

**The Impact of COVID-19 on Firm
Performance: Evidence
From the Turkish Food Manufacturing
Industry**

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**Final International University
August 2023
Girne, TRNC**

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Industry**

By

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A thesis submitted to the Institute of Graduate Studies in partial
fulfillment of the requirements for the Degree of Master
in Business Administration

Final International University
August 2023
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**FINAL INTERNATIONAL UNIVERSITY
INSTITUTE OF GRADUATE STUDIES**

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Turkish Food Manufacturing Industry

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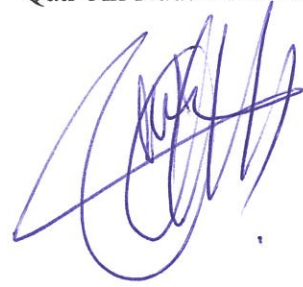
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To my mother and father for their love and support.

ETHICAL DECLARATION

I, Qatr-An-Nada El Harim, hereby, declare that I am the sole author of this thesis and it is my original work. I declare that I have followed ethical standards in collecting and analyzing the data and accurately reported the findings in this thesis. I have also properly credited and cited all the sources included in this work.

Qatr-An-Nada El Harim



ACKNOWLEDGMENTS

To complete this task, I would want to appreciate and express my sincere gratitude to my supervisor, **Asst. Prof. Dr. SENIHA BESIM**. I was able to complete all of the writing phases of my project because of her direction and assistance. Additionally, I want to thank the members of my committee for making my defense a fun experience and for their insightful remarks and ideas.

Additionally, I want to express my gratitude to my entire family for their unwavering support and patience as I conducted my research and wrote my project.

ABSTRACT

The prosperity of an organization is a vital principle, and its economic climate in the 21st century has seen many alterations that have increased difficulty and volatility. Businesses are under considerable competition to perform effectively in this ever-changing context. They have to strengthen their capacity for resilience as well as manage an increasing number of environmental concerns. The ultimate goal of every business currently is constant performance. In the 21st century namely in 2020 and 2021 one of the obstacles faced by all of the businesses around the world is the COVID-19 pandemic. Therefore, the primary goal of this study was to investigate the impact of COVID-19 on the firm performance of listed companies in the Turkish food manufacturing industry which is an important sector for this country. In Turkiye, the scope of the food manufacturing industry was 20% of GDP in 2020.

In this regard, we use the random effects panel estimation model to analyze the impact of the COVID-19 pandemic on the food manufacturing sector as well as to determine the firm-specific variables affecting the firm performance. In this study, we consider all the listed firms in this industry. Based on the availability of information, we analyze 12 listed businesses in the food manufacturing industry for the period from 2013 to 2021. The return on assets, return on equity, and operating return on assets serve as proxies for financial performance. Besides COVID-19, which is the main variable of research, we investigate the impact of free cash flow, growth, firm size, and leverage on the firm performance proxies. Our results show that COVID-19 has a strong positive correlation with all proxies of firm performance leverage strongly and negatively influences return on equity but has no significant effect on the two other performance variables, return on assets, and operating return on assets. Size has a positive impact on all proxies of firm performance. Growth affects return on assets positively. But it has a weak influence on the operating return on assets and does not affect the return on equity. The other variable, free cash flow, is insignificant for all estimations of firm performance.

Keywords: Firm performance, COVID-19 pandemic, Food manufacturing sector.

ÖZ

Bir kuruluşun refahı hayati önem taşır. 21. yüzyıldaki ekonomik iklim, firmalar için bunu zorlaştıran birçok değişikliğe tanık olmuştur. İşletmeler, bu sürekli değişen ortamda etkili bir şekilde performans göstermek için yoğun bir rekabet altındadır. Dayanıklılık kapasitelerini güçlendirmeleri ve çok değişken çevresel etkenleri en iyi şekilde yönetmeleri gerekiyor. Her işletmenin nihai hedefi sürdürülebilir finansal performans, karlılıktır. 21. yüzyılda, 2020 ve 2021 yıllarında, dünyadaki tüm işletmelerin karşılaştığı zorluklardan biri de COVID-19 salgınıdır. Bu nedenle, bu çalışmanın birincil amacı, Türkiye için önemli bir sektör olan Türk gıda imalat sanayinde borsaya kote şirketlerin finansal performansına COVID-19'un etkisini araştırmaktır. Türkiye'de gıda imalat sanayinin kapsamı 2020'de GSYİH'nın %20'si kadardı.

Bu bağlamda, COVID-19 salgınının gıda imalat sektörü üzerindeki etkisini analiz etmek ve firma performansını etkileyen firmaya özgü değişkenleri belirlemek için rastgele etkiler paneli tahmin modelini kullanıyoruz. Bu çalışmada, bu sektördeki tüm borsaya kayıtlı firmaları ele alıyoruz. Veri erişilebilirliğine bağlı olarak, 2013'ten 2021'e kadar olan dönem için gıda imalat endüstrisindeki borsaya kayıtlı 12 işletmeyi analiz ediyoruz. Varlık getirisi, öz sermaye getirisi ve varlıkların faaliyet getirisi, finansal performansı temsil eden değişkenlerdir. Araştırmanın ana değişkeni olan COVID-19'un yanı sıra, serbest nakit akışı, büyüme, firma büyüklüğü ve kaldıraçın firma performans temsilleri üzerindeki etkisini araştırıyoruz. Sonuçlarımız, COVID-19'un firma performansı kaldıraçının tüm temsiliyetleriyle güçlü bir pozitif korelasyona sahip olduğunu göstermektedir. Bulgular, kaldıraçın öz sermaye getirisini güçlü bir şekilde olumsuz etkilemekte olduğunu, ancak diğer iki performans değişkeni olan varlıkların getirisi ve varlıkların faaliyet getirisi üzerinde anlamlı bir etkisinin olmadığını göstermektedir. Büyüklük, firma performansının tüm temsilleri üzerinde olumlu bir etkiye sahiptir. Büyüme, aktif getirisini olumlu etkiler. Ancak aktiflerin faaliyet getirisi üzerinde çok zayıf olumlu bir etkiye sahiptir. Öz sermaye getirisi üzerinde etkisi yoktur. Diğer bir değişken olan serbest nakit akışı, firma performansını etkilemez.

Anahtar kelimeler: Firma performansı, COVID-19 pandemisi, Gıda imalat sanay.

TABLE OF CONTENTS

ETHICAL DECLARATION	vii
ACKNOWLEDGMENTS.....	viii
ABSTRACT	ix
ÖZ.....	x
TABLE OF CONTENTS	xi
CHAPTER 1.....	1
INTRODUCTION	1
1.1 Problem Statement.....	4
1.2 Purpose of the Study	5
1.3 Significance of the Study	5
1.4 Research Questions and Hypotheses	5
1.4.1 Research Questions.....	5
1.4.2 Hypothesis development.....	6
1.5 Limitations	6
CHAPTER 2.....	7
LITERATURE REVIEW	7
2.1 The COVID-19 Pandemic: Impact on the Food Industry	7
2.1.1 Overview of how COVID-19 affects the food industry as a whole.	7
2.1.2 Distinctions among subfields.	8
2.1.3 Impact Variation by Region.....	9
2.2 Companies' financial performance and the factors affecting financial performance during the COVID-19 pandemic	10
2.3 The Role Played by Interventions and Governmental Policies in Lessening the Financial Impact.....	11
2.4 Adaptation and innovation strategy	11

2.4.1	Product line or market diversification	11
2.4.2	The Digital Revolution and the Rise of Electronic Commerce	12
2.5	Security measures implemented to prevent service disruptions.....	12
2.6	Partnerships and teamwork to overcome obstacles	13
2.7	Evidence-based analysis and case study	13
2.7.1	Case studies and empirical results of businesses that survived and thrived throughout the pandemic	13
2.7.2	Case studies and empirical findings of food industry businesses that survived and thrived during the pandemic, in the food production industry.....	14
2.7.3	Empirical studies related to the food industry.....	14
CHAPTER 3.....		16
DATA AND RESEARCH METHODOLOGY.....		16
3.1	Research design	16
3.2	Population and Sampling	16
3.3	Variables and their measurement.....	17
3.4	Econometric model.....	22
3.5	Data Analysis Procedure	23
3.5.1	Panel regression.....	23
3.5.2	The Hausman Test	24
3.5.3	Autocorrelation.....	25
CHAPTER 4.....		27
RESULT AND DISCUSSION		27
4.1	Descriptive statistics	27
4.2	Correlation Analysis	29
4.3	Regression Results and Discussions	30
CHAPTER 5.....		33
CONCLUSIONS AND IMPLICATIONS.....		33

5.1	Conclusions and Discussions	33
5.2	Implications and Recommendations	34
	REFERENCES	36
	APPENDICES	43

LIST OF TABLES

Table 1 : List of companies in the sample	17
Table 2: Explanation of variables variables	21
Table 3: Hausman test results	25
Table 4: Durbin Watson test results	26
Table 5: Descriptive statistics for the period ranging from 2013-2019	28
Table 6: Descriptive statistics for the period ranging from 2013-2021	28
Table 7: Descriptive statistics for the period ranging from 2020-2021	29
Table 8: Correlation matrix for the period 2013-2021	30
Table 9: Panel analysis (covid-19 and return on asset)	30
Table 10: Panel analysis (covid-19 and return on equity)	31
Table 11: Panel analysis (covid-19 and operating return on asset)	31

LIST OF FIGURES

Figure 1: Preliminary framework	17
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LIST OF APPENDICES

Appendix 1: The variables and their measurement.	43
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LIST OF ABBREVIATIONS

EBITDA	Earnings Before Interest Taxes Depreciation, and Amortization.
FCF	Free Cash Flow
FP	Financial Performance
OROA	Operating Return On Assets
ROA	Return On Assets
ROE	Return On Equity
GDP	Gross Domestic Product
COVID-19	Corona Virus Diseas-19
KAP	Turkish Securities Exchange
%	Percentage
\$	Dollar
OLS	Ordinary Least Square
REM	Random Effect Model
RBT	Resource-Based Theory
R&D	Research and Developpement
$\varepsilon_{i,t}$	Error
β	Beta
α	Alpha
μ	Mu
Ln	Natural logarithm

CHAPTER 1

INTRODUCTION

Over time, economic systems have been confronted with risks that have led to crises that have a marked history, and in general terms, risk is a more or less predictable possible danger inherent in a situation or activity. Contemporary economics shows that experience in terms of crises is an asset for managing it well. The world faced a situation never seen in the history of humanity, economy, and finance in particular, it is the COVID-19 pandemic which affected the economic structures starting in March 2020. The world economy was impacted as a whole, regardless of the sectors, transportation, manufacturing, tourism, or restoration, so the economy slowed down for some time. COVID-19 has caused concerns about companies' capacity to repay their debts, and interest rates have been pushed up, so the risk has increased; in particular, there is a crisis of both supply and demand, with rising unemployment and business failures ahead. In the context of this study, the notion of company performance is of primary importance. The study's interest is, therefore, to measure the impact of the COVID-19 pandemic on company performance by focusing on the food industry most strongly affected by the crisis. Because we want to investigate the effect of COVID-19 on the financial performance of companies, we choose a country namely Turkey, in which the food industry is an important sector. As far as default is concerned, we can add that today, the turnover figures collected do not correspond to reality; for a very simple reason, today we perceive default results to be very low, and unfortunately, this can be seen in several countries, for the first reason that the whole economy is slowing down (Hargrave, 2021).

Performance is the ability of an actor or organization to achieve its objectives optimally. Several concepts are linked to the notion of performance; they are grouped in what is known as the performance triangle, which expresses the links between the objectives, means, and results; therefore, we remember that overall performance is the combination of these three capacities: relevance, effectiveness, and efficiency.

- Economic performance measures results, such as the degree of productivity and competitiveness.

- Financial performance uses ratios and quantities such as profitability and economic and financial profitability.
- Societal and environmental performance refers to achievements in ecology, ethics, and citizenship.
- Relational and organizational performance measure a company's ability to reconcile the divergent interests of its stakeholders or its capacity to form partnerships.
- Stock market performance relates to a company's ability to increase its capacity by maintaining a high and progressive stock market price.

This study concentrates on measuring how the COVID-19 pandemic affects the financial performance of listed companies in the food sector. With this analysis, we can show whether this sector is negatively affected by the pandemic.

To measure the financial performance we will use three indicators, ROA (Return on assets), OROA (Operating return on assets), and (Return on equity). These three indicators are, therefore, an excellent indication of the financial performance of the company from the point of view of the holders of capital (i.e., shareholders) and how efficiently the assets are used to generate earnings.

We have probably heard analyses from economists or even members of the government comparing the period experienced with the 1929 crisis. We have not experienced anything comparable since 1929, which is very different from the 1929 crisis, but there is indeed a strong impact on many sectors. The pandemic, which is at the root of this, is accentuated today by phenomena that are part of the world in which we live, namely, an economy that is increasingly global, but also constant population movements.

Therefore, we are discovering this crisis a little more each day, and we are discovering the consequences every day, particularly because we have a large part of the world's population confined for an indeterminate, uncertain period, so a large part of the economic agents for whom the actual duration of the confinement and the return to normal reality is far from certain are fixed; thus, at this stage, there is a great deal of uncertainty, and we do not necessarily have all the elements yet on the consequences that this crisis may have on the financial performance of companies.

Moreover, these consequences, which we cannot necessarily qualify and quantify today in their entirety, certainly have immediate effects, with certain sectors, notably tourism, the hotel and restaurant industry, coming to a complete halt, or even almost all sectors experiencing a sharp drop in production, we can say that we are in a period of crisis with triple consequences: on the one hand, the pandemic health crisis linked to COVID-19, which entails, among other things, the containment that has a strong impact at the economic level and therefore these economic impacts can have financial consequences on the performance of companies in all sectors.

Indeed, many authors define the performance of the company and, therefore, we can quote some of them. We can define the performance of the company as how it allocates all its financial and economic means to achieve its objectives. According to Norman and Ramirez (1993), the art of strategy to create value is to accomplish a determined objective at a predefined moment. Lebas and Euske (2007) define performance as an asset that is indispensable in the field of management and control of a company; it can be measured and allows the evaluation of the situation of the company as well as forecasting and making estimates. Bourguignon (1995) presents the performance of a company in the form of three groups, the first being the performance linked to success, the second linked to the result, and then the last is the performance linked to actions. Tchankan (2000) defined performance as knowing how to manage one's resources in the short, medium, and long run to maintain a competitive advantage.

A company's success depends on how well it runs and makes money and its overall financial performance over time. Performance reviews are frequently conducted to assess a company's cash flow, fund utilization, effectiveness, and efficiency. Data can also benefit executives in their decision-making.

A company's effectiveness is the basis for its financial performance, which includes profit maximization, return on assets, and shareholder return (Chakravarthy et al., 1986). Performance can be challenging to define and measure. Corporate performance evaluation measures consider a business's aims and characteristics. Strategists have proposed several financial analytical models. Nobody can agree on the qualities a credible performance metric set should have (Ostroff and Schmidt, 1993). In finance, the concept of performance has its challenges due to the variety of its application (Pahalathan et al., 2011)

The effectiveness of the senior management team is reflected in the company's success, which in turn reflects the function of each employee and the importance of their work. Therefore, performance is a measure of the efficacy of the management of the organization and the efficacy and efficiency with which its employees and other assets are employed. Financial and non-financial performance are the two main categories of a company's success (Obaid et al., 2016)

Economists have estimated a significant decline in economic activity in 2008. The decline in economic activity was -2.9%, and they thought that the costs of supporting the economy after the pandemic and the recovery plans would exceed the cost of the 2008-2009 crisis, known as the subprime crisis, which was greater than the cost of the Second World War in 1939-45. We are talking about very substantial amounts, this is what we call the financial crisis after the economic crisis, We are in a phase of laxity, euphoria, and above all crisis that leads to indelicate measures from a financial point of view, which risks having a financial counter-shock for companies in the next few years, this being the case, what can be done to protect companies and their assets? What measures should be adopted to overcome a crisis in least bad conditions? Another question that arises is what impact this crisis will have on a company's financial performance and cash flow.

1.1 Problem Statement

Since the beginning of China at the end of 2019, the COVID-19 epidemic has caused global financial collapse. Several nations have implemented containment measures that severely restrict mobility and halt the spread of the virus. Companies stopping or slowing down production contributed to a supply shock, whereas a drop in consumer spending contributed to a demand shock in this unprecedented economic crisis.

There are several reasons for the supply shock. First, because a large proportion of workers were confined, companies had supply problems. The raw materials needed for production from foreign or even local suppliers were no longer transported, and this break in the production chains led to a fall in supply. The demand shock occurred because the workers who were completely or partially unemployed saw their resources and diminished; moreover, the confinement prevented households from buying many products or services.

Many companies, even the most resilient, have been forced to make major changes to how they have always done business. As the pandemic presented new difficulties for Turkey's agribusinesses, it is crucial to understand the specific consequences of COVID-19 on their financial performance.

It is vital to remember that market forces affect financial performance differently based on factors such as a company's size, the degree to which its supply chain is integrated, and its positioning. Given the scope of Turkey's industry, 20 % of the GDP in 2020. Its great and continuous success in the food sector has played a vital role in the Turkish economy.

This study offers a global understanding of how the COVID-19 pandemic has affected Turkish food companies' financial performance.

1.2 Purpose of the Study

The aims of this study are as follows:

- To evaluate the impact of the COVID-19 pandemic on the financial performance of listed food-manufacturing firms in Turkey.
- To determine the firm-specific factors that influence the financial performance of firms in the food manufacturing sector in Turkey.

1.3 Significance of the Study

To the best of our knowledge, this study is the first to investigate the impact of the COVID-19 pandemic on the Turkish food manufacturing sector. In addition to advancing knowledge in the field, the results of this study will help to develop more robust plans to manage economic crises, recover from difficulties, and ensure the long-term health of Turkey's food industry. However, it is easier to precisely determine the factors that impact Turkish companies in the food market from a financial perspective.

1.4 Research Questions and Hypotheses

1.4.1 Research Questions

This study investigated the impact of the COVID-19 pandemic. In this regard, the research will attempt to discover responses to the following questions:

- How much has COVID-19 affected the financial performance of firms in the food industry?
- What are firm-specific factors of financial performance in the Turkish food manufacturing sector?

1.4.2 Hypothesis Development

H1: COVID-19 is negatively and significantly associated with the return on asset ratio.

H2: COVID-19 is negatively and significantly associated with the return on equity ratio.

H3: COVID-19 has a negative and significant association with the operating return-on-assets ratio.

H4: Growth is positively and significantly associated with ROA, ROE, and OROA.

H5: Leverage is positively and significantly associated with ROA, ROE, and OROA.

H6: Free cash flow is positively and significantly associated with ROA, ROE, and OROA.

H7: Size is positively and significantly associated with ROA, ROE, and OROA.

H8: Age is positively and significantly associated with ROA, ROE, and OROA.

1.5 Limitations

The lack of data from the Turkish Securities Exchange (KAP) and Orbis databases is a negative aspect of this study.

Only 12 of the 41 food listed companies were included in this study, reducing the generalizability of the results. Due to the study's narrow focus on only 12 firms, we cannot extrapolate the results to all publicly traded corporations.

CHAPTER 2

LITERATURE REVIEW

2.1 The COVID-19 Pandemic: Impact on the Food Industry

2.1.1 Overview of How COVID-19 Affects the Food Industry as a Whole

This section provides a literature review of the influence of the COVID-19 pandemic on the food industry.

Hobbs (2020) provides an overview of the difficulties encountered by the food industry as a whole as a result of the COVID-19 pandemic, including disruptions to the supply chain and economic uncertainty, and found that customers will prioritize "local" food supply chains in the wake of the COVID-19 epidemic, as well as the rise of the online grocery delivery business.

Other authors, such as Christian et al. (2020), investigated the effects of the COVID-19 pandemic on the global food industry by focusing on the financial performance of businesses and the changes in consumer behavior that resulted from the outbreak and analyzed how the COVID-19 pandemic demand shock affected global agricultural markets. Research shows that a substantial economic slump lowers global meat prices by 7–18% in 2020 and dairy goods by 4–7%. The epidemic has increased food insecurity in many underdeveloped countries despite revenue losses and supply chain disruptions.

Nicola et al. (2020) highlighted the social and economic effects of the COVID-19 pandemic on the food industry, including supply and demand disruptions and issues with food security.

According to Reardon et al. (2020), the COVID-19 pandemic presents unique difficulties for food supply chains in developing nations, compounding inequalities and strains in the food industry. COVID-19 has the greatest direct impact on food access, even though it also affects availability, consumer demand for cheaper, less nutritious foods, and food price instability. The threat of COVID-19 to food security requires political intervention (Laborde et al., 2020).

The industrial sectors have been affected to varying degrees depending on their scale and product category (Hailu, 2020). This study examines the potential impact of the

COVID-19 pandemic on food processing businesses in Canada. First, the COVID-19 pandemic may have repercussions on the economic activities of the food industry, particularly due to disruptions in demand and supply. Second, the effect of the COVID-19 pandemic on the transformation of food products could potentially vary depending on the nature of the goods involved and the size of the processing companies.

2.1.2 Distinctions Among Subfields.

The influence of COVID-19 on firms' financial results and its connection to variances among industry subsectors have been the subject of discussion by several authors.

Galanakis (2020) examines how the COVID-19 pandemic has affected several sectors of the food marketplace, drawing attention to the unique difficulties faced by food processing, distribution, and service, and stresses the significance of food chain sustainability in preventing or reducing the frequency of future food and health crises. The consequences of COVID-19 on the tourism industry have significant financial losses and require necessary modifications to ensure the survival of businesses. In December 2019, the COVID-19 epidemic emerged in China and swiftly extended to Europe, the US, and the world. US hotels lost \$46 billion and 4.8 million in hospitality and leisure employment, respectively, since February 2020. The US AHLA predicted a level of occupancy greater than 20% in the latter months of 2020.

The consequences of COVID-19 on the durability of supply chains in other industries, including food manufacturing and distribution, as well as its impact on business profitability, have been covered in other research, such as that carried out by Ivanov and Das (2020). Chenarides et al. studied consumer behavior changes during the COVID-19 pandemic and how they affected various parts of the food industry, including the transition. (2020). They found that consumer habits have changed, and some have reported buying more products than usual, while others have reported heavily relying on food delivery and pickup services in the early stages of the pandemic, despite the lack of clear industry guidelines.

2.1.3 Impact Variation by Region

Recent studies reveal that geographical differences are linked to COVID-19's effect on financial success. Arndt et al. (2020) explore the effects of COVID-19 containment strategies on income inequality and the availability of food in South Africa, drawing attention to the implications for local food producers. Bonaccorsi et al. (2020) investigate the economic and social effects of COVID-19's limits on human mobility, drawing attention to how these effects vary across different regions, first, municipalities with higher budgetary capacity have higher mobilization rates. Second, segregation is observed because mobility decreases more in municipalities with more inequality and lower per-capita incomes. The results show the social costs of freedom deprivation and an insurmountable challenge: The crisis has reduced government revenues significantly. In addition, a significant financial effort is required to assist the most insecure and reduce poverty and inequality caused by confinement measures.

Glauber et al. (2020), discuss the effects of commercial restrictions put in place as a result of COVID-19 and their impact on food security, highlighting regional differences in the monetary performance of companies in the food industry. They discovered that as a result of the pandemic, supply chains were disrupted, which in turn affected agricultural production; hence, it is prudent to take effective measures to prevent the breakdown of stocks, especially of legumes and fruits.

Naja and Hamadeh (2020) offer several-levels action guidelines to address nourishment issues during the COVID-19 pandemic, drawing attention to the fact that the epidemic's challenges and effects would vary depending on location, they found that nations that depend greatly on food imports to satisfy demand may face a risk of chain failure, particularly if borders close. Each nation's protectionist measures should be combined with global cooperation, solidarity, and coordination to reduce pandemic-related human losses.

Devereux et al. (2020) conceptualize the effects of COVID-19 on household food security, drawing attention to regional variations in the financial performance's influence of food companies. They find it important to take into account the four pillars: availability, access, stability, and utilization, as this provides a holistic framework for food security.

2.2 Companies' Financial Performance and the Factors Affecting Financial Performance During the COVID-19 Pandemic

This section analyses the critical factors that influenced companies' financial performance during the pandemic throughout the world.

The COVID-19 pandemic highlighted the significance of financial performance indicators in gauging a company's resilience. Financial performance metrics including revenue, profitability, and liquidity may be used to assess how badly businesses have been hit by the recession (Bartik et al., 2020); these Recent studies pointed out the relevance of revenue, profitability, and liquidity in assessing business success during the COVID-19 pandemic.

According to Gourinchas et al. (2021), the ability to generate profits and respond to financial obligations on a short-term basis is a crucial indicator of financial performance during the pandemic. To assess the effect of the pandemic on businesses, it is necessary to differentiate between short-term and long-term financial performance. Ivanov (2020), argues that "companies that have successfully adapted to market changes and implemented support measures for their employees are better positioned to survive the crisis over the long term". According to Ivanov (2020), businesses might experience ongoing structural challenges and changes, thus it's vital to look at how the pandemic has affected their financial performance over the short and long term. Overall, a company's ability to resist economic storms and adjust to changing market conditions may be gauged by looking at its financial success in the wake of the COVID-19 pandemic (Bartik et al., 2020; Gupta et al., 2021).

According to Ivanov (2020), companies' financial results suffered greatly due to disruptions in their supply chains brought on by the pandemic. As noted by Choi (2020) many businesses have experienced higher costs and delays in production due to factors such as plant closures, transportation limitations, and shifts in consumer demand. Some studies argue that the pandemic led to alterations in consumer preferences and demand. The view of Gössling et al. (2020), the COVID-19 pandemic has led to substantial shifts in consumer behavior and demand, which has hurt businesses' income, the study examines the potential societal, economic, and tourism-related influences of the COVID-19 pandemic by drawing parallels to prior epidemics/pandemics and other forms of global crises.

According to Nicola et al. (2020), people's panicked purchases and stockpiling of food have put pressure on the food industry, which includes food distribution and retailing, panic buying and hoarding of food supplies have also increased demand in the food manufacturing industry.

According to Baker et al. (2020) household spending and consumption patterns have shifted significantly due to the COVID-19 pandemic, which has had an impact on businesses' net income.

According to Kramer et al. (2020), the pandemic has also increased demand for online products and services, shifting consumer expectations and compelling businesses to revise their commercial models.

2.3 The Role Played by Interventions and Governmental Policies in Lessening the Financial Impact

According to Bartik et al. (2020), government actions and policies including financial support programs and re-engagement efforts mitigated the financial effect of the pandemic on businesses. According to Gupta et al. (2021), many companies and workers were able to overcome the financial obstacles caused by the COVID-19 crisis pandemic because of government policies including subsidies, loans, and unemployment assistance programs. According to Muhtar et al. (2020), governments' social isolation and quarantine policies implemented to slow the spread of the virus have also affected business finances negatively, especially for small and medium-sized companies.

2.4 Adaptation and Innovation Strategy

2.4.1 Product Line or Market Diversification

Some studies investigate how companies try to mitigate the effects of the drop in demand in certain industries. As pointed out by Gourinchas et al. (2020), the pandemic has prompted many businesses to diversify into new markets and customer groups, According to Hailu et al. (2020), food service businesses had to adjust their offerings to meet the changing needs of customers throughout the pandemic, making product line diversification a top priority.

When it comes to recurrent pandemics, some organizations have changed, adjusted, and developed while others have been unable to keep up with the rapid change (Gourinchas et al., 2020).

The Resource-Based Theory (RBT) suggests that product scope variety and regional diversity decisions are linked, particularly for firm performance, although empirical research has mostly ignored these links (Wiersema & Bowen, 2009; Schommer et al., 2019; Ugwuanyi & Ugwu, 2012). Le (2019) and Lee et al (2008), argue that companies' efforts to maintain financial performance during the COVID-19 pandemic were greatly aided by their diversity across product lines and markets. They found that expanding into unrelated markets reduces benefits while increasing costs, creating a negative connection.

2.4.2 The Digital Revolution and the Rise of Electronic Commerce

Ivanov et al. (2020) show that businesses' ability to maintain financial performance during the COVID-19 pandemic was critically dependent on their speedy adoption of electronic commerce and digital transformation.

According to Akpan et al. (2020), digital transformation and the implementation of electronic commerce were crucial in allowing businesses to maintain financial performance during the COVID-19 pandemic. Ivanov (2020) notes that the COVID-19 pandemic has hastened the digitization of supply chains, which is helping businesses overcome logistical hurdles while keeping their financial performance stable.

2.5 Security Measures Implemented to Prevent Service Disruptions

Bartik et al. (2020) stress the need of implementing security measures to guarantee business continuity and financial performance during the COVID-19 pandemic. Kramer et al. (2020) show that companies that embraced remote work and implemented strong security measures had little disruption to operations and sustained financial success throughout the pandemic.

Meyer et al. (2021) argue that the implementation of safety measures like telecommuting and stringent hygiene protocols was essential for businesses to maintain operations and success during the pandemic.

According to research published by Rajeev et al. (2021), companies that implemented stringent health and safety protocols for their employees during the pandemic fared better financially.

2.6 Partnerships and Teamwork to Overcome Obstacles

Several authors have stressed the value of working together to overcome obstacles. As noted by Van Lancker and Parolin (2020) Partnerships between businesses and governments have been crucial in overcoming the challenges posed by the pandemic and supporting the financial success of businesses supporting food security. Craven et al. (2020) posit that partnerships and collaborations played a significant role in assisting businesses in overcoming the challenges posed by the COVID-19 pandemic and maintaining financial success.

According to Gössling et al. (2020), tourism industry businesses were able to build financial resilience by forming partnerships and collaborations that allowed them to create innovative strategies to overcome the challenges posed by the pandemic.

2.7 Evidence-Based Analysis and Case Study

This section will discuss how COVID-19 affects businesses' bottom lines, using real-world examples and case studies to conclude.

2.7.1 Case Studies and Empirical Results of Businesses that Survived and Thrived Throughout the Pandemic

During the COVID-19 pandemic, Nicola et al. (2020) analyze how certain IT companies were able to grow and remain financially stable via quick innovation and responsiveness to shifting market circumstances they found that countries that prioritized technological solutions and the automation of service delivery moved closer to their goals, as shown with China's rapid technological adoption as an example. (Richards & Rickard, 2020) analyse the methods used by food distribution companies and find that, by making operational adjustments and diversifying their channels of distribution, were able to maintain their financial performance during the pandemic.

Nicola et al. (2021) examine many pharmaceutical companies that overcame the financial and operational challenges posed by the COVID-19 pandemic by forming partnerships, collaborating, and investing in R&D.

2.7.2 Case Studies and Empirical Findings of Food Industry Businesses that Survived and Thrived During the Pandemic, in the Food Production Industry

Hobbs (2020) also investigates how certain food industry businesses were able to maintain financial performance during the COVID-19 pandemic. They managed this by swiftly adjusting their supply chains and implementing safety measures to protect workers.

As investigated by Yiwu et al. (2020) some food distribution companies were able to show growth and financial resilience despite the pandemic by rapidly adopting e-commerce and establishing home delivery services.

Mamun et al. (2021) provide case studies of food industry businesses and find that these firms manage to maintain financial performance during the pandemic by diversifying their product lines and using more efficient management strategies.

2.7.3 Empirical Studies Related to the Food Industry

The financial difficulties that certain restaurants have experienced as a result of the COVID-19 pandemic's disruptions to their supply chains have been examined by Zeina et al. (2020).

As found by Götz et al. (2021), some companies in the European food industry face financial difficulties due to falling demand and rising production costs associated with increased safety measures. Though it is anticipated that the shortage of food would worsen during intermediate and extended periods, particularly in economically developing economies, some nations continue to have a sufficient supply of food for an extended period (Deaton & Deaton, 2020).

Another study shows that due to their vulnerability to supply chain disruptions and limited flexibility to respond quickly to market shifts, small and medium-sized food businesses were hit particularly hard by the COVID-19 pandemic (Garca-Martnez et al., 2021).

(Hailu & Barichello, 2020) analyze the financial results of food-related businesses across countries during the COVID-19 pandemic. Their research shows that several factors, including firm size, product diversity, and government policy, have affected financial success.

Nurcan et al. (2021) investigate financial performance gaps between Turkey's food industry's various subsectors while COVID-19 was in the environment. According to the data, the processing food companies and wholesalers fared better than their restaurant and catering counterparts.

Liu et al. (2020) analyze the financial results of Chinese food companies during the COVID-19 pandemic and find significant variances among sub-sectors, especially in terms of profitability and liquidity.

CHAPTER 3

DATA AND RESEARCH METHODOLOGY

In this chapter, we will discuss the research approach that was taken to comprehend how COVID-19 has affected business performance and other determinants of firm performance in the Turkish food manufacturing industry. Our study is based on quantitative methods that utilize statistical techniques to analyze financial data. The first research design is introduced. It is followed by information about population and sampling, and variables and their measurement. In the last two sections econometric model and data analysis procedure are explained.

3.1 Research Design

This study is based on secondary data collected from listed Turkish companies in the food manufacturing sector.

This research aims to make a comparative assessment of the performance of these companies before and after the introduction of COVID-19, to identify how this pandemic affects the financial performance of food manufacturing companies within the framework of this research, we collected data on all food manufacturing companies listed in Borsa İstanbul. After eliminating the companies with insufficient data, we analyze 12 businesses involved in the food sector listed on the Turkish exchange for securities, over a period extending from 2013 to 2021. The cross-sectional data and time series allow us to create panel data. Through this study, we analyze the impact of COVID-19 on the financial performance of the firms, as well as determine the firm-specific variables significantly affecting the financial performance of the firms in our dataset.

3.2 Population and Sampling

Our population includes firms in the food sector listed on the Borsa Istanbul Stock Exchange. For the sample, we started with all the public companies listed in this sector, with 29 companies; we then excluded companies with incomplete data and ended up with 12 companies.

The data for this research were collected from the annual financial statements of the selected companies available in the Orbis database over a period of 10 years

from 2012 to 2021. Our data start in 2012 because, in the Orbis database, the oldest available year starts in 2012 and ends in 2021, as most of the company's financial statements for 2022 are missing. For the calculation of two variables, namely, the proxy for growth and free cash flow, we missed one-year data, and our estimation results cover the 2013-2021 period. These data from nine years and twelve companies allow us to analyze various firm-specific variables that affect the financial performance of firms in the alimentary fabrication sector and compare their financial performance before and after the pandemic of COVID-19.

Figure 1:

Preliminary framework

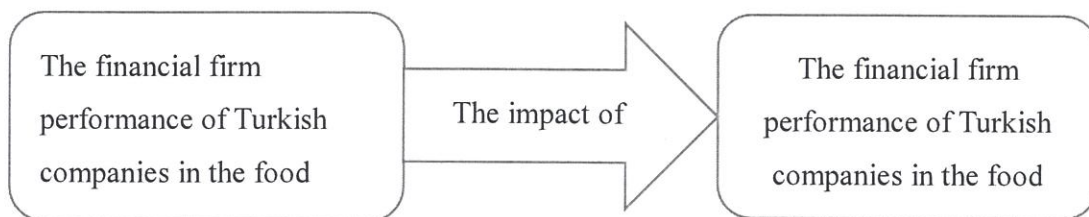


Table 1

List of companies in the sample

COMPANY	Industry
ULUSOY UN SANAYI VE TICARET ANONIM SIRKETI	Food and Tabaco manufacturing
KENT GIDA MADDELERI SANAYII VE TICARET A.S.	Food and Tabaco manufacturing
PINAR SUT MAMULLERI SANAYII A.S.	Food and Tabaco manufacturing
TAT GIDA SANAYI A.S.	Food and Tabaco manufacturing
PINAR ENTEGRE ET VE UN SANAYII A.S.	Food and Tabaco manufacturing
TUKAS GIDA SANAYI VE TICARET A.S.	Food and Tabaco manufacturing
BAK AMBALAJ SANAYI VE TICARET A.S.	Food and Tabaco manufacturing
OYLUM SINAI YATIRIMLAR A.S.	Food and Tabaco manufacturing
MERKO GIDA SANAYI VE TICARET A.S.	Food and Tabaco manufacturing
EKIZ KIMYA SANAYI VE TICARET A.S.	Food and Tabaco manufacturing
ETILER GIDA VE TICARI YATIRIMLAR SANAYI VE TICARET A.S.	Food and Tabaco manufacturing
ALTINYAG MADENCILIK VE ENERJI YATIRIMLARI SANAYI VE TICARET A.S	Food and Tabaco manufacturing

3.3 Variables and Their Measurement

As mentioned above, to begin our research, we used secondary data extracted from the Orbis database for companies active in the food manufacturing industry in

Turkiye. These data allow us to evaluate the relationship between the dependent variables, return on assets (ROA), return on equity (ROE), and operating return on assets (OROA), and the independent variables, such as growth (GROWTH), leverage (LEVERAGE), liquidity (FCF), size (SIZE), and COVID-19, to measure financial performance, the main independent variable of our research, which is the COVID 19 pandemic.

We employ profitability ratios such as return on assets (ROA), return on equity (ROE), and operating return on assets (OROA) to evaluate a company's performance because these metrics are frequently used by potential investors (Rachmania, 2016).

Firm-specific variables such as financial growth, leverage, free cash flow, and size, namely, the independent and dependent variables used as proxies of financial performance, are presented here within an analytical structure:

3.3.1 The Impact of Leverage on Firm Performance

We used sales growth as a proxy for firm growth. The formula for calculating this variable is as follows:

$$\text{Growth} = \frac{\text{sales}_{(t)} - \text{sales}_{(t-1)}}{\text{sales}_{(t-1)}}$$

Sales growth implies an increase from one year to another. Businesses that strive to boost sales will generate future profits. We expect a positive relationship between growth and firm performance. (e.g. Elliot (1972) ranked 88 corporations using criteria like liquidity, growth, owner earnings, management profit performance, leverage, and capital investment, He concluded that the growth factors did not have any appreciable effect on the bottom line.

According to earlier studies (Powell and Eddleston, 2017; Rostamkalaci & Afareel, 2016). Increased business investment activities improve the performance of the company. From the findings of earlier studies, we can infer that growth is crucial for enhancing company performance. Fairfield et al., (2003) divided growth in net operating assets into accruals and long-term operating assets, they discovered that the one-year-ahead return on assets was adversely correlated with both aspects of net operating asset growth. The market's apparent underestimation of accrued expenses is related to investors' failure to accurately estimate the consequences of the increase in net operating assets for future performance, regardless of whether the growth is in current or long-term net operating assets.

3.3.2 Impact of Leverage on Firm Performance

In line with Rajan et al., (2014) who defined leverage as the ratio of liabilities to assets, we use the total debt to total assets ratio as a proxy for leverage

$$\text{Leverage} = \text{Total debt} / \text{Total asset}$$

The literature shows contradictory results for the debt-firm performance relationship. Some researchers have found a negative relationship (e.g., Chen & Wang, 2004; Tian & Zeitun, 2014), whereas others find a positive relationship or no significant impact of leverage on performance (e.g., Azeez, 2015; Gill et al., 2011). Tradeoff theory states that there is an optimum level of debt for each firm, which creates a tax advantage for firms. Firms should be profitable enough to avoid bankruptcy and benefit from the tax advantage of debt. Based on this theory, a positive relationship exists between debt and profitability (Modigliani & Miller, 1963). However, pecking order theory posits a negative relationship between leverage and profitability (Myers & Majluf, 1984). According to this theory, more profitable firms have lower debt ratios than less profitable firms. Profitable firms prefer to use internal funds to avoid the costs of external funds. In this study, we expect debt to negatively impact profitability.

3.3.3 The impact of Free Cash Flow on Firm Performance

Free cash flow has a positive impact on a company's financial performance, as shown by the research of Ojode (2014). Increasing a company's free cash flow leads to more profits, which in turn increases the company's financial performance.

Firms can increase their free cash flow by increasing bill payment time, decreasing customer payment time, and minimizing inventory purchasing.

According to Ojode (2014) FCF has a positive effect on a company's financial performance, improving its profit and overall financial performance.

Research on the relationship between free cash flow and financial performance has produced contrasting results. For instance, Ogbeide and Akanji (2017) suggest that cash flow has a significant impact on the financial performance of Nigerian firms.

Lai et al., (2017) discovered in Malaysia that FCF has a detrimental impact on ROE in Kenya. Mutende et al. (2017) find that FCF and firm performance are significantly correlated.

However, Ojode (2014) found that free cash flow has a more significant impact on business profitability. The free cash flow is calculated as

$$\text{Free Cash Flow} = \text{EBITDA} + \text{Depreciation} - \text{Change in net working capital} - \text{Change in fixed assets}$$

3.3.4 The Impact of Size on Firm Performance

Previous research shows that the larger a company, the better it performs financially.

Lee J. et al., (2009) investigate the impact of company size on profitability. The findings show that the overall size of the company plays a significant role in explaining productivity.

Falope et al., (2009) analyze the effect of working capital on the performance of a sample of 50 publicly traded companies, but find no statistically significant link between the two variables).

while other groups of researchers find that board size is influenced by firm-specific factors like Tobin's Q, profitability, and business size, according to (Lehn et al., 2004; Boone et al., 2007; Coles et al., 2008; Guest 2008; Linck et al., 2008). Previous studies have failed to appropriately adjust for endogeneity issues because they negatively affect board size (Wintoki, 2007).

There are several ways in which a company's size affects its financial performance. Large companies are more productive than small ones, because they may take advantage of economies of scale and scope (Ahmed et al. 2010). The size was calculated as follows:

$$\text{Size} = \text{Natural Logarithm of Total asset}$$

3.3.5 Return on Assets (ROA)

Return on Assets is a ratio that indicates the return on a company's total assets. Profitability can be measured by examining the return on assets.

The analysis of Return on Assets (ROA) can compare a firm's efficiency of capital use with that of other similar companies if the company has access to industry data that allows for the calculation of industry ratios. This allows the company to determine whether its capital use efficiency is below, at, or above the industry

average. The higher the ROA, the more profit the company makes and the stronger its asset utilization (Brigham & Houston, 2016). The formula for the calculation of this variable is as follows:

$$\text{Return on asset} = \text{Net income} / \text{Total asset}$$

3.3.6 Return on Equity (ROE)

Kasmir (2015) states that the ratio of net income after taxes to own capital is the return on equity ratio. This ratio reflects the use of capital. This ratio should be as high as possible. Consequently, the owner's status in the company is improving.

Own capital profitability is a substitute for return on equity (ROE), which measures a company's (issuer's) capacity to profit using the company's capital. The ratio of a company's earnings to its equity investment is known as return on equity (Duniarto, 2015). Return on equity (ROE) is widely used as an indicator of a company's success. Companies with higher ROE levels are considered more successful. The formula for the calculation of this variable is as follows:

$$\text{Return on Equity} = \text{Net income} / \text{Total equity.}$$

3.3.7 Return on operating income (OROA)

Similar to the traditional return on assets ratio, operating return on assets (OROA) employs operating income rather than net income as the numerator. By displaying the amount of income produced per dollar invested in its operating assets, the OROA is used to assess a company's operational efficiency. The formula for the calculation of this variable is as follows:

$$\text{Operating Return on Assets} = \text{Operating income} / \text{Total asset}$$

Table 2

Explanation of variables variables

Variable	proxy
Return on Asset (ROA)	Net income / Total asset
Return on Equity (ROE)	Net income / Total equity
Operating Return on Assets (OROA)	Operating income / Total asset
Growth	Sales(t)-sales(t-1)/sales(t-1)
Leverage	Total debt / Total asset

Table 2*Continued*

Free Cash Flow	EBITDA+ depreciation -((CurentAsset-Curent Liabilities)(t) – Curent Asset-Curent Liabilities(t-1))-(Fixed Asset(t)-Fixed Asset(t-1))
Size	Natural Logarithm of Total Asset

We employ a dummy variable to describe the effect of COVID-19 on financial firm performance; it takes the value “0” in the years 2013-2019 and the value “1” during the year 2020-2021.

3.4 Econometric Model

After defining our dependent variables (ROA, ROE, and OROA) and independent variables (growth, leverage, FCF, size, and COVID-19), we statistically analyzed the data.

Furthermore, to allow for reliable analysis, we resorted to the analysis of panel data using a statistical method appropriate for our research. This method allows us to analyze the impact of the time variable before, during, and after COVID-19 on the financial performance of different companies in the food sector in Turkey.

The panel data were analyzed using a linear regression model. With this model, it is easy to observe both inter-firm and intra-firm variations.

$$\text{Financial Performance}_{it} = \alpha + \beta_1 \text{GROWTH}_{it} + \beta_2 \text{LEVERAGE}_{it} + \beta_3 \text{FCF}_{it} + \beta_4 \text{SIZE}_{it} + \mu_0 \text{COVID 19} + \varepsilon_{i,t}$$

where

- *i* represents the company ($i = 1, 2, \dots, N$)
- *t* represents the time dimension ($t = 2013 \dots 2021$)
- α_i represents the specific fixed effect of the company
- ε_{it} represents the error

After taking into account the various proxies, the following regression models are used to test the null hypothesis:

$$\text{ROA}_{i,t} = \alpha + \beta_1 \text{GROWTH}_{it} + \beta_2 \text{LEVERAGE}_{it} + \beta_3 \text{FCF}_{it} + \beta_4 \text{SIZE}_{it} + \mu_0 \text{COVID 19} + \varepsilon_{i,t}$$

$$\text{ROE}_{i,t} = \alpha + \beta_1 \text{GROWTH}_{it} + \beta_2 \text{LEVERAGE}_{it} + \beta_3 \text{FCF}_{it} + \beta_4 \text{SIZE}_{it} + \mu_0 \text{COVID 19} + \varepsilon_{i,t}$$

$$ORO A_{i,t} = \alpha + \beta_1 GROWTH_{i,t} + \beta_2 LEVERAGE_{i,t} + \beta_3 FCF_{i,t} + \beta_4 SIZE_{i,t} + \mu_0 COVID_{19_{i,t}} + \varepsilon_{i,t}$$

3.5 Data Analysis Procedure

3.5.1 Panel Regression

Cross-sectional data for a group of individuals were collected in the form of a panel dataset when statistical observations were made at regular intervals over a specified period (Baltagi, 2008).

Most analyses are based on statistical models that use pooled ordinary least square regression, the fixed effects model, and the random effects model.

3.5.1.1 Pooled Ordinary Least Square

One of the most commonly used methods for analyzing panel data is the pooled ordinary least squares (OLS) method.

The major problem with this technique is that individual or temporal effects are ignored; however, this method may lead to biased results if unobserved effects exist. (Baltagi, 2008)

3.5.1.2 Fixed-Effect Model

The Fixed Effects model considers individual heterogeneity by permitting differences in the intercept. When there is an association between explanatory variables and individual effects that cannot be directly observed, the model is robust (Wooldridge, 2010).

The fixed-effects model makes it possible to control for individual heterogeneity by allowing the intercept to fluctuate from one individual to another. This technique is useful when unobserved individual effects are linked to the explanatory variables. To simplify the analysis, let us assume that there is a single underlying effect size, and that any observed disparities between studies are simply the result of random chance.

3.5.1.3 Random Effects Model

The random-effects model implies uncorrelated explanatory factors and individual-specific effects. This approach enables generalization beyond the study sample (Hsiao, 2003).

- Heterogeneity makes a fixed effect size implausible, meaning that differences among studies are not due to chance. As expected, there is variation among studies because they are conducted at different times, on different populations, and sometimes even in different countries.
- It takes into account two variables, namely, the fact that there is both within-study variance and between-study variance or heterogeneity, similar to the fixed model, which takes into account the first but not the second.

Summary

	Assumption	heterogeneity	Confidence interval
Fixed effect model	<ul style="list-style-type: none"> • All the investigations show the same actual effect, and the variations are attributable to random chance. 	ignored	Narrower
Random effect model	<ul style="list-style-type: none"> • The study effect comes from a statistical distribution 	incorporated	wider

3.5.2 The Hausman Test

To choose the most accurate and consistent estimator, The Hausman test can distinguish between models with fixed effects and those with random effects (Baltagi, 2008)

When deciding between a fixed effect model and a random effect model, the Hausman test (also known as the Durbin-Wu-Hausman test) can demonstrate which model yields more trustworthy results by providing parameter estimates that are not only unbiased, but also particularly efficient and consistent.

Statement of hypothesis

H₀: Random effect model is the appropriate estimator

Or

$H_0: Cov (W_i, X_{it}) = 0$ (i.e REM is correct estimator)

Or

$H_0: FEM$ and REM estimators do not differ substantially

And

$H_1: Fixed$ effect model is the appropriate estimator

$H_1: Cov (W_i, X_{it}) \neq 0$ Rejecting H_0 leads us to the conclusion that REM is inappropriate because of the likely correlation between the random effects and X_{it} , (I.e $Cov W_i, X_{it} \neq 0$).

The Hausman test is predicated on the null hypothesis that the random-effect estimator is adequate.

If the null hypothesis is rejected, then the random effects are likely linked to one or more of the regressors, and the fixed effects model should be used for testing.

The null hypothesis states that we should use the random effects model, and if we reject it, then we will use the alternative, which is the fixed effect model.

The value p determines which approach is preferred. If the p -value at the end of the model run is less than 5% (level of significance), the fixed-effects model (FEM) should be retained. If, however, p is not statistically significant, then the random effects model (REM) should be used for adjustment.

Table 3

Hausman test results

Test summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Specification: Model 1 ROA	0	5	1
Specification: Model 2 ROE	0	5	1
Specification: Model 3 OROA	0	5	1

3.5.3 Autocorrelation

The elimination of serial correlation is necessary because, if the data are correlated with their past or future values in the time series, the identification of the significant correlation will be adversely impacted. Autocorrelation is also known as a serial correlation. The Durbin-Watson test is frequently employed to determine whether such an issue exists (Wooldridge, 2012). According to Wooldridge (2012), autocorrelation is present if the test value is close to 0 or 4. In this test, a value of 0

represents a positive result, a value of 4 represents a negative result, and a value of approximately 2 indicates that there is no autocorrelation issue (Wooldridge, 2012).

Table 4

Durbin Watson test results

Durbin-Watson stat	2.603372
Durbin-Watson stat	2.398359
Durbin-Watson stat	2.300295

CHAPTER 4

RESULT AND DISCUSSION

This section presents the results of the data analysis. Statistical tests were used to examine the variables in the suggested model, and correlation and multiple regression analyses were used to identify the associations between the dependent and independent variables.

4.1 Descriptive Statistics

The outcomes of the descriptive data analysis are presented in this section. Independent and dependent variables were provided according to the data collected for 12 firms. The statistical descriptions of the 2013-2019 period preceding the COVID-19 pandemic are provided in Table 5. Table 6 provides descriptive statistics for the entire study period (i.e., from 2013 to 2021) for all companies included in our research, and the descriptive statistics for 2020-2021 during the COVID-19 period are presented in Table 7.

This study investigated the effects of COVID-19 on the financial performance of publicly traded companies in Turkey, specifically in the food manufacturing industry. The standard deviation, mean, and median were used for each period to provide a clearer picture of the overall situation. The mean provides details regarding the average values of the variables in the sample, whereas the standard deviation provides information regarding the dispersion of the values of the variables surrounding the mean. The median represents the middle value of the data for each variable, and descriptive statistics reveal that the variables vary by firm, indicating that the pandemic affected businesses.

According to the descriptive statistics in Table 5 for the years 2013 through 2019, ROA has a mean, or central value, of about -0.0049 and a standard deviation of 0.1818. ROE has a mean score that is more outstanding -0.0987, and for OROA 0.0309. The medians for ROA, ROE, and OROA were 0.0277, 0.0644 and 0.0509 respectively. The maximum and minimum ROA for this period is 0.22 and -1.35 and for ROE the max is 0.67 and the minimum is -2.57. On average, the leverage is 0.5447, while the mean value for growth is -0.018.

Table 6 shows that for the years 2013 through 2021, the ROA results had a mean or central value of approximately 0.0145, the median for ROA was around 0.034 and a standard deviation of 0.169. The maximum and minimum ROA for this period were 0.235 and -1.36. ROE has a mean score that is more outstanding -0.047 and for OROA, the mean is 0.0382. The median for, ROE and OROA are respectively 0.082 and 0.0525. On average, free cash flow is 1.61, while the mean value for growth is 0.031.

Table 7 shows the descriptive analysis for the COVID-19 years 2020-2021. By comparing the progression of the individual values of the variables, we want to more thoroughly investigate the impact of the COVID-19 pandemic on financial business performance. In Table 7, the mean values for ROA, ROE, and OROA are 0.082, -0.35, and 0.063 respectively.

Table 5

Descriptive statistics for the period ranging from 2013-2019

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
ROA	-0.004957	0.027720	0.226310	-1.359872	0.181816	84
ROE	-0.098759	0.064435	0.672229	-2.575846	0.533434	84
OROA	0.030961	0.050926	0.183206	-0.634327	0.101313	84
FCF	1.664275	0.5961711	7.849963	-1.310011	2.171307	84
GROWTH	-0.018418	-0.052431	1.277840	-0.982610	0.322095	84
SIZE_	10.91800	11.47044	12.72518	7.544463	1.463472	84
LEVERAGE	0.544789	0.546126	0.951550	0.155987	0.206445	84

Table 6

Descriptive statistics for the period ranging from 2013-2021

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
ROA	0.014476	0.034006	0.234978	-1.359872	0.168630	108
ROE	-0.046808	0.082101	0.672229	-2.575846	0.491570	108
OROA	0.038210	0.052562	0.183206	-0.634327	0.093799	108
FCF	1.605184	0.6516967	7.031343	-1.364100	2.149092	108
GROWTH	0.030894	-0.054439	5.903065	-0.982610	0.670638	108
SIZE_	10.90092	11.47044	12.72518	7.544463	1.454336	108
LEVERAGE	0.529273	0.525848	0.951550	0.068015	0.209988	108

Table 7*Descriptive statistics for the period ranging from 2020-2021*

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
ROA	0.082489	0.079910	0.234978	-0.147918	0.082414	24
ROE	0.135019	0.168772	0.564801	-0.765811	0.230084	24
OROA	0.063583	0.076226	0.154700	-0.068507	0.055011	24
FCF	1.398365	0.697211	6.001876	-1.364100	2.101342	24
GROWTH	0.203486	-0.119334	5.903065	-0.726823	1.295374	24
SIZE	10.84117	11.51327	12.55829	8.479475	1.451230	24
LEVERAGE	0.474967	0.460509	0.806848	0.068015	0.217669	24

By comparing the means of each variable for the three different periods, we can explain the differences between the pre-COVID-19, COVID-19, and post-COVID-19 periods.

The mean ROA is negative before and after COVID-19, but it turns out to be positive during the COVID period, indicating that COVID-19 positively affected ROA, while The ROE was negative before COVID-19 but turned out to be positive during the COVID-19 period. This means that ROE is positively affected by COVID-19, whereas OROA is positive for the entire period before COVID-19 and increases slightly after COVID-19.

FCF, SIZE, and LEVERAGE showed a small decrease in their means, but were positively affected by COVID-19. The GROWTH test is negative before COVID-19, but it turns out to be positive during and after covid-19 this result shows that COVID-19 positively affected GROWTH.

4.2 Correlation Analysis

This correlation illustrates the interrelationship between the dependent and explanatory factors (independent variables).

In the correlation analysis, we examined how the dependent and independent variables relate to one another. The direction and intensity of the relationship are both shown via a correlation analysis. In addition, it enabled the detection of multicollinearity issues. For the model to be reliable, there should not be any issues with multicollinearity among the variables. When the correlation coefficient between

two or more variables exceeds 0.8, it becomes problematic (Gujarati 2003). The results of the Pearson correlation test show that none of the independent variables used in the model correlate greater than 0.8 with another independent variable. This demonstrates that there were no issues with multicollinearity in the data.

From Table 8, we can see that FCF is positively and significantly related to all three independent variables ROA, ROE, and OROA. GROWTH is also positively, but insignificantly, correlated with ROA, ROE, and OROA. In contrast, SIZE is positively and significantly correlated with the dependent variables ROA, ROE, and OROA. LEVERAGE showed a negative correlation with the dependent variables but was significantly correlated with ROE. COVID-19 is positively, but insignificantly, correlated with ROA, ROE, and OROA.

Table 8

Correlation matrix for the period 2013-2021

	ROA	ROE	OROA	FCF	GROWTH	SIZE	LEVERAGE
ROA	1						
ROE	0.721*	1					
OROA	0.853*	0.584*	1				
FCF	0.194*	0.205*	0.294*	1			
GROWTH	0.168	0.128	0.081	-0.164*	1		
SIZE	0.336*	0.344*	0.491*	0.606*	-0.134	1	
LEVERAGE	-0.182	-0.356*	-0.102	-0.292	-0.156	-0.204*	1

* shows significance at a 5% level.

4.3 Regression Results and Discussions

R square is used to indicate the variation in the dependent variables (ROA, ROE, and OROA)

Table 9

Panel analysis (covid-19 and return on asset)

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
FCF	0.001	0.009	0.03	0.976	-0.018	0.018
GROWTH	0.045	0.023	1.94	0.052	0.000	0.091
SIZE	0.040	0.013	3.13	0.002	0.015	0.066
LEVERAGE	-0.046	0.078	-0.59	0.553	-0.198	0.106
COVID-19	0.077	0.036	2.10	0.036	0.005	0.148
Constant	-0.420	0.142	-2.96	0.003	-0.699	-0.142
Overall r-squared		0.200	Number of obs			108
Chi-square		25.491	Prob > chi2			0.000
R-squared within		0.135	R-squared between			0.628

Table 10*Panel analysis (covid-19 and return on equity)*

Roe	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
FCF	-0.015	0.026	-0.57	0.566	-0.066	0.036
GROWTH	0.074	0.066	1.12	0.262	-0.055	0.203
SIZE	0.116	0.036	3.19	0.001	0.045	0.188
LEVERAGE	-0.636	0.220	-2.90	0.004	-1.067	-0.206
COVID-19	0.176	0.103	1.70	0.089	-0.027	0.378
Constant	-0.997	0.403	-2.47	0.013	-1.786	-0.207
Overall r-squared		0.245	Number of obs			108
Chi-square		33.175	Prob > chi2			0.000
R-squared within		0.199	R-squared between			0.598

Table 11*Panel analysis (covid-19 and operating return on asset)*

OROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
FCF	0.002	0.005	0.36	0.722	-0.008	0.011
GROWTH	0.020	0.012	1.64	0.102	-0.004	0.044
SIZE	0.032	0.007	4.73	0.000	0.019	0.045
LEVERAGE	0.023	0.041	0.57	0.570	-0.057	0.103
COVID-19	0.032	0.019	1.67	0.094	-0.005	0.070
Constant	-0.334	0.075	-4.46	0.000	-0.481	-0.187
Overall R-squared		0.284	Number of obs			108
Chi-square		40.367	Prob > chi2			0.000
R-squared within		0.096	R-squared between			0.828

The coefficient of determination remains moderate, indicating that the factors chosen explain 20 % of the variable ROA, 24 % of the variable ROE, and 28 % of the variable OROA.

R-square is applied to show how much of the variation in the dependent variable (ROA, ROE, and OROA) could be attributed to the independent variable. The R-square values in Tables 9, 10, and 11 are 0.2, 0.24, and 0.28. In contrast to our hypotheses, Tables 9, 10, and 11 show that COVID-19 is significantly positively associated with ROA, ROE, and OROA. Although the financial performance of companies in many other sectors was negatively affected by the pandemic, our results show that the COVID-19 pandemic positively affected the financial performance of the Turkish food manufacturing sector. The pandemic has resulted in changes in people's lifestyles. Due to lockdowns and restrictions, people spend most of their time at home, resulting in a higher consumption of food products. Many

markets started online marketing, which enabled people to reach food products easily, positively affecting the food manufacturing sector.

The estimation results show that Free Cash Flow has a positive influence on ROA ($b=0.001$) with a p-value of 0.976 which is more than 0.05 indicating that FCF has an insignificant effect on financial performance (ROA), as well as a negative influence on ROE ($b=-0.015$) with a p-value of 0.566 which is more than 0.05 (significant level), indicating that FCF is not significant with ROE, the relationship between OROA and FCF is positive ($b=0.002$), but not significant, the p-value (0.722) which is more than 0.05. Overall, the FCF did not significantly affect the performance.

The model's findings suggest that the independent variable GROWTH has a significant impact on the independent variable ROA. However, there was no significant relationship between growth and ROE, with a p-value of 0.262. This positive influence on ROA is represented as ($b=0.045$), and the p-value (0.052) was slightly over 0.05 (significant level One unit increase in growth results in a 4.5 % increase in ROA. Additionally, growth has a favorable impact on OROA ($b=0.02$); however, because the value is ($p=0.106$) greater than 0.05, there is no significant difference between OROA and growth.

The findings show that firm size has a significant impact on the financial performance of the listed Turkish food companies, with a positive impact on all performance variables, ROA, ROE, and OROA, with coefficients of 0.04, 0.116, and 0.023. The p-values (0.002; 0.001; and 0.000) were below the significance level of 0.05.

Leverage has an adverse influence on ROA, according to the results ($b=-0.046$ $p=0.553$). However, while the p-value is above the level required for significance (0.05), the impact of leverage on financial performance is not statistically significant. Leverage has a positive influence on OROA ($b=0.023$), however, there is no significant relationship between leverage and OROA, with a p-value of 0.057. Leverage has a negative effect on ROE ($b=-0.636$) with a p-value of 0.004, indicating that the influence of leverage on firm performance is significant.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

5.1 Conclusions and Discussions

This study uses a quantitative research design to examine how the COVID-19 epidemic has affected food manufacturing firms in Turkiye. It also analyzes the main firm-specific determinants of financial performance in this industry. The analysis covers the period 2012-2013 for the 12 listed food-manufacturing firms in this country. For Turkey, the food manufacturing sector is very important as it constitutes 20 % of the GDP.

The study's findings indicate that the pandemic's "active period" which can be defined as the time when the disease was most acutely felt, the food manufacturing industry in Turkey performed better compared to the pre-COVID period. . Even though firms in many industries throughout the world suffered a significant setback, ceasing their operations entirely or partially during this time, the empirical results of the study show that the COVID-19 pandemic positively impacts all financial performance measures. China's has decreased by 6.8%, while many other nations have experienced serious corporate failures and employment losses (Fu and Shen 2020). According to Moody's 2020 report, the pandemic has affected all industries and sectors worldwide, and has had more severe effects on certain industries, such as transportation, entertainment, and textiles, which is not the case for the Turkish food industry. In the peak years of COVID-19, 2020-2021, due to lockdowns and restrictions, people spend most of their time at home. The consumption of food has also increased. Many markets started online marketing which enabled people to reach food products easily, this new consumption behavior affected the food manufacturing sector positively.

Our analysis indicates that firm-specific factors have varying effects on different proxies for financial performance. According to the empirical results of this study, Growth significantly and positively influences the return on assets (ROA). Besides growth, firm size is another factor affecting return on assets (ROA) positively. Leverage and free cash flow have no impact on this variable. For return on equity (ROE), size and leverage are significant firm-specific variables. As firm

size grows, return on equity (ROE) is positively affected; however, as leverage increases, it is negatively affected. Growth and free cash flow do not affect the return on equity ratio (ROE).

When we consider the last performance variable, operating return on assets (OROA), we find that the most important firm-specific determinant is the firm size. Firm size has a positive effect on assets (OROA). Growth has a weak positive impact on OROA.

The purpose of this study is to identify the key factors that affect a company's performance and to look into any potential effects that COVID-19 may have had on the performance of Turkish food manufacturing firms

5.2 Implications and Recommendations

Crises and pandemics such as the COVID-19 pandemic that swept the world rapidly. It has significantly impacted the financial firm performance and, by extension, employee behaviour and performance.

The pandemic has changed how people work. Organizations have faced difficulties in ensuring that their employees can work effectively and remain committed and engaged during the crisis, which has been marked by uncertainty and ambiguity (Gallup, 2020). At the same time, features of Industry 4.0 such as interconnectivity and smart automation have become more prevalent and adopted by organizations worldwide. Therefore, the pandemic has created a challenging context for implementing human resource management policies and practices. In particular, managers and supervisors have had to cope with new issues related to the adjustment of their workforce to the drastic changes in both the organizational and working environment. The field of organizational behaviour has been studied extensively, but the pandemic and the rapid digitalization of organizations have raised new questions and challenges.

While this study has some limitations. One of the major difficulties encountered in performing this study was the lack of data on leverage, growth, and free cash flow ratio in the Turkish Stock Exchange, the Orbis database, and corporate websites for many of the firms. Due to missing information for most of the firms in the Turkish food manufacturing industry, our analysis includes 12 firms for the period of study and the year 2023. Second, due to the absence of complete data for the following

year in the database at the time this study is being conducted, the analysis does not include the post-COVID-19 period. To better understand the impact of the global epidemic on the firm performance, we advise the future study to extend their possible study for more years, to include the period after the pandemic. Third, this study can be extended to other sectors and a comparative study can be conducted.

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APPENDICES

Appendix 1 : The Variables and Their Measurement

Variable	proxy
Return on Asset (ROA)	Net income / Total asset
Return on Equity (ROE)	Net income / Total equity
Operating Return on Assets (OROA)	Operating income / Total asset
Growth	$\text{Sales}(t) - \text{sales}(t-1) / \text{sales}(t-1)$
Leverage	Total debt / Total asset
Free Cash Flow	$\text{EBITDA} - ((\text{Curent Asset} - \text{Curent Liabilities})(t) - \text{Curent Asset} - \text{Curent Liabilities}(t-1)) - (\text{Fixed Asset}(t) - \text{Fixed Asset}(t-1))$
Size	Natural Logarithm of Total Asset