	4.311	4.336	4.329	.410	.801

Source: researcher based on SPSS Output.

From the One-way ANOVA Test analysis of table (5) found the following:

For the independent variable which is “Supply chain flexibility”:

The value of the significance level is sig = 0.729 greater than 5%. This means that there are no significant differences between the average opinions of each of the categories according to Education variable. Which means that the participants who carry High school complete, the participants who carry Bachelor, the participants who carry Postgraduate, the participants who carry Masters and the participants who carry PhD all agreed Regarding the validity of the independent variable, this because the averages of opinion in the independent variable, are greater than 3.

For the dependent variable which is “Organizational excellence "

The value of the significance level is sig = 0.801 greater than 5%. This means that there are no significant differences between the average opinions of each of the categories according to Education variable. Which means that the participants who carry High school complete, the participants

who carry Bachelor, the participants who carry Postgraduate, the participants who carry Masters and the participants who carry PhD all agreed Regarding the validity of the dependent variable, this because the averages of opinion in the dependent variable, are greater than 3.

One-way ANOVA Test To find out whether there is a significant difference in the average opinions between the categories that make up the sample items according to the Experience variable about the agreement regarding each of the study variables:

Table (5) shows the One-way ANOVA Test for the study variables according to the Experience Variable as follows:

variables	MEAN					F. test	
	less than 5 years	5-10	10-15	15-20	more than 20 years	F	Sig
Supply chain flexibility	4.314	4.315	4.353	4.325	4.326	.267	.899
Organizational excellence	4.369	4.306	4.342	4.334	4.305	.569	.685

Source: researcher based on SPSS Output.

From the One-way ANOVA Test analysis of table (5) found the following:

For the independent variable which is “Supply chain flexibility”:

The value of the significance level is sig = 0.899 greater than 5%. This means that there are no significant differences between the average opinions of each of the categories according to Experience variable. Which means that the participants that have expertise less than 5 years, the participants that have expertise between 5 &10 years, the

participants that have expertise between 10 &15 years, the participants that have expertise between 15 &20 years and the participants that have expertise more than 20 years all agreed Regarding the validity of the independent variable which is " Supply chain flexibility", this because the averages of opinion in the independent variable, are greater than 3.

For the dependent variable which is "Organizational excellence The value of the significance level is sig = 0.685 greater than 5%. This means that there are no significant differences between the average opinions of each of the categories according to Experience variable. Which means that the participants that have expertise less than 5 years, the participants that have expertise between 5 &10 years, the participants that have expertise between 10 &15 years, the participants that have expertise between 15 &20 years and the participants that have expertise more than 20 years all agreed Regarding the validity of the dependent variable which is Organizational excellence, this because the averages of opinion in the dependent variable, are greater than 3.

One-way ANOVA Test To find out whether there is a significant difference in the average opinions between the categories that make up the sample items according to the age variable about the agreement regarding each of the study variables:

Table (6) shows the One-way ANOVA Test for the study variables according to the age Variable as follows:

Variables	MEAN				F. test	
	less than 30 years	30-40	40-50	more than 50 years	F	Sig
Supply chain flexibility	4.327	4.345	4.304	4.337	.392	.759
Organizational excellence	4.327	4.325	4.317	4.370	.420	.739

Source: researcher based on SPSS Output.

From the One-way ANOVA Test analysis of table (6) found the following:

For the independent variable which is "Supply chain flexibility":

The value of the significance level is sig = 0.759 greater than 5%. This means that there are no significant differences between the average opinions of each of the categories according to age variable. Which means that the participants that have age less than 30 years, the participants that have age between 30 &40 years, the participants that have age between 40 &50 years and the participants that have age more than 50 years all agreed Regarding the validity of the independent variable which is " Supply chain flexibility", this because the averages of opinion in the independent variable, are greater than 3.

For the dependent variable which is Organizational excellence

The value of the significance level is sig = 0.739 greater than 5%. This means that there are no significant differences between the average opinions of each of the categories according to age variable. Which means that the participants that have age less than 30 years, the participants that have age between 30 &40 years, the participants that have age between 40 &50 years and the participants that have age more than 50

years all agreed Regarding the validity of the dependent variable which is " Organizational excellence ", this because the averages of opinion in the dependent variable, are greater than 3

4.3.2. path analysis between supply chain flexibility and organizational excellence.

Table (7) shows the paths for the relationships between the study variables.

Hypothesis	path	Standard Path Coefficient	p	Decision
H1	X --->	0.681	0.008***	Supported

Source: researcher based on AMOS Output.
*** Significant at a level of significance less than1%

Table 7 noted that all standard values between the independent variable (Supply chain flexibility) and the dependent variable (Organizational excellence) are significant because their probability values are all less than 1%.

Based on the above, the researcher rejects the null hypothesis and accepts the alternative hypothesis for each of the three main hypotheses of the study, meaning that there is significant relationship between the two variables.

Table 8 shows the paths between each variable and its dimensions.

Path	Standard Path coefficient	p	Decision

X	--->	ax	0.605	0.000***	Supported
X	--->	bx	0.639	0.000***	Supported
X	--->	cx	0.625	0.000***	Supported
X	--->	dx	0.553	0.000***	Supported
X	--->	ex	0.544	0.000***	Supported
X	--->	Fx	0.68	0.000***	Supported
Y	--->	ayy	0.68	0.000***	Supported
Y	--->	byy	0.63	0.000***	Supported
Y	--->	cyy	0.717	0.000***	Supported
Y	--->	dyy	0.647	0.000***	Supported
Y	--->	eyy	0.575	0.000***	Supported

Source: researcher based on AMOS Output.
*** Significant at a level of significance less than1%

The results showed that each dimension of the independent variable, which is (Supply chain flexibility), has a significant effect (P =0.000<0.01 for all dimensions) on the independent variable, therefore the dependent variable will be affected by those dimensions. This leads to the rejection of the sub-hypotheses of, which means that there is a significant effect between the dimensions of the Supply chain flexibility and organizational excellence.

5.findings, discussion, and conclusion

The results of the research conducted in the Egyptian pharmaceutical manufacturing companies show a clear relationship between the supply chain flexibility dimensions and organizational excellence to be directly related.

Regarding H1: This hypothesis is rejected at ($\alpha \leq 0.05$).

The null hypothesis is rejected and accepts the alternative hypothesis that there is a significant impact of supply chain flexibility on achieving organizational excellence.by reviewing the value of the significance level of the test, it was found that it reached (0.000) which is less than 0.05.

This result is in line with the findings of (AlHalaseh and Ayoub, 2021; Siagian et al, 2021; Macclever et al, 2017;Agus, 2011;Babu et al, 2008).

The Egyptian pharmaceutical industry boasts significant growth and faces dynamic market demands. The concepts of flexibility and excellence have been debated in respect to almost every business function. The topic of supply chain flexibility has been the subject of numerous research projects. Any firm can reap many benefits in the Supply chain sector by using flexibility. The concept becomes more important and offers opportunities for in-depth research with an emphasis on technology and analytical techniques, Thus, this study shows that organizational excellence is significantly impacted by supply chain flexibility.

From Testing Hypotheses, it could be concluded the Following:

From testing this hypothesis, it can be concluded that:

- Sourcing flexibility has a significant impact on organizational excellence (leadership, subordinates, strategy, and resources,) in the pharmaceutical manufacturing companies in Egypt.
- Manufacturing flexibility has a significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.
- Distribution flexibility has a significant impact organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt.
- Volume flexibility has a significant impact on organizational excellence (leadership, subordinates, strategy,

and resources) in the pharmaceutical manufacturing companies in Egypt.

- Product flexibility has a significant impact organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt
- Information system flexibility has a significant impact on organizational excellence (leadership, subordinates, strategy, and resources) in the pharmaceutical manufacturing companies in Egypt

Compared to the Previous studies which investigated the complex relationship between supply chain flexibility and organizational excellence, these results have agreed with AlHalaseh and Ayoub ,2021; Holtan et al,2021; Macclever et al ,2017;Urtasun et al, 2014;Babu et al,2008) have agreed upon the effective and direct relation between flexibility and organizational performance.

10.recommendations and limitations

The recommendations could be explained in detail in the following action plan table(9)

Recommendations	Responsibility	KPI	Time
1.Develop Flexible Staffing Models:	Human resources IT, and R&D departments.	Customer-accessible information can be updated. -Quick reaction to evaluations and comments from customers.	6-12 months.

2. Commit to Excellence.	Effective coordination between all departments	Achieving organizational excellence	1-2 years
3. Analyzing current supply chain to find hard and inflexible pieces.	Supply chains department	Achieving flexible supply chains and customer satisfaction.	6 months

Conclusion

The available literature makes it clear that academic scholars have shown a great deal of interest in the subject of Supply chain flexibility (SCF). But most of these efforts have focused on characterizing SCF, pinpointing its dimensions, and creating conceptual models to comprehend its dynamics. This research examined the impact of supply chain flexibility dimensions on organizational excellence in Egyptian pharmaceutical manufacturing companies. The study found that organisations are under increasing pressure to evolve from being recoverable to becoming operationally flexible to achieve organizational excellence. The researcher has created a questionnaire to collect data. The questionnaire's validity and reliability have been tested. The correlation and regression methods were used to test the research hypotheses. The results of this study found that the supply chain flexibility dimensions have a significant impact on achieving organizational excellence. After discussing the results

of the hypotheses of this research, the following is concluded: the results of the analysis showed that supply chain flexibility has a statistically significant positive impact on organizational excellence in Egyptian pharmaceutical manufacturing companies.

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