

DOCTORAL (PHD) DISSERTATION

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**THE IMPACT OF FLEXIBILITY ON COMPANIES
PERFORMANCE: EVIDENCE FROM SMALL AND
MEDIUM PHARMACEUTICAL COMPANIES IN IRAN**

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LIST OF ABBREVIATIONS

BP = British Pharmacopoeia
CF = Coordination Flexibility
CS = Customer Satisfaction
DF = Delivery Flexibility
DU = Demand Uncertainty
FP = Financial Performance
FS = Flowing Stream
JCPOA = Joint Comprehensive Plan of Action
LAP = learning-action performance
MF = Mix Flexibility
MOH = Ministry of Health
NPF = New Product Flexibility
OF = Operational Flexibility
OP= Operational Performance
PDF = Product Development Flexibility
QF = Quality Flexibility
RBV = Resource Based View
RF = Resource Flexibility
SU = Supply Uncertainty
SF = Strategic Flexibility
SAP = Situation-actor process
UN = Uncertainty
VF = Volume Flexibility

CONTENTS

INTRODUCTION.....	3
1 TOPICS AND OBJECTIVES	6
1.1 Aims of the Research	6
1.2 The Objectives of The Research	6
1.3 Research Questions	6
1.4 Dissertation Structure.....	7
1.5 Research Hypotheses	7
2 THE RESULTS OF THE RESEARCH	12
2.1 Results of regression analysis.....	12
2.2 Results of moderation analysis.....	13
3 CONCLUSIONS AND RECOMMENDATIONS.....	15
3.1 Conclusion	15
3.2 Recommendations.....	19
3.3 Research limitations.....	21
4 THE MAIN CONCLUSION AND NOVEL FINDINGS.....	22
SUMMARY.....	24
REFERENCES.....	26
List of Figures.....	30
List of tables.....	30

INTRODUCTION

Since 1896 performance and uncertainty have been strongly present in management and economics literature (Ross, 1896). DiFonzo and Bordia (2002) mentioned that uncertainty cannot be accurately understood because it is a result of unforeseen circumstances, but it is possible to reduce environmental uncertainty by using strategic actions that lead to higher levels of company performance. Here, we can refer to flexibility at the strategic level as one of those strategic actions. Moreover, environmental uncertainty as a result of a lack of familiarity with new markets is considered a serious threat to companies' survival because of their inability to predict or control environmental changes, which affect companies' ability to acquire the required resources for continued production (Bendickson et al, 2018). Thus companies should find a relevant way to deal with uncertainty in dynamic environments.

According to Newman et al (1993), uncertainty which emerges from external or internal sources has become a real concern for organizations, especially in a dynamic business environment, so successful companies should think about finding a technique to enhance their performance when confronted with new preferences of customers, and unpredictable and uncertain events, such as unstable supplies of raw materials or fluctuations in demand. As a solution to deal with uncertainty Swamidass (1988) suggested that manufacturing flexibility is the best technique to deal with uncertain situations, because of its importance to respond quickly to unexpected cases; in this regard, he defined flexibility as a "manufacturing system's ability to adjust effectively to the changes of the environmental conditions". Also, strategic flexibility has been suggested as a technique to cope with turbulence in business environments (Evans, 1991; Sanchez 1995, 1997).

Flexibility is considered an essential condition to enhance operational performance (Suarez et al, 1991; Pagell and Krause, 2003). In the same context, Silva and Ferreira (2017) found that uncertainty significantly affected the decision of the company to adopt flexibility because it affects operational performance as well; moreover, they suggested using flexibility as a moderating mechanism to reduce the effect of uncertainty on companies' performance. Also, Ketokivi (2006) reported that the kind and level of strategic flexibility which is used should be correlated with the degree of environmental uncertainty as presumed by managers. Sánchez and Pérez (2005) and Merschmann and Thonemann (2011) mentioned that flexibility relates

to the uncertainty of the situation; for example, in uncertain environments, increased flexibility positively affects and improves company performance, whereas in more stable environments, a high level of flexibility leads to higher costs than lower financial performance. From Volberda's (1998) and Miller and Shamsie's (1996) perspectives, flexibility has a major effect on companies' performance in an unstable environment.

Much research related to flexibility and its relationship with performance has focused on financial performance (e.g. Nair, 2005; Sánchez et al, 2005; Arawati, 2011; Merschmann and Thonemann, 2011). However, other kinds of non-financial performance measurements should be considered, such as customer satisfaction (Vickery et al, 1999; Lummus et al, 2005) (Camisón and Villar Lopez, 2010). In the same context, Sáenz et al (2018) mentioned that manufacturing flexibility is an important mechanism, especially in dynamic environments, where the needs and preferences of customers are changing continuously. And as a competency, it helps companies to enhance their performance (Narasimhan et al, 2004). Moreover, Upton (1994) considered flexibility a critical capability that enables companies to achieve good performance by improving their ability to respond to changes quickly.

Many researchers have investigated the link between operational flexibility and companies' performance; for example, Sáenz et al (2018) highlighted the importance of flexibility in the context of contingency, and found that manufacturing flexibility strongly effects the performance of companies, especially in light of changes in customer preferences. Also, Grawe et al (2011), in the context of logistics, mentioned that operational flexibility enhances and increases the level of companies' performance. Moreover, many researchers have emphasized that operational flexibility is an essential mechanism which improves performance (Slack, 1983 ; Swamidass and Newell, 1987; Slack and Correa, 1992; Vokurka and O'Leary-Kelly, 2000 ; Yu et al, 2015; Chahal et al, 2018). However, Pagell and Krause (1999) and Fiegenbaum and Karnani (1991) could not find a significant relationship between flexibility and companies' performance. Furthermore, researchers such as Gupta and Somers (1996) and Jack and Raturi (2002) stated that flexibility is not necessary to drive performance positively and significantly. Business environments have become complicated because of the increasing level of uncertainty due to customer preferences changing, demand fluctuations, and misalignments between the capacity of production and demand realized. Moreover, small and medium-sized enterprises (SMEs) face a critical problem, which is the inability to offer products/services on time and in the optimal way to meet customers' needs (Peláez and Ruiz, 2001), and the inability to reduce the negative effect of demand fluctuations, and to improve and offer new products more

quickly, all of which are considered important issues in the light of intense competition in the market (Gaimon and Singhal, 1992). Such circumstances have been considered justifications for manufacturing flexibility.

According to Gerwin and Tarondeau (1982), Zang and Doll (2001), there are many reasons for environmental uncertainty, such as market fluctuations, technological turbulence, and intense competition. The contemporary literature of flexibility missed the impact of flexibility on customer satisfaction and focused on other measurements of performance (Pérez et al, 2016). This is an important issue since both customers and other stakeholders affect the financial performance of the company (Sáenz et al, 2018). So, we believe that flexibility should be investigated in terms of how it adds value for customers.

Managers need to be mindful of the causes of uncertainty to discover the optimal way to control the changes that occur because of uncertainty. In addition, market turmoil has demonstrated the changes in consumer expectations for products and services. Because of this, many new products have appeared due to changing demand. For this reason, companies try to adapt to changes by using both strategic and operational flexibility as techniques to deal with uncertainty and enhance performance.

Flexibility as a technique to deal with uncertainty enables companies to acquire flexible resources and then coordinate these resources in an optimal way to offer new products (new product flexibility), producing different amounts of products to meet demand variations (volume flexibility). Moreover, they can offer a wide range of products to fulfil customers' requirements (mix flexibility).

Based on what has been mentioned previously, this research tries to examine the effects of both strategic flexibility and operational flexibility on the performance of small and medium-sized pharmaceutical companies in Iran, and considers the moderating role of environmental uncertainty on this relationship. The research intends to enhance the competitiveness of these companies in the market by implementing strategic and operational flexibility which help them to improve their efficiency in tackling both supply uncertainty and demand uncertainty.

1. TOPICS AND OBJECTIVES

1.1 Aims of the Research

The thesis aims to highlight the interaction between strategic flexibility and operational flexibility and how they can affect companies' performance, and considers environmental uncertainty as a moderator in understanding the moderating effect of uncertainty on the relationship between flexibility and companies' performance.

The main focus starts from the importance of the synergistic relationship between strategic flexibility and operational flexibility as mechanisms to cope with unexpected circumstances, and how strategic flexibility can be viewed from an operational perspective. In other words, using strategic dimensions of flexibility which directly affect operations and the operational dimensions of flexibility at industrial companies, and using a moderator effect for a better explanation of how flexibility affects companies' performance.

1.2 The Objectives of The Research

This research aims to achieve the following objectives:

1. The main objective of this research is to investigate the effect of flexibility on the performance of small and medium-sized pharmaceutical companies in Iran.
2. To identify the effect of strategic flexibility on companies' performance.
3. To identify the effect of operational flexibility on companies' performance.
4. To identify the moderating effect of uncertainty on the relationship between strategic flexibility and companies' performance.
5. To identify the moderating effect of uncertainty on the relationship between operational flexibility and companies' performance

1.3 Research Questions

Based on the research objectives the following research questions were formed, and these questions will be the guide to achieve the results of the empirical study:

1. How flexibility affects companies' performance?
2. How strategic flexibility affects companies' performance?
3. How operational flexibility affects companies' performance?
4. How uncertainty could moderate the relationship between strategic flexibility and companies' performance?

5. How uncertainty could moderate the relationship between operational flexibility and companies' performance?

1.4 Dissertation Structure

The study is organized in 6 chapters, as follows:

Chapter 1: Defines the subject of the thesis, the objectives, research questions, and research hypotheses.

Chapter 2: Offers a review of the literature related to the topic of the thesis, and offers a theoretical background about the variables and how they connect with each other, in an attempt to provide a comprehensive theoretical understanding of the topic.

Chapter 3: Illustrates the methodology of the study, and the analysis methods used to meet the objectives of the research, the research variables, study population and sampling technique, data collection and questionnaire adaption, and data analysis techniques employed to obtain the results.

Chapter 4: Shows the results of the study and the evaluations of these results. It is an exhaustive analysis of the effect of the flexibility variables on the performance variables and how the moderator variable can affect this relationship.

Chapter 5: Provides the conclusions of the study. Depending on the conclusions of the study, recommendations will be made at the end, along with a discussion of the limitations of the research and the directions for future research.

Chapter 6: Shows the findings of the study and the conclusion of the thesis.

All the appendices, a list of figures, tables, publications, and references which are related to the study are available at the end of this thesis.

1.5 Research Hypotheses

Many studies have referred to the link between flexibility and company performance and how flexibility as a mechanism can enhance company performance in uncertain business environments.

1. In the framework of the relationship between SF and company performance, Aaker and Mascarenhas (1984) defined SF as an organizational capability to react in perfect time to serious environmental fluctuations which affect an organization's performance. For example, Daniels et al (1996, 2004) found that effective allocation and utilization of RF helps companies to improve operational performance. But according to Oke (2005) the link between RF and

customer satisfaction is still unclear. In this context, Chauhan and Singh (2014, p. 33) mentioned that RF can be used to offer a variety of products, including novel products, and to meet the demand of consumers more quickly.

Yuan et al (2010) mentioned that SF affects a company's performance, especially in a context of hyper-competition. But Pagell and Krause (2003) mentioned that companies that apply flexibility in a stable environment which does not have real changes will bear higher financial costs.

Miles et al (1978) also mentioned that SF enhances company performance by integrating with other managerial strategies such as good communications, and the synergy between production strategies and marketing plans. Moreover, Grewal and Tansuhaj (2001) clarified that the valuable benefits of SF can be noted after a crisis, especially in contexts of technological turbulences and demand fluctuations.

Moreover, from the customer satisfaction side, RF has an impact on customers through their willingness to pay for products or services, in other words, the expected benefits of the product versus its price (Chod and Rudi, 2005).

Based on what has been mentioned above, we can formulate the first main hypothesis and the related sub-hypotheses:

H1: Strategic flexibility positively affects the performance of pharmaceutical SMEs in Iran.

H1a: Recourse flexibility positively affects the performance of pharmaceutical SMEs in Iran.

H1b: Coordination flexibility positively affects the performance of pharmaceutical SMEs in Iran.

2. In the context of the relationship between operational flexibility and company performance, Scherrer-Rathje et al (2014) and Sáenz et al (2018), identified OF as one of the features of prosperous companies. It considered one of the most important types of organizational flexibility at the operational level, and it refers to companies' ability to reconfigure the available resources to offer a variety of products in order to adapt and react to uncertainty and market fluctuations, and as a result, achieve better performance in exceptional situations (Gerwin, 1993; Slack, 2005).

Moreover, Chod and Rudi (2005) mentioned that manufacturing flexibility implementation leads to reduced costs. Thus, OF may positively affect financial performance by enhancing profitability when costs are lower. In the framework of operation management, Newman et al

(1993) defined manufacturing flexibility as a basic mechanism to cope with uncertainty and enhance company performance.

As a type of operational flexibility, VF is considered a mechanism to enhance performance and obtain a competitive advantage through customer satisfaction, and it is not a final goal but rather a method to achieve the final goal for the company (Oke, 2005). Also, many researchers have shown that VF impacts a company's performance positively (Kekre and Srinivasan, 1990; Suarez et al, 1996; Vickery et al, 1999). Moreover, it reduces demand uncertainty by controlling production size to meet demand fluctuations in urgent cases (Goyal and Netessine, 2011). It also directly affects customers' perceptions by meeting their needs at any time (Vickery et al, 1999), which will lead rationally to increased customer satisfaction.

Moreover, mix flexibility as a kind of affects the profitability and market share of a company positively (Kekre and Srinivasan, 1990; Suarez et al, 1996). In addition to this, Kekre and Srinivasan (1990) mentioned that there is a link between the success of the company as represented by obtaining more profits and a bigger market share, and the ability to offer a variety of products without high costs. Similarly, Suarez et al (1996) clearly noted that MF means a wide range of products at a particular moment. MF also helps companies to offer the required products which meet customers' needs and preferences (Zhang et al, 2003; Sáenz et al, 2018) consequently, this will lead to customer satisfaction.

In the context of PDF, Cottrell and Nault (2004) found that introducing new products positively affects company performance because of increasing product diversity, while Suarez et al (1996) mentioned that providing modern products has become essential for many industries, especially with rapid technological advances and changes in customers' preferences, and so. Therefore introducing new products can give company a significant competitive advantage.

Based on what has been discussed above, we can formulate the second main hypothesis and the related sub-hypotheses:

H2: Operational flexibility positively affects the performance of pharmaceutical SMEs in Iran.

H21a: Mix flexibility positively affects the performance of pharmaceutical SMEs in Iran.

H2b: Volume flexibility positively affects the performance of pharmaceutical SMEs in Iran.

H2c: Product development flexibility positively affects the performance of pharmaceutical SMEs in Iran.

3. Environmental uncertainty can be divided into three basic kinds, which are: supply uncertainty, demand uncertainty, and technological uncertainty (Davis, 1993).

In the current study, we try to investigate how environment uncertainty represented by demand uncertainty and supply uncertainty can moderate the link between flexibility and companies' performance.

DU indicates demand fluctuations. This means the changing amounts of products and the time of demand, whereas supply uncertainty relates to suppliers, it reflects supply fluctuations and the unpredictability of both the quantity and timing of supply (Fynes et al, 2004). Strategic flexibility is considered an essential mechanism for responding to environmental changes and a core factor that helps companies survive and succeed in markets that experience intense competition (Yuan et al, 2010). Due to the importance of flexibility as a mechanism to cope with uncertainty and respond to environmental changes (Gerwin,1993; Sawhney, 2006; Chahal et al 2018) and its role in company performance, we will investigate the link between SF and company performance and test the moderating effect of uncertainty on this relationship.

Based on what has been mentioned above, we can form the third main hypothesis:

H3: Uncertainty moderates the relationship between strategic flexibility and the performance of pharmaceutical SMEs in Iran.

4. Flexibility can be seen from two basic sides, firstly as a capability in itself, and secondly as a powerful factor offering the manufacturing system the ability to react fast to market changes and acquire a competitive advantage (Hallgren and Olhager, 2009). In the case of environmental uncertainty, De Toni and Tonchia (1998) and Jack and Raturi (2002) considered flexibility an absorber for uncertainty. Also, it is a kind of reaction to uncertain situations (Swamidass and Newell, 1987).

In the field of operations management, many researchers have referred to the fact that uncertainty is a source of instability for businesses and in a hyper changing business environment a high degree of uncertainty will motivate companies to concentrate more and more on flexibility in the supply chain (Vickery et al, 1999).

Operational flexibility helps companies to decrease the economically negative consequences of the difference between demand and supply by enabling them to reallocate their capacity according to changing demand (Goyal and Netessine, 2011).

Based on what has been mentioned above, we can formulate the fourth main hypothesis:

H4: *Uncertainty moderates the relationship between operational flexibility and the performance of pharmaceutical SMEs in Iran.*

The following (Figure 1-1) summarizes the previous hypotheses and the directions between research variables.

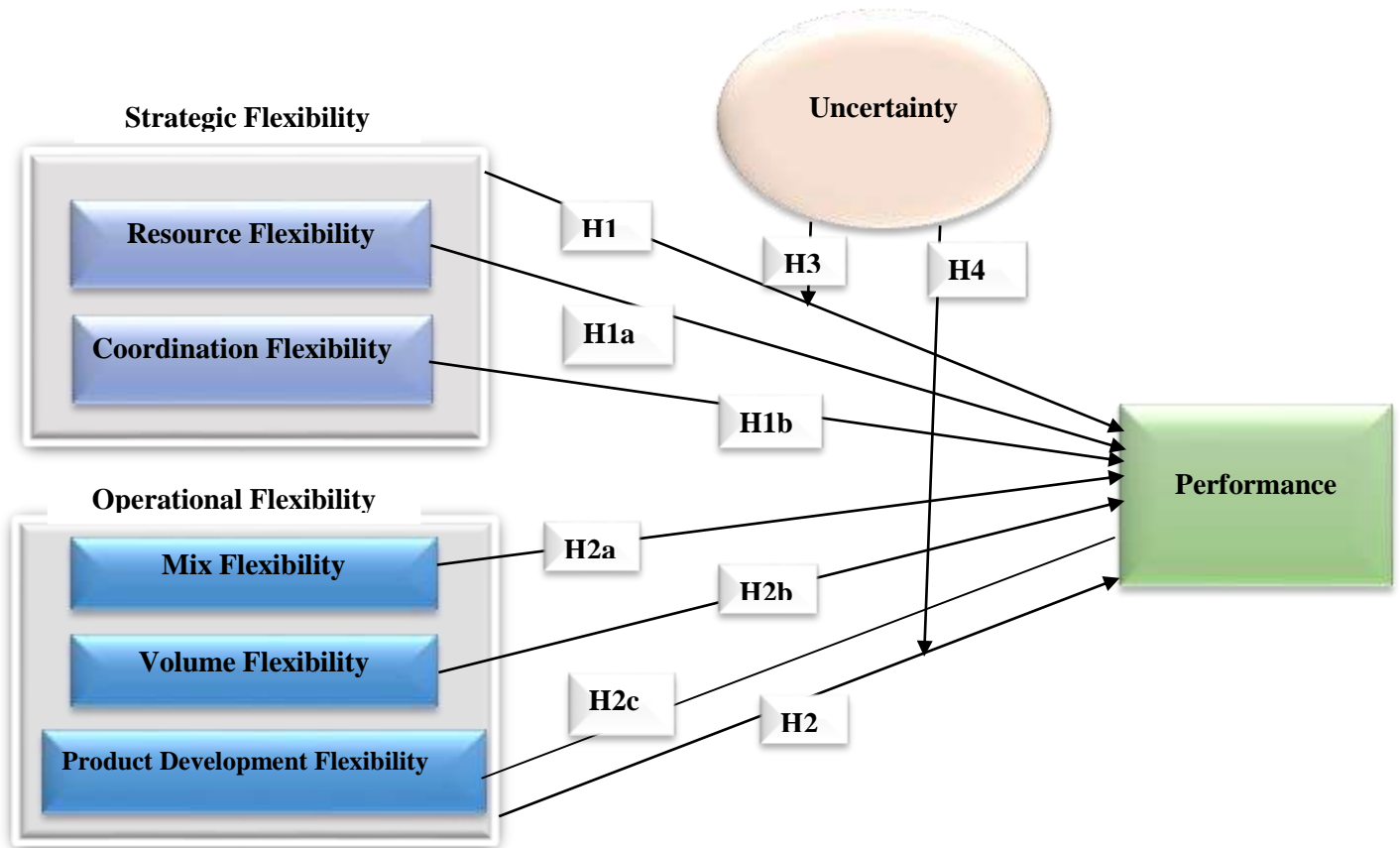


Figure 1-1: Research model

Source: Authors' based on hypotheses development (2019)

2. THE RESULTS OF THE RESEARCH

2.1 Results of regression analysis

In order to test the first and second main hypotheses and the sub-hypotheses are related to, linear regression analysis was used to investigate the causal relationship between strategic flexibility and companies' performance, and operational flexibility and companies' performance.

Table 2 – 1: Regression results of different dimensions of flexibility – Total performance

	Dependent Variable	
	Performance	Performance
Independent Variables	Model 1	Model 2
Constant	0.784 ***	0.911 ***
RF	0.534 *** (0.418)	
CF	0.244 *** (0.253)	
MF		0.080 (0.084)
VF		0.296*** (0.313)
PDF		0.377*** (0.402)
R	0.582	0.702
Adjusted R ²	0.332 (33.2%)	0.485 (48.5%)

Levels of significance: *p < 0.1; **p < 0.05; ***p < 0.001

Source: Author's Calculation (2019)

According to the results in Table 2-1, strategic flexibility effects company performance positively, and strategic flexibility explains 33.2% of performance variance.

Also, operational flexibility effects company performance positively, and operational flexibility explains 48.5% % of performance variance

Depending on the summarized results in Table 2-1, we can agree with the first main hypothesis, i.e. that “strategic flexibility positively affects the performance of SME pharmaceutical companies in Iran”.

Also, we can accept the second main hypothesis that “operational flexibility positively affects the performance of SME pharmaceutical companies in Iran”.

(Figure 2-1) summarizes the effect of different dimensions of flexibility on the performance of SME pharmaceutical companies in Iran.

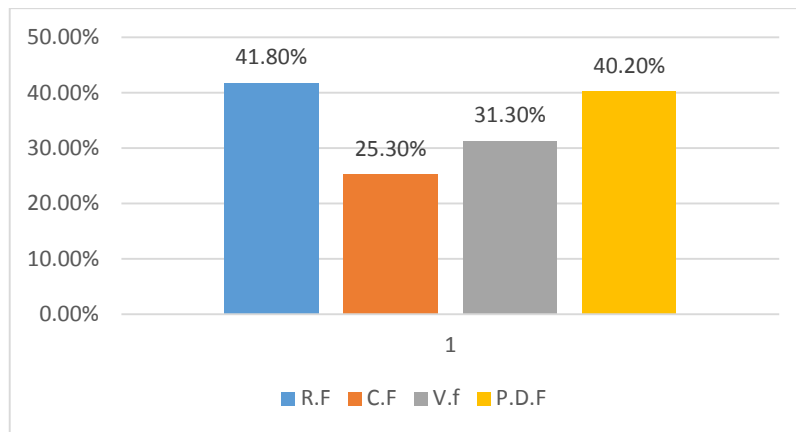


Figure 2- 1: The Effect of Flexibility Dimensions on Companies' Performance

Source: Author's Calculation (2019)

- Resource flexibility affects the performance of SME pharmaceutical companies in Iran positively, and it has the highest impact on performance 41.8% (H1a is accepted).
- Product development flexibility affects the performance of SME pharmaceutical companies in Iran positively, it ranks second in terms of impact on performance 31.3%. 40.20% (H2c is accepted).
- Volume flexibility affects the performance of SME pharmaceutical companies in Iran positively, it ranks third in terms of impact on performance 31.3% (H2b is accepted).
- Coordination flexibility affects the performance of SME pharmaceutical companies in Iran positively, and it has the lowest impact on performance 25.3% (H1b is accepted).
- Mix flexibility does not affect the performance of SME pharmaceutical companies in Iran (H2a is rejected).

For more details, (Figure 2-2) shows more details about the relationship between different dimensions of flexibility and different dimensions of performance.

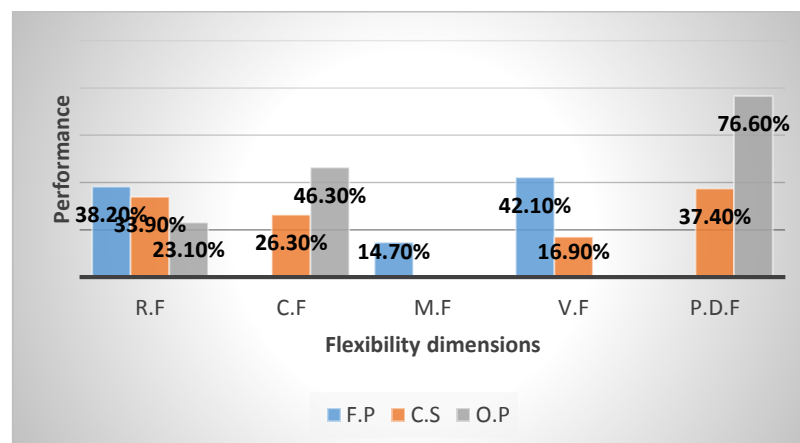


Figure 2: The Effect of Flexibility Dimensions on The Dimensions of Companies' Performance

Source: Author's Calculation (2019)

2.2 Results of moderation analysis

2.2.1 The Moderating Effect of Uncertainty on the Relationship Between Strategic Flexibility and Performance

Table 2-1 shows the result of the moderating effect of uncertainty on the link between SF and the performance of SMEs Pharmaceutical companies in Iran.

Table 2-2: The Results of Moderated Regression Analysis (Uncertainty as Criterion)

	β	R	R ²	T	P
Constant	8.54*** [3.56 , 13.51]			3.381	0.0009
SF	-1.6775*** [-2.96 , - 0.38]	0.6906	0.4769	-2.561	0.0111
Uncertainty	-1.97*** [-3.37 , - 0.566]			-2.76	0.0062
SF * Un	0.62*** [0.265 , 0.98]		0.0272***	3.41	0.0008

Levels of significance; *p < .01, **p < .05, ***p < .001

Source: Based on Author's Calculation (2019)

This result shows that in uncertain situations if the pharmaceutical companies use strategic flexibility as a mechanism to deal with uncertainty it will reflect positively on their performance. So in uncertain business environments when companies carry out strategic flexibility, the performance of these companies will be improved due to the fact that flexibility is an effective technique to adapt to an uncertain environment. So, the third main hypothesis “uncertainty moderates the relationship between strategic flexibility and performance of SMEs pharmaceutical companies in Iran” is accepted.

The following (Figure 2-3) shows the moderating effect of uncertainty on the relationship between strategic flexibility and performance, at different levels of uncertainty.

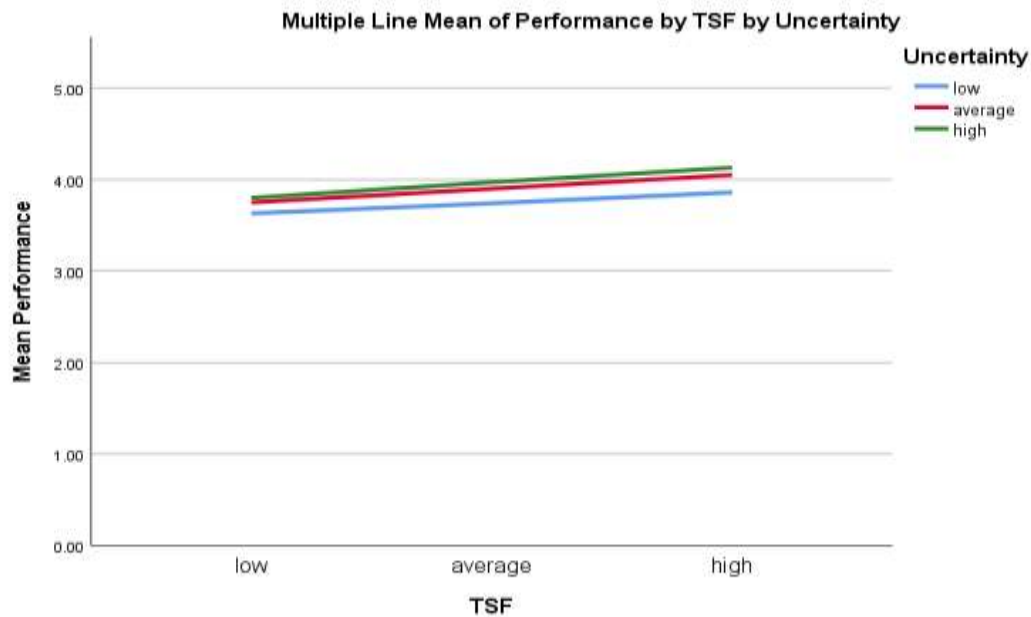


Figure 2-3: The Moderating effect of uncertainty on the relationship between strategic flexibility and companies’ performance

Source: Author’s Calculation (2019)

2.2.2 The Moderation Effect of Uncertainty on the Relationship between Operational Flexibility and Performance

According to Table 2-2, we can note that there is no effect of uncertainty as a moderator variable on the link between OF and companies' performance because all P values > .01. Moreover, we can note that (0) value is located in the following ranges [-1.4827, 6.0034] [-.7857, 1.158] [-1.2616, .7719] [-.1407, .3788]. So, the fourth main hypothesis “uncertainty moderates the relationship between operational flexibility and performance of SMEs pharmaceutical companies in Iran” is rejected.

Table 2-3: Moderated Regression Analysis (Uncertainty as Criterion)

	β	R	R ²	T	P
Constant	2.2604 [-1.4827 , 6.0034]			1.19	0.2353
OF	.1866 [-.7857 , 1.158]	0.7052	0.4974	.3781	0.7057
Uncertainty	-.2448 [-1.2616 , .7719]			-.4754	0.6356
OF * Un	.1191 [-.1407 , .3788]		0.0018	.90310	.03674

Source: Author’s Calculation (2019)

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusion

In a hyper-changeable business environment, businesses should try to manage all these changes and respond to them by being agile and trying to control unexpected situations as much as they can. As a result a company will be able to deal with uncertain situations, avoid threats and grab opportunities. Flexibility relies on two fundamental elements: first, the speed of reaction, second, the availability of information in uncertain situations.

In general, the results indicate that Iranian SME pharmaceutical companies work in an uncertain business environment, and they carry out both SF and OF as mechanisms to deal with uncertain situations. The performance of these companies is rated as good. Both SF and OF effect positively the performance of SME pharmaceutical companies in Iran.

Strategic flexibility, represented by RF and CF, affects positively and significantly the performance of SME pharmaceutical companies in Iran, and this result matches the results of Chauhan and Singh (2013, p.33) that resource flexibility is a way to meet customers' demands faster, will lead to customer satisfaction, and will enhance the financial performance of the company (Chod and Rudi, 2005; Yuan et al, 2010). It also matches the results of Daniels et al (2004) who found that an effective allocation and utilization of resource flexibility helps companies to improve performance.

Environmental uncertainty moderates the link between SF and the performance of target companies but does not moderate the link between OF and the performance of those companies.

SF and OF as mechanisms to deal with uncertainty can be integrated together and work synergistically to improve the performance of SMEs pharmaceutical companies in Iran, and strategic flexibility works as an umbrella for operational flexibility, which means that when strategic flexibility represented by resource flexibility and coordination flexibility exists, it will reflect positively on performance and it is a realistic mechanism to cope with external environmental uncertainty which is represented by supply uncertainty and demand uncertainty. When resource flexibility is high and affects company performance positively, these companies will have good techniques to deal with different suppliers and obtain the required resources for production processes. Despite the importance of resource flexibility in enhancing companies' performance, there is no benefit if the company cannot manage the available resources in an economical way to reach the optimal level of resource usage, because resources are limited and they should be used rationally. Consequently, coordination flexibility will be a perfect

mechanism to achieve this, especially when the outcomes clarify that CF positively effects the performance of SME pharmaceutical companies in Iran.

The dimensions of operational flexibility which are considered in the current study are in harmony with the dimensions of strategic flexibility; for example, MF and VF and PDF are directly related to manufacturing processes and at the same time to the available resources and how to use them efficiently, and the results have shown that VF affects companies' performance positively. This is a logical result because volume flexibility refers to a company's ability to modify the production size (increase or decrease) to meet demand fluctuation, in this case to meet customer needs on the time, which will lead to customer satisfaction, and as a result, more profits when the sales are higher. On the other hand, it will act as a guarantee to avoid increasing variable costs when demand is low by controlling the level of production. This result matches Oke's (2005) result, which found that VF is not the final goal of companies, but is rather a technique that enables companies to acquire a competitive advantage by achieving CS, especially if the company uses an effective delivery system. Moreover, many researchers, such as (Kekre and Srinivasan, 1990; Suarez et al, 1996; Vickery et al, 1999; Goyal and Netessine, 2011 and Sáenz et al, 2017) mention that volume flexibility positively affects a company's performance because it allows an increase in production in response to unexpected customer preferences and this enhances CS.

Product development flexibility effects companies' performance positively as well, because it is related to meeting customer needs, and if the company is customer-oriented this automatically means an increase in customer satisfaction, and an increase in sales and profits as well. The current study shows that PDF positively affects both the FP and CS of the target companies. In this context, Cottrell and Nault (2004) found that introducing new products or developing current products to meet the new trends of consumption affects company performance positively because it creates increased product diversity, whereas dependence on traditional current products leads to low company performance.

Mix flexibility effects company performance positively, but it is not a significant effect ($P > 0.1$), so it was ignored. We can justify this by the great effect of both VF and PDF on company performance when companies modify their production and develop current products to meet customer needs, which will enhance their performance, Moreover, MF means many production lines which are difficult and costly for small and medium-sized companies, but much easier for larger companies which have the capital to set up many production lines and then create a wide mix of products. In detail, mix flexibility only affects financial performance and this effect was

significant, and this result matches Suarez et al, 1996, and Kekre and Srinivasan, 1990; in their opinion mix flexibility affects profitability and market share positively.

We can say that Iranian pharmaceutical SMEs are flexible and they have information about the market; because of this they control the negative effect of uncertainty and this is reflected positively in their performance.

Consequently, directors must have the ability to determine various methods to obtain the required information about the market and its components, and understand how they can use this information in an optimal way, and choose the best time to respond to market changes and uncertain situations to avoid threats and grasp opportunities in the face of massive competition.

We provide empirical evidence that both operational and strategic flexibility improve the (financial – non-financial) performance of small and medium-sized companies. Dynamic business environments present great opportunities as well as threats, so companies should be careful about their performance, and they should find the best techniques to avoid threats and exploit opportunities, especially in the context of intense competition; this aspect was not considered in this study, but will be a recommended area for future research. Moreover, the link between OF, SF, and performance still needs further investigation and effort so that researchers and managers can be aware of how they can use their findings efficiently to enhance company performance, especially in the light of the high cost of applying different choices and moving from one plan to another in uncertain situations. The results showed that the positive effects of SF and OF on financial performance are the less than the effect of SF and OF on other types of performance because flexibility as a mechanism is costly and this result matches the perspective of Das and Elango (1995).

Finally, SF and OF are key mechanisms for effective performance in uncertain situations, but they are not a miracle solution to enhance company performance; they must be applied in synergy with other strategies and techniques.

The following Table 3-1 summaries the results of hypothesis testing. Based on it, three main hypotheses are accepted, one main hypothesis is rejected. Regarding the sub-hypotheses, 4 sub-hypotheses, are accepted, whereas one sub-hypothesis is rejected.

Table 3-1: Summary of Quantitative Study Results

N	Hypotheses	Result
1	Strategic flexibility positively affects the performance of pharmaceutical SMEs in Iran	Accepted
	A: Resource flexibility positively affects the performance of pharmaceutical SMEs in Iran	Accepted
	B: Coordination flexibility positively affects the performance of pharmaceutical SMEs in Iran.	Accepted
2	Operational flexibility positively affects the performance of pharmaceutical SMEs in Iran.	Accepted
	A: Mix flexibility positively affects the performance of pharmaceutical SMEs in Iran.	Rejected
	B: Volume flexibility positively affects the performance of pharmaceutical SMEs in Iran.	Accepted
	C: Product development flexibility positively affects the performance of pharmaceutical SMEs in Iran.	Accepted
3	Uncertainty moderates the relationship between strategic flexibility and the performance of pharmaceutical SMEs in Iran.	Accepted
4	Uncertainty moderates the relationship between operational flexibility and the performance of pharmaceutical SMEs in Iran.	Rejected

Source: The author's based on the results

3.2 Recommendations

Regarding the previous results, this study has many recommendations and implications for implementing flexibility and its role in enhancing company performance in the light of environmental uncertainty.

This study presents a framework featuring two main types of flexibility - strategic and operational -, and their synergistic impact on enhancing the performance of pharmaceutical companies operating in what is considered one of the most important economic sectors in Iran.

Regarding the managers

One of the most important implications of this study is for managers at small and medium-sized pharmaceutical companies in Iran, i.e. for their way of thinking, by drawing their attention to the valuable role of flexibility as a dual mechanism to improve company performance and deal with environmental uncertainty, and how they can apply flexibility from strategic and operational perspectives, in order to obtain the required results. To do this requires reconfiguring the managerial policies at these companies, thinking out of the box and expanding their vision for the future of their companies. Moreover, there is a need to introduce flexibility as a business culture for managers, by showing the positive effect of flexibility on different dimensions of performance. Because if the company uses the same techniques for a long time in a rapidly changing business environment, it will necessarily be a reason for it to drop out of the market. Managers themselves must be flexible in their attitudes and ways of planning so as to be able to implement flexibility as a strategic and operational mechanism to deal with an unexpected situation and react to unpredictable cases in the appropriate time.

Regarding the production processes

Pharmaceutical companies in Iran have to work more and more in the field of R & D to improve production methods and to be able to produce drugs for chronic diseases, which are currently imported from other countries. By producing such drugs, companies will be able to enhance the impact of MF on performance, because the results show that the effect of MF on company performance is currently not significant. In other words, the target companies in Iran should widen the variety of drugs available by using mix flexibility.

Due to sanctions, pharmaceutical companies in Iran must think about outsourcing flexibility to solve the problem of acquiring the raw materials required to produce more pharmaceutical products and enhance the product mixture.

Recommendation for the production costs

Companies should be careful about the cost of production of the new products, or develop their current products and carry out feasibility studies before making the decision to produce or launch novel products on the market, because in the case of the failure of a new product, the costs will be higher, despite applying flexibility, because flexibility as a mechanism is costly, especially when a company wishes to change from one strategic choice to another. This is clear from the result that showed that the impact of SF on FP was positive and significant, but had the least effect when compared to the effect of flexibility on other dimensions of performance.

Regarding the harmony between flexibility and other marketing techniques

Inevitably, flexibility is an effective method to cope with urgent situations, but it is not a magic key to maximize profits and enhance performance or solve problems immediately. It must be introduced in synergy with other management practices, such as market research, managing the supply chain efficiently and adopting marketing techniques to get the best results from it.

Small and medium-sized pharmaceutical companies in Iran should be careful about competitors' actions because the large companies in the same industry are very strong and they have a higher proportion of sales. So the target companies must be market-oriented by using both MARKOR (intelligence generation, intelligence dissemination, and responsiveness) and MAKTOR (customer orientation, competitor orientation, and inter-functional coordination) measures of market orientation, because if a company is not market-oriented then it is impossible to be flexible and apply flexibility as a mechanism to deal with uncertainty or respond to market changes.

Flexibility as a response to market changes represents the final step of market orientation "responsiveness", because strategic flexibility could be proactive and reactive, and the importance of being market-oriented is summarized by obtaining information about the market. Without being competitor-orientated, companies will not be able to react to competitors' actions in time.

Regarding government policies

The Iranian MOH should modify the pricing policy of pharmaceutical products because it is not possible for pharmaceutical companies to produce novel products unless the price increases favourably, and here, the Iranian MOH can work in parallel to protect people against the high price of drugs by an insurance program, and at the same time provide pharmaceutical companies with some margins to increase the prices within a reasonable range.

Regarding the development of existing products, there are many restrictions, because all the pharmaceutical companies are working under the regulations of B.P. (British Pharmacopoeia), which is an organization responsible for determining and defining the formula of each pharmaceutical product, and no company can make any basic changes to develop existing products unless the B.P. agrees. So, in this case, introducing new product flexibility is a much more workable solution than product development flexibility. The MOH in Iran need to find a way to deal with such restrictions by trying to renew and modify the agreements with the international parties in order to allow the Iranian pharmaceutical companies to innovate and

produce new pharmaceutical products which are needed to the local, regional and international markets.

3.3 Research Limitations

Like other research, this study has many limitations.

In the beginning, the study considered one manufacturing sector, i.e. pharmaceutical companies, and moreover, it only dealt with SMEs. So for future studies, researchers can consider large companies as well, and make a comparative study between different industrial sectors to investigate the impact of flexibility on performance, because this relationship still needs much investigation.

Second, the current study used two dimensions of SF, and three dimensions of OF. Other researchers can use different dimensions from a different perspective, and environmental uncertainty and performance can be considered from different perspectives by using different dimensions of both of them. Moreover, different factors can be considered as moderators or mediators for this relationship.

Third, this study considered Iran as a country; future studies can make comparative studies between different countries because different countries mean different business environments, different sources of uncertainty, and logically different results.

Fourth, this study is a cross-sectional one, so perhaps a larger research project could use long term series to make comparisons based on time differences.

Finally, it would be beneficial to consider the synergistic effect of another practice, such as market orientation with flexibility to enhance company performance.

4. THE MAIN CONCLUSION AND NOVEL FINDINGS

The main goal of this thesis was to investigate the relationship between flexibility and company performance and consider the moderating effect of uncertainty on this relationship.

The new element in this study is testing the theoretical model and linking it to the empirical study by considering the synergy between strategic and operational flexibility on company performance and moderating it by using uncertainty as a moderating variable, which has not been tested before.

- The main outcomes of the research can be summarized in a basic sentence: “When a company applies flexibility as a strategic and operational mechanism, this will lead to an enhancement of its performance, especially in the light of environmental uncertainty”.
- The link between SF and company performance can be more effective in the light of environmental uncertainty, where uncertainty moderates this relationship. Since SF is related to the external business environment it is logical that resources and the way they are used are affected by the uncertainty which derives from the external environment. And the evidence is clear that resource flexibility has the greatest effect on company performance compared to other dimensions of flexibility.
- Operational flexibility affects companies’ performance positively and the relationship is significant, but environmental uncertainty does not affect this relationship. This means that operational flexibility, represented by MF, VF, and PDF, enhances company performance even in the absence of the effect of environmental uncertainty, because operational flexibility with the considered dimensions is related directly to the production process, which occurs within the organization and so there is no effect of the external business environment. Moreover, strategic flexibility creates an umbrella for operational flexibility and a defensive wall against environmental uncertainty. In other words, when a company has resource flexibility and coordination flexibility, it automatically follows that its operational activities will be going smoothly without problems.
- Mix flexibility as a dimension of does not have a considerable impact on company performance, perhaps because volume and new product flexibility are more important to meet market needs, and so far the small and medium-sized pharmaceutical companies

in Iran have not been able to expand their production mixture because of sanctions and restrictions on outsourcing for raw materials.

Novel research topics and ideas for future research have been revealed in this current study, by using different perspectives of strategic flexibility and different dimensions of operational flexibility, and also considering technological uncertainty as a source of uncertainty. Also, combination flexibility and other marketing techniques, such as market orientation have been considered in the interests of achieving a flexible orientation for companies, and using flexible orientation as an approach to enhance company performance, because both flexibility and market orientation are the new dynamic capabilities of modern companies.

The study provided an analysis of the topic in the context of small and medium-sized pharmaceutical companies in Iran. The results showed that flexibility as a strategic and operational mechanism is an active strategy, and that it reflects positively on the performance of the target companies. Some of the detailed results match those of international studies, while some do not, which is logical because of the differences in the business environment of each country. In general, the Iranian pharmaceutical sector is a very attractive area for further management and business studies.

SUMMARY

This research can be classified as a causal study because it tried to search for a link between flexibility and company performance, and use uncertainty as a moderating variable on this relationship. Moreover, it assumed a causal relationship between flexibility and performance theoretically, and then tested the relationship empirically. The thesis is composed of six chapters.

Chapter 1 clarifies the research objectives and questions, and highlights the details related to theories that lead to the research hypotheses.

Chapter 2 provides a consecutive and coherent theoretical background on flexibility in management literature in general by providing a review of previous research related to strategic flexibility and operational flexibility, performance, and environmental uncertainty, and the relationships with these variables in a conceptual framework.

Chapter 3 describes the research methodology and the techniques used to achieve the research goals, and demonstrates the data collection method and the analytical techniques and statistical tools used to analyse the data. The primary data for this study were collected by using a questionnaire tool, with a sample consisting of 228 managers from 113 small and medium-sized companies in Iran. These companies are operating in the pharmaceutical sector.

Chapter 4 presented the results of the quantitative study, using figures summarized in tables. A group of statistical analytical tools was applied, including descriptive analysis, reliability analysis, correlation analysis, regression analysis, and moderation analysis.

According to the descriptive analysis results, all the variables were rated as good, in other words the companies are implementing strategic flexibility and operational flexibility as mechanisms to enhance their performance. Company performance was rated as good, and environmental uncertainty is also present.

Regression analysis was used to test the link between SF, OF and company performance. The results showed that both SF and OF positively affect company performance and the relationship is significant; to be more specific, RF, and PDF have the greatest positive impact on company performance, followed by volume flexibility, while coordination flexibility has the least positive and significant effect on company performance, and MF has no impact on company performance.

Moderation analysis was used to test the third and fourth hypotheses. The results clarified that uncertainty as a moderating variable has an effect on the link between SF and company performance, but there is no effect of uncertainty on the link between OF and company performance.

Chapter 5 includes the final conclusion of the study, followed by the recommendations and some possible insights for future research at the end.

Chapter 6 details the main conclusion, and the significant results of the study.

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LIST OF FIGURES

Figure 1-1: Research Model.....	11
Figure 2-1: The Effect of Flexibility Dimensions on Companies' Performance.....	13
Figure 2-2: The Effect of Flexibility Dimensions on Dimensions of Companies' Performance	13
Figure 2-3: The Moderator effect of uncertainty on the relationship between strategic flexibility and companies' performance.....	15

LIST OF TABLES

Table 2-1: The Results of Regression Analysis (Uncertainty as Criterion).....	12
Table 2-2: The Results of Moderated Regression Analysis (Uncertainty as Criterion).....	14
Table 2-3: Moderated Regression Analysis (Uncertainty as Criterion).....	15
Table 3-1: Summary of Quantitative Study Results.....	19



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