

## The Impact of Operating and financial leverages on the Financial Performance of the Jordanian Industrial Companies

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**Abstract:** The aim of this study was to examine the impact of operating and financial leverages on the financial performance of Jordanian industrial companies, measured by return on assets (ROA) and return on equity (ROE). The study adopted a descriptive analytical approach, with a quantitative methodology utilized to analyze data from 23 Jordanian industrial companies for the period 2017-2021. A Random-effect GLS regression was conducted to obtain results. The findings indicate that both operating and financial leverages have a significant impact on the financial performance of Jordanian industrial companies, as measured by ROA and ROE. These results contradict the four hypotheses that suggest that operating and financial leverages do not significantly impact the financial performance of these companies. The study recommends further research to explore the impact of operating and financial leverages on the financial performance of companies operating in other sectors, such as: the agricultural, banking, and trading

**Keywords:** Operating leverage, financial leverage, financial performance, Jordanian industrial companies, return on assets (ROA), return on equity (ROE)

## 1. Introduction

Finance is a very important sector. That is because funding enterprises affect the employment opportunities available in the market and the growth and profits of enterprises (Al Dabbas, 2022). The fields of finance include: financial planning, financial models analysis, and analysis of financial activities (Sloka, 2020). In the field of finance, the term leverage attracted the attention of many researchers in the field of business and economy. It can be defined as the ratio of debt to assets (Al-Shamaileh and Khanfar, 2014). It can be measured through the book value of the total liabilities divided by the value of total assets. It can be also measured through the ratio of the long-term (or the short-term and the long-term) debt to the total assets (Zhang and Zhou, 2020). It can be also defined as the ratio of an entity's total assets (including the borrowed assets) to its own wealth (Zhu et al., 2014).

Leverage has been playing a significant role in developed and emerging markets. It serves as an effective tool for controlling financial crises. Showing attention to leverage may lead to having less financial crises per century. It can improve the company's ability to compete. It allows companies to allocate their resources in a manner that is more wisely and efficiently (Zhu et al., 2014). It allows investors and firms to invest or operate (Al-Shamaileh and Khanfar, 2014).

Leverage affects several economic variables. For instance, it affects equality in terms of income. It also affects wealth distribution. It should be noted that the higher the leverage is, the more inequality shall be in terms of wealth distribution (Zhu et al., 2014).

There are two types of leverage, which are: (financial and operating leverage) (Winata, 2023). Regarding the financial leverage it can be defined as "the leverage effect on account of the financial cost, interest" (Al-Shamaileh and Khanfar, 2014: 256). It can be defined as the degree to which a firm utilizes borrowed money (Gill and Mathur, 2011). It can be defined as the degree to which a company uses fixed items, like debt and preferred equity (Velez, 2010) (cited in Al-Momani, and Obeidat, 2017). As for the operating leverage, it can be defined as "the leverage effect on account of all fixed costs other than interest" (Al-Shamaileh and Khanfar, 2014: 256). It can be defined as '*the emergence of a fixed cost in a company's operations that is associated with the use of fixed assets. Operating leverage occurs when a company uses fixed assets in its operations*' (Marjohan, 2022).

Regarding financial leverage, it affects profitability. The financial leverage ratio is calculated to get a better understanding for the funding methods used by the company. It may be calculated to get a better understanding for the company's ability to fulfil its financial obligations (Al-Shamaileh and Khanfar, 2014).

Financial leverage reflects several economic variables. For instance, it reflects the debt risk and solvency of economic subjects which is generally measured by the asset-liability ratio. It is affected by several variables. For instance, an increase in the value of private property shall reduce the financial leverage (Ma et al., 2021).

It is suggested that the financial leverage affects the risks faced by stakeholders<sup>1</sup> and the costs incurred by them (Paeleman et al., 2023). Karma & Sander (2006) add that the higher the financial leverage is, the greater the risks faced by shareholders. Akhtar et al. (2012) add that there is a positive relationship between financial leverage and financial performance.

Regarding the operating leverage, Asraf, & Mia Muchia Desda (2020) add that operating leverage doesn't have any impact on profitability. De Medeiros et al. (2016) add that operating leverage has an impact on stock returns in the Brazilian market.

In this regard, it should be noted that few researchers conducted studies about the impact of operating and financial leverages on the financial performance of companies. Hence, the researcher of the present study found it necessary to conduct a study about this topic. Therefore, the problem of this study is represented in the following question:

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<sup>1</sup> Customers and employees

(What are the impacts of operating and financial leverages on the financial performance of the Jordanian industrial companies?) The financial performance in this study is represented in the return on assets (ROA) and return on equity (ROE).

The present study is significant because it sheds a light on two types leverage (operating and financial leverage). It is significant because it measures financial performance through two variables, which are: the return on return on assets (ROA) and the return on equity (ROE). It is significant because it offers data about the impact of operating and financial leverages on financial performance in Jordanian industrial companies. Such data shall enable the owners and managers of the Jordanian industrial companies to improve their financial performance and increase their profits

The researcher aimed to answer the questions below:

Q.1. Does the operating leverage have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA)?

Q.2. Does the financial leverage have statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA)?

Q.3. Does the operating leverage have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE)?

Q.4. Does the financial leverage have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE)?

The researcher aimed to test the hypotheses listed below:

H0.1. Operating leverage doesn't have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA).

H0.2. Financial leverage doesn't have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA).

H0.3. Operating leverage doesn't have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE)

H0.4. Financial leverage doesn't have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE).

The researcher presented the study's model below

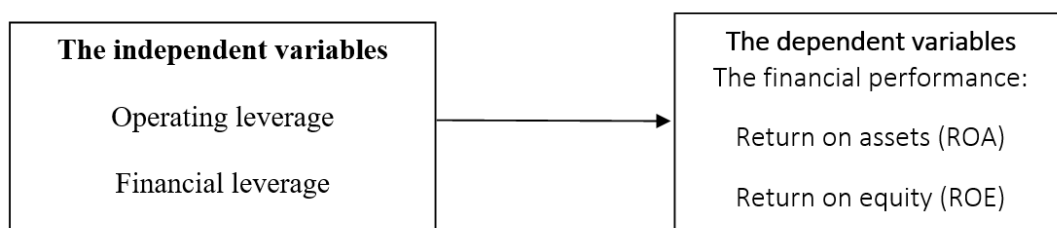


Fig.1: The study's model

The researcher presented the study's limits below:

Spatial limits: The researcher targeted the Jordanian industrial companies

Temporal limits: The researcher targeted the period (from 2017 to 2021).

The operational definitions of the study's terms are listed below:

\*First: Operating leverage (DOL): It is represented in the effect of any change that occur in the operational aspects on the company's profits. It is measured through using the following equation.

Operating leverage = The percentage change in the earnings before deducting the interest and tax (EBIT) / The percentage change in the sales volume (SR).

\*Second: Financial leverage (DFL): It is represented in the effect of any change to the financial aspect on the earnings per share of the company. It is measured through using the following equation.

Financial leverage = Percentage change in EPS / Percentage change in earnings before interest and tax.

\*Third: The financial performance: It is represented in the extent to which the activities contribute to creating an added value for the company through the use of the available financial resources.

The financial performance in this study is measured through the return on assets (ROA) and the return on equity (ROE). Further details about that are listed below:

1- Return on assets (ROA): It is measured through using the following equation

Return on assets (ROA) = Income before interest and after tax (NOPAT) / (total assets)

2- Return on equity (ROE) is measured by the following equation.

Return on equity (ROE) = (The income available to common stockholders) / (The total equity of common stockholders).

## **2. Theoretical framework**

Karma & Sander (2006) add that financial leverage affects the risk of equity. They also add that having a high financial leverage shall lead to facing high risk by shareholders. Akhtar et al. (2012) add that there is a positive relationship between financial leverage and financial performance in the fuel & energy sector in Pakistan. They also add that having a high financial leverage shall lead to having a high financial performance and high profitability in the companies operating in the latter sector.

Houmes et al. (2012) add that operating leverage has an impact on systematic risks. Innocent et al. (2014) add that debt ratio (DR), debt-equity ratio (DER), and interest coverage ratio (ICR) represent financial leverage. They add that the return on assets (ROA) represent the financial performance. They add that debt ratio (DR) and debt-equity ratio (DER) have a negative relationship with the return on assets (ROA) in the companies operating in the pharmaceutical industry in Nigeria. They add that the interest coverage ratio (ICR) has a positive relationship with the return on assets (ROA) in the latter companies.

Wabwile et al. (2014) add that there is a negative correlation between financial leverage and financial performance when measured by return on assets (ROA) and return on capital (ROC) in commercial banks in Kenya. Perinpanathan (2014) adds that there is a negative relationship between the financial leverage and the financial performance of John Keells Holdings PLC in Sri Lanka. De Medeiros et al. (2016) add that the operating leverage has an impact on stock returns in the Brazilian market. Ashraf et al. (2017) add that the operating leverage affect the performance of Islamic equity portfolios (IEPs).

Dey et al. (2018) add that the financial leverage has a positive effect on the return on equity (ROE) in the public joint stock manufacturing companies in Bangladesh. They add that the financial leverage doesn't have any impact on earnings per share (EPS) in the latter companies. They add that the financial leverage negatively affects the return on assets (ROA) and Tobin's Q in the latter companies.

Chen et al. (2019) add that financial leverage affects profitability and financial performance. According to Zhao et al. (2020), financial leverage affects economic growth. It is also affected by economic growth. Zhao et al. (2020) add that having a high financial leverage shall negatively affect the overall economic growth. Chen (2020) add that there is a negative relationship between financial leverage and the companies' performance when measured by the return on assets (ROA).

Asraf, & Mia Muchia Desda (2020) add that financial and operating leverage don't have any impact on

profitability. The latter profitability was measured by the return on assets (ROA) and return on equity (ROE). According to Ma et al. (2021), there is a relationship between ownership reforms and financial leverage.

According to Paeleman et al. (2023), increasing the financial leverage shall lead to the raise of risks faced by stakeholders and costs incurred by them. That means that financial leverage significantly affects the risks and costs incurred by the stakeholders in companies. The latter researchers also add that the higher the financial leverage ratio is, the lower the sales growth shall be. They also add that the higher the financial leverage ratio is, the higher the employment costs shall be. In simple words, financial leverage affects the sales growth and employment costs (Paeleman et al., 2023).

Okofu-Dartey (2023) adds that financial leverage is negatively correlated with the growth opportunities available to companies. He also adds that a positive relationship exist between financial leverage and profitability.

### **3. Previous Studies**

#### **3.1. Studies Published in Arabic Language:**

Gharib et al. (2021) conducted a study entitled “The Impact of Financial Leverage on the Financial Performance Indicators of the Company” An Experimental Study on Egyptian Shareholding Companies”

The latter researchers explored the effect of financial leverage on the financial performance of the joint-stock companies listed on the Egyptian Stock Exchange. The financial performance in the latter study is represented in the return on assets (ROA), return on equity (ROE), return on sales (ROS), and return on investment (ROI). The study’s population is represented in all the companies listed on the Egyptian Stock Exchange. The latter researchers sampled seventy one (71) companies that are listed on the Egyptian Stock Exchange. They targeted the period (2014 – 2018). The regression analysis was conducted to test the hypotheses and analyse the collected data. It was found that there is a significant positive relationship between financial leverage and financial performance measured by the return on equity (ROE). It was found that there is a significant positive relationship between financial leverage and financial performance measured by the return on investment (ROI).

Abdel Moneim (2020) conducted a study entitled: “The Impact of Financial Leverage on Financial Performance and Stock Returns: An Experimental Study on Banks Registered on the Egyptian Stock Exchange”

The latter researchers explored the impact of the financial leverage on the financial performance of the banks listed on the Egyptian Stock Exchange and their stock returns. In order to test the hypotheses of the study, fourteen (14) banks were sampled. They were listed on the Egyptian Stock Exchange. The latter researchers targeted the period (2013 - 2018). They used the general least squares method, and the weighted least squares method. They also used the quantitative regression method, and the strong regression method. It was found that there is a positive and significant relationship between financial leverage and the financial performance of the sampled banks. It was found that financial leverage has a positive and significant effect on the financial performance of the banks listed on the Egyptian Stock Exchange. The results also show that there isn’t any significant relationship between financial leverage and the stock returns of the sampled banks. It was found that financial leverage does not have any significant impact on the stock returns of the sampled banks.

-Al-Tarban and Belkasem (2019) conducted a study entitled "The Impact of Leverage on the Performance of Libyan Commercial Banks - An Applied Study on Al-Wahda Bank"

The latter study explored the impact of financial leverage on the performance of Libyan commercial banks. It explored this impact through analyzing the financial statements of the sampled banks. The sampled banks’ performance was measured through the ratio of liquidity, lending, profitability and capital efficiency ratio of the sampled banks. It was found that there is an increase in the value of the liquid assets of the Libyan commercial banks. It was found that the banks have idle value of assets.

Many assets owned by the Libyan commercial banks are in the Central Bank of Libya as deposits. Those deposits are characterized by a high degree of liquidity and a low profitability. That significantly affected the profitability rates of the sampled banks.

- Ali Al-Din (2019) conducted a study entitled “The Impact of Lifting on the Total Return and Risk of Industrial Companies”

This study aimed to explore the effect of leverage on the overall return and risks of the industrial companies affiliated with the General Authority for Investment and Free Zones. The sampled companies were chosen from nine (9) different industrial sectors. One thousand fifty-seven (1057) industrial companies were sampled. The researcher targeted the period (2011 - 2016). They used a panel data model with fixed effects. They used the least squares method. It was found that the operating leverage and the financial leverage have a positive and significant effect on the returns, and the total risks of the industrial companies. It was found that the financial leverage and the long-term mixture of leverage have an impact on the return and the assets of the industrial companies. In addition, it was found that liquidity doesn't have any impact on the total risk. The latter researcher recommends focusing on raising the operating leverage and limiting financial leverage in industrial companies.

Azab and Mahmoud (2019) conducted a study entitled "The Effect of Leverage on the Market Value of the Shares of Iraqi Commercial Banks, An Applied Research in the Bank of Baghdad for the Period (2010-2019)"

This study aimed to identify the effect of financial leverage on the market value of the share. The latter researchers sampled several Iraqi private commercial banks listed on Iraq Stock Exchange during the period (2010 – 2019). Data was obtained from the annual reports of the sampled Iraqi private commercial banks. The financial leverage ratios are represented in (the property right multiplier, and the cash balance ratio). The hypotheses were tested. After analyzing data, it was found that financial leverage has a significant impact on the market value of the share. The researchers recommend implementing a balanced policy targeting the financial leverage. They recommend conducting similar studies with targeting other sectors.

Zaher (2018) conducted a study entitled "Analysis of liquidity, profitability, financial leverage in the light of banking risk management, the Commercial Bank of Iraq, a case study 2005-2015"

This study aimed to analyze the liquidity management of each asset and component in the Commercial Bank of Iraq. It aimed to shed a light on the management of liabilities, which represent the total short-term loans. It aimed to explore the effect of financial leverage on the commercial profitability of the Commercial Bank of Iraq. The researcher targeted the period (2005 - 2015). Standard models were developed. It was concluded that the signs of the parameters correspond to the logic of economic theory for all models. The statistical tests are important in terms of the quantitative aspect. The profitability behavior of the targeted bank was upward due to its size. It was found that the targeted bank was successful in managing liquidity. However, the targeted bank failed in managing the liabilities. That led to having a low financial leverage ratio.

### **3.2. Studies Published in English language:**

-Santika (2022) conducted a study entitled “Effect of Operational Risk on Financial Performance in Banking Industry IDX”

The latter study aimed to identify the effect of the organizational risk on the financial performance of the banks listed on Indonesia Stock Exchange (IDX). The latter performance was measured by the return on assets (ROA), the return on equity (ROE), net independent variable interest income, average asset turnover, total operating expenses, interest over the years, and the exchange rate. The latter researcher aimed to identify the impact of operational risks on the financial performance of the banks listed on during the COVID-19 pandemic. It was found that changes were made to the work patterns adopted by many banks in Indonesia. It was found that the presence of COVID 19 is capable of changing the pattern of operations adopted by the sampled banks in Indonesia. The financial performance of any company serves as a measure of its profits or losses during a specific period of time. The latter

researcher recommends shedding a light on the way in which risks affect financial performance. That shall lead to having a better understanding for the impact of risks on probability and bankruptcy.

Ehiedu et al (2022) conducted a study entitled (Financial Leverage and Performance Of Listed Oil and Gas Firms In Nigeria)

The latter study aimed to explore the relationship between financial leverage and the financial performance of the oil and gas companies listed on Nigeria Stock Market. It targets the period (2011 – 2020) (10 years). It also aimed to examine the relationship between the financial leverage and the financial performance of the targeted companies. Financial leverage was measured by (short-term debt ratio (STDR), long-term debt ratio (LTDR) and total debt ratio (TDR)). The financial performance was measured by the return on assets (ROA). The panel data was obtained from ten (10) oil and gas companies that were listed on the Nigeria Stock Exchange. It was analyzed through using several descriptive statistical methods. It was found that the short-term debt ratio (STDR) has a significant impact on the return on assets (ROA). It was found that the long-term debt ratio (LTDR), the total debt ratio (TDR) and the debt-to-equity ratio (DTER) don't have any significant impact on the return on assets (ROA). It was found that the financial leverage does not have any significant impact on the financial performance of the oil and gas companies listed on Nigeria Stock Market.

-Towo (2022) conducted a study entitled “Financial Leverage and Financial Performance of Savings and Credit Co-operative Societies in Tanzania”

The latter study aimed to explore the relationship between the financial leverage and the financial performance of Savings and Credit Cooperative Societies in Tanzania (SACCOS). The researcher collected panel data set of one hundred fifteen (115) institutions that are members in SACCOS in Tanzania. He targeted the period (2011 – 2014). The researcher explored the direct relationship between financial leverage and the financial performance of SACCOS. He explored the soft effect of board meetings on the relationship between financial leverage and the financial performance of SACCOS. After analyzing data, it was found that leverage is significantly and negatively correlated with the financial performance of SACCOS. In addition, it was found that board meetings have a significant positive moderate effect on the relationship between financial leverage and the financial performance of SACCOS. Furthermore, the researcher believes that SACCOS in Tanzania needs to incubate more funds to mobilize internal funds from its members rather than relying on debt. This could reduce the extent of dependence on debt.

Papadimitri et al. (2021) conducted a study entitled (Financial leverage and performance: the case of financial technology firms).

The latter researchers explored the impact of financial leverage on performance in the financial technology companies in USA. They sampled 146 U.S financial technology companies. They targeted the period 2000–2016. Financial data was obtained and analyzed. It was found that financial leverage has a negative impact on profitability and risk-adjusted performance. The severity of the latter impact is affected by the company's age.

Senan et al. (2021) conducted a study entitled (An empirical analysis of financial leverage and financial performance: Empirical evidence from Indian listed firms)

The latter study examined the determinants of the financial performance, company liquidity and financial leverage of the listed Indian companies. The researchers used fixed models (i.e. pools, fixed effects, and random models). They used general moment methods (GMM). It was found that the financial leverage (FINLE) is determined by the total liabilities to the total assets ratio. It was found that the current ratio and the quick ratio are used as fixed liquidity factors. In addition, a set of determinants of financial performance (e.g. return on assets, profit after tax, return on capital employed, return on equity, and Tobin-Q) were used as independent factors. It was found that the profits after deducting tax, return on equity, return on capital employed, and Tobin-Q are the most important variables affecting leverage in the listed Indian companies. In addition, it was found that profit after tax, return on invested capital, return on equity, and Tobin-Q have a significant impact on leverage. It was

found that the current ratio and quick ratio have a significant effect on the leverage of the listed Indian companies.

Kalash (2021) conducted a study entitled “The financial leverage–financial performance relationship in the emerging market of Turkey: the role of financial distress risk and currency crisis”

The latter study aimed to examine the way in which risks of financial distress and currency crisis affect the relationship between financial leverage and financial performance. The researcher used data obtained from two hundred (200) companies that were listed on the Istanbul Stock Exchange. He targeted the period (2009 – 2019). 1950 fixed-year observations were sampled. Combined normal least squares, random effects, constant effects, and GMM models of the two-step system were used to test the hypotheses. After analyzing data, it was found that financial leverage has a negative significant effect on the financial performance of the sampled companies. The latter effect is stronger in the companies facing a high risk of financial distress. In addition, the latter researcher offered evidence indicating that a currency crisis exacerbates the negative correlation between leverage and performance. The findings of this study have important implications for the firms operating in the emerging markets. Managers can enhance company performance through reducing the level of leverage, especially in the companies facing a high risk of financial distress. Moreover, the declines in the level of debt matters more when having currency crises.

Zelalem (2020) conducted a study entitled: (The Impact of Financial Leverage on the Performance of Commercial Banks: Evidence from Selected Commercial Banks in Ethiopia)

The latter researcher explored the impact of financial leverage on the performance of commercial banks in Ethiopia. He sampled ten commercial banks in Ethiopia. He targeted the period (2008-2017). He collected the required financial data and analyzed it. He found that financial leverage (measured by debt Ratio) has a negative impact on performance when measured by ROA and ROE.

Dalci (2018) conducted a study entitled: "Impact of financial leverage on profitability of listed manufacturing firms in China"

The latter researcher explored the impact of financial leverage on the profitability of the listed manufacturing firms in China. He sampled 1503 manufacturing firms in China. He targeted the period (2008-2016). He obtained financial data from ORBIS database and analyzed it. The regression analysis was conducted. The researcher found that financial leverage has a positive impact on the profitability of the listed manufacturing firms in China

Iqbal & Usman (2018) conducted a study entitled (Impact of Financial Leverage on Firm Performance)

The latter researchers explored the relationship between financial leverage and the performance of the composite textile companies in Pakistan. The Pakistani textile companies included in the PSX (100 Indexes) serve as the study’s population. The latter researchers targeted the period (2011 – 2015) (i.e. five years). They sampled the top 16 companies. Descriptive statistical methods were used. Correlation analysis was conducted. Aggression model was used. It was found that financial leverage has a negative and significant effect on the return on equity of the sampled companies. It was found that financial leverage has a positive significant effect on the return on assets of the sampled companies. It was found that the amount of debt has a positive effect on the return on assets (ROA) of the sampled companies. It was found that financial leverage has a positive effect on performance in case the amount of debt isn’t greater than the amount of equity.

Perinpanathan (2014) conducted a study titled (Impact of Financial Leverage on Financial Performance Special Reference to John Keels Holdings PLC Sri Lanka).

The latter researcher explored the impact of financial leverage on the financial performance of companies in Sri Lanka. He targeted John Keels Holdings PLC as a model. He targeted the period (2006-2012). He collected financial data about the company and analyzed it. He found that there is a negative relationship between the financial leverage and the financial performance of the John Keells Holdings PLC.



## 4. Methodology

### 4.1. The Study's Approach

The researcher adopted a descriptive analytical approach. He also adopted a quantitative approach to reach results. According to Al-Derbashi, and Moussa (2022), the latter approach is usually adopted for developing a new theory or checking the validity of theoretical assumptions or hypotheses.

### 4.2. Population and Sample

The study's population is represented in all the Jordanian industrial companies operating in Jordan. The study's sample consists from twenty three (23) Jordanian industrial companies. The sampled companies borrowed funds. The value of such borrowed funds represent more than 10% of their owned capital. The sampled companies are listed in the table below. 105 observations were sampled.

Table 1: The names of the sampled companies and their debt to capital ratios

No.	The Company's name	The debt to capital ratio
1	Jordanian for the processing and marketing of poultry	15%
2	Jordanian dairy	11%
3	General for mining	17%
4	Arabia for the aluminum industry	13%
5	National Steel Industry	20%
6	Jordanian phosphate mines	15%
7	Vegetable oil factories	17%
8	Jordan Pipe Industry	14%
9	Middle East Engineering Industries	19%
10	Middle East Specialized Cables	16%
11	garment industry	11%
12	Ready mix concrete and construction supplies	21%
13	Integrated for multiple projects	22%
14	Jordanian cement factories	19%

15	National for the manufacture of electric cables and wires	14%
16	Jordan Steel	15%
17	National Aluminum Industry	17%
18	Arabia for electrical industries	14%
19	National Petroleum	18%
20	Jordan magnesium	16%
21	Union for the production of tobacco and cigarettes	14%
22	Arab Center for Pharmaceutical Industries	15%
23	Public investments	24%

#### 4.3. Data Analysis Methods:

The researcher used the panel data analysis methods. He also used several descriptive statistical methods. He tested the study’s hypotheses through using the multiple regression model. The latter model sheds a light on the effect of the independent variables on the dependent variables. The researcher used the SPSS program for analysing data.

Regression analysis

The following equation illustrates the relationship between operating and financial leverages from one hand and ROA from another hand:

$$ROA_{it} = \beta_0 + \beta_1 OPL_{it} + \beta_2 FLE_{it} + \epsilon_{it} \quad (\text{Eq.1})$$

Whereas:

ROA<sub>it</sub> = return on assets for the firm (i) in a year (t).

OPL<sub>it</sub> = operating leverage for the firm (i) in a year (t).

FLE<sub>it</sub> = financial leverage for the firm (i) in a year (t).

The regression analysis was conducted for the first model. It was conducted to identify whether there is any impact for operating and financial leverages on the financial performance of the targeted companies when measured by ROA. The results of this analysis can be seen in table (2)

**Table 2: The Application of ROA Equation**

ROA	Coef.	Std. Err.	t	P> t	[95% Conf.
OPL	.0003853	.0055764	0.07	0.945	-.0106756
FLE	-.0034999	.0035293	-0.99	0.324	-.0105002

_cons	.0656752	.0081923	8.02	0.000	.0494259
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Based on table (2), it can be concluded that the operating and financial leverages have an impact on the financial performance of the targeted companies when measured by ROA. That is because the significance value is less than the significance level (0.05). The significance value reflects the nature of the relationship between variables

The following equation illustrates the relationship between operating and financial leverages from one hand and ROE from another hand:

$$ROE_{it} = \beta_0 + \beta_1 OPL_{it} + \beta_2 FLE_{it} + \epsilon_{it} \quad (Eq.2)$$

Whereas:

ROE<sub>it</sub> = The return on equity of firm (i) during year (t).

OPL<sub>it</sub> = The operating leverage of firm (i) during year (t).

FLE<sub>it</sub> = The financial leverage of firm (i) during year (t).

The regression analysis was conducted for the first model. It was conducted to identify whether there is any impact for operating and financial leverages on the financial performance of the targeted companies when measured by ROE. The results of this analysis can be seen in table (3)

Table 3: The Application of ROE Equation

ROA	Coef.	Std. Err.	t	P> t	[95% Conf.
OPL	.0304041	.0157146	1.93	0.056	-.0007695
FLE	.0159526	.0100237	1.59	0.115	-.0039316
_cons	.0305143	.0229551	1.33	0.187	-.0150225

Based on table (3), it can be concluded that the operating and financial leverages have an impact on the financial performance of the targeted companies when measured by ROE. That is because the significance value is less than the significance level (0.05). The significance value reflects the nature of the relationship between variables

## 5. Results and Discussion

### 5.1. Descriptive statistical analysis

The results reached through using the descriptive statistical tools are shown in table (2) below

Table 4: The results reached through using the descriptive statistical tools

Variables Symbol	Obs.	Mean	Median	Std. Dev.	Minimum	Maximum
Continuous Variables						

ROA	105	0.0610952	0.063	0.0094467	0.045	0.082
ROE	105	0.0911058	0.0915	0.0272432	0.012	0.15
OPL	105	1.234381	1.21	0.1677964	1.02	1.79
FLE	105	1.444476	1.42	0.2651269	1.02	1.96

The ROA values range between 0.045 and 0.82 since the average was 0.0610952.

Table 4 indicates that ROE values range between 0.012 and 0.15 since the average was 0.0911058.

Those ratios are accepted as added by Gharib et al. (2021) and Abdel Moneim (2020). The latter researcher aimed to explore the relationship between financial percentages from one hand and operating and financial leverages from another hand.

The financial leverage ratio indicate that there are some firms completely depend on the liabilities since the financial leverage was 1.44476% on average and ranged between 1.96% and 1.02%. On the other hand, operating leverage was 1.234381 on average.

Those ratios are deemed accepted, especially when comparing them with the results of several studies, such as the study conducted by Al-Din (2019). The latter study targeted the industrial companies operating in Jordan

Meanwhile, this study used two indicators to check the multicollinearity problem. The first one is the Pearson correlation coefficients which indicate the existence of the multicollinearity problem when the correlation coefficient is more than 0.8 between two variables (Gujarati, 2004). The second one is the variance inflation factor (VIF) and tolerance factor (1/VIF) as an additional step confirming with panel data assumptions. The multicollinearity problem exists when the value of the variance inflation factor is higher than 10 and the value of the tolerance factor is lower than 10 present (Gujarati, 2004; Baltagi, 2008). However, the result of the Pearson correlation indicates there is no correlations exceed 0.8 between any of the study variables. In return, the variance inflation factor for all variables is lower than 10 and higher than 10% for the tolerance factor. Therefore, the multicollinearity problem does not exist in the study sample.

## 5.2. Multivariate analysis

This study is carried out through two stages to determine the appropriate regression model for the study. The first stage involves making a comparison between the fixed effect regression model (fe) and the random effect regression model (re) through using the Hausman test. The second stage used if the random effect is appropriate more than the fixed effect by making a comparison between the random effect regression model (re) and the pooled OLS through using the Breusch-Pagan Lagrange multiplier test (LM) (Dougherty, 2007; Gujarati & Porter, 2009). However, each Hausman's tests and LM tests indicate that the random effect is the most appropriate to be used in this study for the first model and the second model. Since the Hausman test results are higher than the significant level at 0.05 and the results of the LM test are significant at 0.05 thus this study used the random-effect GLS regression to analyses data.

In regards to the heteroscedasticity and the autocorrelation problem, this study used the Modified Wald Test for GroupWise Heteroscedasticity (MWT) and the Wooldridge Test (WT) for autocorrelation. These results, in table 5, indicate that the regression model in this study suffered from the heteroscedasticity problem while the autocorrelation problem does not exist. Therefore, in order to avoid a heteroscedasticity problem, the correcting robust standard error estimates method for the

random-effect GLS regression was used (Hoechle, 2007).

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The researcher conducted the robust random random-effect GLS regression to explore the relationship between the operating and financial leverages risks from one hand and the financial performance from another hand through using different models (Eq.1& Eq. 2).

Table 5 presents the results of the regression analysis for model 1. The model as a whole is fit and significant at 0.01 (Wald chi2 = 80.14\*\*\*). While the explanatory power of the model was 2.95% (Overall R2= 0.0295) which indicates that only 2.95% of the variation on the dependant variable is explained by the independent and control variables used in the model. The consistent term (*\_Cons*) of this model is positive and significant at p-value < 0.01.

Table 5: The result of the robust Random-effect GLS regression

Variables	Model 1 : reg ROA OPL FLE		
	Coeff.	Z(t-static)	P>Z
OPL	0.0003853	0.07	0.946
FLE	-.0034999	-1.44	0.149
<i>R-sq</i>	0.0295		
<i>Wald Chi2(F-value)</i>	80.14***		
*, **, ***= p-value < .10, .05, .001			

Q.1. Does the operating leverage have any significant impact on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA)?

Q.2. Does the financial leverage have any significant impact on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA)?

Operating and financial leverages risks have an insignificant relationship with the ROA which is a measure for firm performance. Table 5 presents that Z = 9.46 for the operating leverage and 0.149 for the financial leverage with insignificant p-value = for this relationship.

Based on the results of the study, the financial and operating leverages have a great impact on the finance performance of companies in general and industrial companies in particular. That applies when finance performance is measured by the return on assets (ROA). The result in this regard is in agreement with the results reached by: Gharib et al. (2021); Abdel Moneim (2020); Zaher (2018); and Ehiedu et al (2022).

To evaluate the firm performance in another way, the researcher included another measure for firm performance (see Eq.2). Table 6 presents the robust random random-effect GLS regression result for model 2. The model as a whole is fit and significant at 0.01 (Wald chi2 = 16.33\*\*\*). While the explanatory power of the model was 4.54%. The consistent term (*\_Cons*) of this model is positive and significant at p-value < 0.01.

Table 6: The result of the robust Random-effect GLS regression Model 2

Variables	Model 1 : reg ROE OPL FLE		
	Coeff.	Z(t-static)	P>Z
OPL	0.0315822	6.16	0.000
FLE	0.0089297	3.27	0.004
R-sq	0.0454		
Wald Chi2(F-value)	16.33***		
*, **, ***= p-value < .10, .05, .001			

Q.3. Does the operating leverage have any significant impact on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE)?

Q.4. Does the financial leverage have any significant impact on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE)?

Consistent with the study expectations, both of operating and financial leverages risks has a significant relationship with the ROE which is a measure for firm performance. Table 6 presents that  $Z = 3.64$  for the operating leverage with a positive significant  $p$ -value = 0.000. While;  $Z=1.95$  for the financial leverage with a positive significant  $p$ -value = 0.004 for this relationship. Thus, firm with a higher operating and financial leverages have a high firm performance.

Based on those results, the operating and financial leverages have a significant impact on the financial performance of the Jordanian industrial companies. That applies when the financial performance is measured by the return on equity (ROE). The result in this regard is consistent with the results of the studies conducted by Gharib et al. (2021); Abdel Moneim (2020); Zaher (2018); Ehiedu et al (2022). The latter studies found that there is a relationship between operating and financial leverages from one hand and the financial performance of industrial companies when measured by the return on equity (ROE) from another hand.

Based on the data displayed in table (5), the researcher reached the following results:

Based on table (3), there is a statistically significant relationship between operating leverage from one hand and financial performance from another hand when measured by ROA and ROE. That was concluded because the significance value is 0.000. The latter value is considered statistically significant at the statistical significance level of ( $\alpha \leq 0.05$ ). That means that the first and third hypotheses are rejected. The rejected first hypothesis states the following: (Operating leverage doesn't have any statistically significant impact – at the significance level of ( $\alpha \leq 0.05$ )– on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA)).

The rejected third hypothesis states the following: (Operating leverage doesn't have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE)). In terms of the results related to the first and third hypotheses, they are not in agreement with the result reached by Asraf, & Mia Muchia Desda (2020). The latter researchers found that operating leverage don't have any impact on profitability. The results related to the first and third hypotheses are not in agreement with the result reached by Ali Al-Din (2019). The latter researcher found that operating leverage has a significant

impact on returns.

Based on the data in table (6), there is a statistically significant relationship between financial leverage from one hand and financial performance from another hand when measured by ROA and ROE. That was concluded because the significance value is 0.000. The latter value is statistically significant at the statistical significance level of ( $\alpha \leq 0.05$ ). That means that the second and fourth hypotheses are rejected.

The rejected second hypothesis states the following: (Financial leverage doesn't have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on assets (ROA)). In terms of the result related to the second hypothesis, it is in agreement with the one reached by Zelalem (2020). That's because the latter researcher found that financial leverage has a negative impact on performance when measured by ROA. The result in this regard can be attributed to the fact that using the borrowed funds to purchase assets in the aim of getting a return may provide the company with returns from such assets. Such returns may be represented in the profits gained through purchasing an existent restaurant to operate it. They shall enable companies to improve their financial performance and get rid of financial crises

The rejected fourth hypothesis states the following: (Financial leverage doesn't have any statistically significant impact - at the statistical significance level of ( $\alpha \leq 0.05$ ) - on the financial performance of the Jordanian industrial companies when measured by the return on equity (ROE)). In terms of the result related to the fourth hypothesis, it is in agreement with the one reached by Zelalem (2020). That's because the latter researcher found that financial leverage has a negative impact on performance when measured by ROE. The latter result is in agreement with the result reached by Gharib et al. (2021). The latter researcher found that there is a significant relationship between financial leverage and financial performance measured by the return on equity (ROE). The result in this regard can be to the fact that using borrowed funds to make investments may lead to generating income. That shall lead to providing the shareholders with more funds.

## **6. Conclusion**

The researcher of the present study aimed to identify the impact of operating and financial leverages on the financial performance of the Jordanian industrial companies.

It was found that the results of this study are in agreement with the results of several studies. The researcher found that operating and financial leverages have an impact on the financial performance of the Jordanian industrial companies. That applies when the financial performance is measured by ROA and ROE. The researcher found that there is a relationship between operating and financial leverages from one hand and financial performance from another hand when measured by the return on assets (ROA) and the return on equity (ROE).

In terms of the implications of the results, the researcher believes that the results shall enable Jordanian industrial companies to improve its financial performance and acquire more assets. He believes that the results shall enable those companies to rely less on debt for funding their operations.

The researcher recommends conducting studies about the impact of operating and financial leverages on the financial performance with targeting companies operating in other sectors such as agricultural, banking, and trading sectors. He also recommends conducting studies about the impact of operating and financial leverages on the risks faced by banks and companies in Jordan. He also recommends conducting studies about the impact of operating and financial leverages on the value of banks and companies in Jordan. He also recommends conducting studies about the impact of operating and financial leverages on the effectiveness of the investment decisions made by banks and companies in Jordan.

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