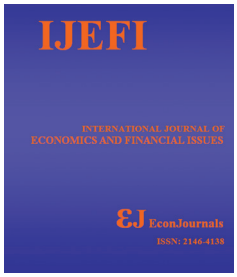

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The Performance of Selected Listed Firms in Jordan between Two Crises

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ABSTRACT

This study aims at investigating the impact of Covid-19 pandemic and Global Financial Crisis (GFC) on the performance of selected listed firms in Jordan. To achieve this objective, the study uses panel data for twenty firms over the period 2001-2020, obtained from Amman Stock Exchange database. All the study variables were found to be stationary at level, therefore, fixed and random effect models were applied to estimate two econometric equations with two performance indices. The results have revealed that both inflation and GFC have insignificant effect on the profitability of these firms, while debt ratio has a significant negative impact on their performance. The outcomes have also demonstrated the significant negative impact of Covid-19 pandemic on the profitability of such firms. Based on these results, the study has introduced some recommendations that may help in mitigating the adverse consequences of Covid-19 pandemic and in improving the profitability of Jordanian firms.

Keywords: Covid-19 Pandemic, Global Financial Crisis, Performance, Panel Data
JEL Classifications: I15, G01, D21, C23

1. INTRODUCTION

The outbreak of the novel COVID-19 pandemic has necessitated substantial worldwide governmental efforts in order to prevent the spread of the pandemic, protect inhabitants' lives and prevent the health services from breakdown. Governments were forced to implement strict quarantine measures due to the extremely infectious nature of Coronavirus. The social and economic effects of COVID-19 pandemic are evolving seriously as a result of the quarantine measures citizens movement have greatly dropped, which has eventually led to deteriorated spending power and declined demand for goods and services. Thus, many worldwide firms were forced to interrupt or cut down production. These negative consequences were reflected on markets, employment and workers moral, resulting in a stagnant economy around the world.

At the macro level, the outbreak of COVID-19 pandemic has resulted in the most severe global recession since the Great Depression in 1929. Nevertheless, Fernandes (2020) argued that the economic effects of COVID-19 pandemic are being undervalued at present as a result of excessive dependence on historical comparisons with similar incidents, such as SARS epidemic and the GFC in 2008-2009. At the micro level, the COVID-19 pandemic outbreak may significantly affect the firms' performance. UNCTAD (2020) has shown that the world's top 5000 multinational enterprises (MNEs) have lately reviewed and decreased their estimated earnings by 9%, on average, as a result of COVID-19 pandemic adverse effects. The earnings reduction would eventually result in pay cuts and job losses. Fu and Shen (2020) also found that many countries have faced corporate bankruptcies and job losses attributed to this pandemic outbreak.

On 2nd March 2020, the Jordanian government declared the first incident of COVID-19 in the kingdom and started to apply strict quarantine measures to avoid the pandemic spread. On 17th March, Jordan closed all the borders and stopped local and international

air travels. On 21st March, a full lockdown was enforced where citizens were prevented from leaving their homes, and all the sectors in the country were closed with exception of the vital ones such as utilities and telecommunications. In early May, the government started gradual opening of the sectors provided the implementation of stringent health instructions to ensure the social distancing and safety of citizens in addition to the enforcement of partial quarantine. Consequently, these strict measures have negatively affected the aggregate demand, especially consumption and imports (Kebede et al., 2020). In the short run, the real gross domestic product of Jordan fell by 3.3% in the second quarter of 2020 compared with the same period in 2019 (Central Bank of Jordan, 2021), while, the long-run effects on the economy, while yet not fully estimated, are anticipated to be negatively substantial.

Jordan like other countries in the world has been affected by the GFC which was caused by the subprime mortgage crisis in the United States, but with a smaller scale, since the Jordanian financial market does not often use complex financial instruments, such as derivatives. This behavior has led the market to be stable and less vulnerable to abroad fluctuations in spite of its small size (Alnajjar et al., 2010). Therefore, it is necessary to estimate the effects of such major incidents on the performance of Jordanian listed firms which are the base component of Jordanian economy. This paper uses the financial data of selected listed non-financial Jordanian companies from 2001 to 2020 to quantify the COVID-19 pandemic and GFC effects on firms' performance. The study uses the total assets, total debt to total asset ratio and inflation as explanatory variables, in addition to two dummy variables representing the economic incidents; COVID-19 pandemic and GFC, in order to investigate the mechanism of the pandemic effect.

Jordan is one of the small economies in the Middle East. The lack of its natural resources, increasing flows of refugees, wide-spread corruption, excessive bureaucracy, and political instability in the region have lowered its economic growth and increased the rates of unemployment and poverty. Jordan economy has actually faced two major crises during the last twenty years; GFC and COVID-19 pandemic. Zubair et al. (2020) suggested that economic recession of 2008 was caused by subprime mortgage crisis which is an internal factor of the financial system, while the current economic recession is attributed to an external factor of the financial system; largely attributed to the strict quarantine measures subsequent to the COVID-19 pandemic. Therefore, the adverse impact of both crises on the Jordanian economy may differ greatly, which necessitates conducting several studies to analyze their effects and suggest responses or solutions to the consequences of such crises. The problem of this study lies in determining the comparative effects of COVID-19 pandemic and GFC on the performance of selected Jordanian listed non-financial firms in general. This study tries to answer the following question:

What is the relative impact of GFC and COVID-19 pandemic on the performance of Jordanian listed non-financial firms?

This paper contributes to the literature as follows:

1. The study highlights the profitability of selected listed firms in Jordan which is a critical and important issue for various stakeholders. The findings of this paper may help the top management of such firms in making proper decisions and contingency planning for unexpected conditions. The study will also provide an insight into activities which require consideration, as well as encourage innovations and implementation of bright ideas that add value to Jordanian firms, improve their performance and ultimately boost the Jordanian economy.
2. The study will help in determining the crisis that has the greatest adverse effect on the profitability of Jordanian non-financial firms during the last twenty years, since previous studies have not addressed this issue.
3. The study urges to focus on improving the health sector beside other sectors, in order to control epidemics that have a great negative impact on the performance of most firms in the world, since this impact is not less harmful than that of economic and financial crises.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

Success and continuity of a firm depend on its performance that is commonly measured by applying different methods of financial analysis, such as profitability and market value ratios. These ratios represent the main indices of the overall efficiency and performance of firms (Tangen, 2003). According to the traditional neo-classical view, the size of the firm is a major determinant of its profitability as a result of economies of scale (Surajit and Saxena, 2009). The concept of economies of scale implies that a big firm can produce items on much lower costs when compared to a small firm, which represents a competitive advantage a large firm has over a small one. Moreover, Bayyurt (2007) argued that big firms have the opportunity to work with slight competition in more profitable fields that require large resources, since such firms can obtain the required capital. In line with these arguments, the firm size is expected to have a positive effect on the profitability and market value of the firm (Tangen, 2003). In fact, many empirical studies have investigated the effect of firm size on profitability; Lee (2009) applied fixed effect dynamic panel data model on a sample of 7000 public firms operating in USA over the period 1987-2006. He has found a positive relationship between the size and profitability of firms. Nevertheless, some studies such as Kouser et al. (2012) and Oyelade (2019) argued that large firms exhibit a negative relationship between their size and profitability due to the existence of corruption and conflict of interests between firms' managers and owners, as well as diseconomies of scale. In economic theory, the concept of diseconomies of scale means that when a firm expands beyond its optimal size level, it may become inefficient in managing its operations and suffer from poor coordination between its departments or divisions, resulting in rising the costs of production and declining profits.

Corporate finance has proposed another major determinant of firm profitability; leverage or debt financing. Basically, the capital structure is the mix of debt and quity used by corporates to finance their assets (Azhagaiah and Gavoury, 2011). Firm stakeholders are often concerned with the capital structure, since the firm could

employ either an increased proportion of debt financing or a very limited one when deciding its capital structure, thus the decision on capital structure has an inevitable impact on the firm's performance (Gill et al., 2009). Azhagaiah and Gavoury (2011) hypothesized the relationship between firm's performance and capital structure measured by debt to total assets ratio, on a sample of 102 Indian information technology firms listed on Bombay Stock Exchange over the period 1999-2007. Their results have implied that firm profitability measured by both return on assets (ROA) and return on equity (ROE) is negatively influenced by debt financing. Moreover, Dogan (2013) examined the profitability of 200 listed companies in Istanbul Stock Exchange over the period 2008-2011. He has used ROA as an indicator of firm profitability and several indicators of firm size, such as total assets, total revenues and employees' number. The results of his analysis have concluded a positive relationship between size indicators and firm profitability. He has also used leverage rate and firm age as control variables and found a negative impact on ROA for both variables. Similarly, Alghusin (2015) examined the impact of financial leverage and firm size on the profitability of the company in proxy of ROA. His data were collected from 25 listed Jordanian industrial companies between the years 1995 and 2005. He has found a significant negative effect of the financial leverage on profitability of industrial companies; thus, he has suggested that the industrial companies can increase their profitability by minimizing debt and increasing financial assets compared with total assets. Another study has investigated the effect of capital structure on profitability measured by ROE, using a sample of 92 Malaysian listed firms over the period 2009-2011, and the results have revealed a significant negative impact of debt ratio on profitability, suggesting that profitable companies have relied on equity or shares issuance as their key financing choice (Hamid et al., 2015).

A commonly used macro-economic determinant of firm's profitability is inflation that is considered as an external risk factor. Perry (1992) argued that the effect of inflation on bank's profitability is dependent on the accuracy of anticipating inflation. In other words, predicting inflation correctly could positively affect the bank profitability, since the bank could increase its profit by adjusting interest rates in the right direction, while the failure in predicting inflation could adversely affect the bank profitability due to rising costs attributed to improper adjustment of interest rates. Empirical studies of the inflation-profitability relationship have actually reported mixed results; positive, negative and no correlation. Odusanya et al. (2018) has analyzed the data of 114 listed firms on Nigerian Stock Exchange over the period 2008-2012 and found that short-term debt to total assets ratio and inflation rate are negatively correlated with the firm performance. Similarly, Kanwal and Nadeem (2013) found that inflation has a significant negative effect on profitability measured by both ROA and ROE. However, several studies have found insignificant effect for inflation on profitability (Naceur, 2003). Alper and Anbar (2011) examined the bank-specific and macroeconomic determinants of banks' profitability in Turkey over the period 2002-2010. The empirical findings have implied a positive but insignificant relationship of inflation with ROA and ROE. Similarly, Sufian (2012) examined the performance of 77 Bangladeshi, Sri Lankan and Pakistani commercial banks between 1997 and 2008. The empirical findings have emphasized that inflation has insignificant impact on banks' profitability.

Firms' performance is usually adversely affected by external shocks that dictate the implementation of coping strategies during crises. Hofer (1980), for example, suggested four basic strategies turned out to be the reference of firms' strategic responses for facing challenges throughout crises periods: revenue generation, product-market relocating, cutting cost and asset reduction. The first two responses are related to business reorientation and aimed at increasing sales and avoiding disturbance of market demand during the crisis. The latter two responses are related to the efficiency of operations and aimed at reducing both operating costs and capital expenditures. Scholars have reached a consensus on Hofer's strategies as firm's choice of surviving strategies during crises periods.

In the aftermath of the GFC, a large variety of empirical studies have investigated firms' performance during an economic recession, and suggested solutions to avoid economic failure; through analyzing the behavior of key financial indicators, such as capital structure, liquidity, profitability, asset structure, growth and creditworthiness during the crisis. These studies have also prescribed the application of financial economics theories during a financial crisis (De Castro et al., 2017; Duarte et al., 2018). In fact, these studies were criticized by Nguyen et al., (2021) who have argued that these studies have ignored the linkage between firms' performance and coping strategies. They have also asserted that when addressing a global pandemic such as COVID-19, the selection of surviving strategies could be influenced by both firms' specific factors and general contextual factors (Nguyen et al., 2021).

Therefore, it is important to determine the channel through which the COVID-19 affects firms' performance. With reference to the real options theory; during periods of high uncertainties and increased external risks, managers usually increase their cash retentions and delay investment decisions to avoid emergencies, which might reduce the profitability of the firm and its tendency of sustainable growth (Zeng et al., 2016). According to Maslow's hierarchy of needs, during a pandemic, consumers' need of being safe and healthy is more serious than that of societal gatherings, which leads to reduced demand (Hagerty and Williams, 2020), thus in the short-run, COVID-19 involves deterioration in firms' performance attributed to the application of quarantine strict measures. On the other hand, the long-run effect of COVID-19 pandemic cannot be easily estimated since the world is still inside the pandemic storm. Despite the existence of similar incidents with less severity in the past, the studies analyzing the social, economic and cultural effects of similar pandemics are rare. The review of available literature on the impact of past incidents has clarified the reduction of return on assets during and in the aftermath of such pandemics (Jordà et al., 2020). Meanwhile, Dias et al. (2021) stressed the role of firm's entrepreneurship in surviving during crises denoted by increased innovations, proactivity and readiness for taking risk. They have found a positive relationship between innovations and proactivity and the firms' performance during the crisis, hence they have suggested that the firms' strategic readiness

for events such as COVID-19 pandemic should be examined in terms of their associations with firms' choices of coping strategies.

Based on the previous literature review, the following research hypotheses are proposed:

H_{01}: *Ceteris paribus*, COVID-19 pandemic has insignificant effect on the performance of Jordanian listed non-financial firms.

H_{02}: *Ceteris paribus*, GFC has insignificant effect on the performance of Jordanian listed non-financial firms.

H_{03}: *Ceteris paribus*, the firm size has insignificant effect on the performance of Jordanian listed non-financial firms.

H_{04}: *Ceteris paribus*, the debt to asset ratio has insignificant effect on the performance of Jordanian listed non-financial firms.

H_{05}: *Ceteris paribus*, the inflation has insignificant effect on the performance of Jordanian listed non-financial firms.

3. DATA AND METHODOLOGY

3.1. Data and Variables

The study has used the financial data of twenty listed Jordanian non-financial firms from 2001 to 2020 as the research sample; ten firms are from services sector and ten firms are from industrial sector. The data were extracted from Amman Stock Exchange (ASE) database. The firms were selected randomly and according to the availability of data for all variables during the chosen study period. The dataset was balanced panel data consisting of 400 observations. The dependent variables are ROA and ROE which measure the ratio of net profits to total assets and net profits to total owners' equity respectively. The five independent variables are as follows: (1) Firm size; given by the total assets logarithm, (2) Total debt to total assets ratio, (3) Inflation; given by the annual percentage change in consumer price index, (4) The dummy variable of "COVID-19 pandemic outbreak time" is 1 after the outbreak (in 2020), or 0 otherwise, and (5) The dummy variable of "GFC occurrence time" is 1 in 2008, 2009 and 2010, or 0 otherwise. Table 1 presents a summary of the variables and their corresponding definitions.

3.2. Methodology

Following the modeling approach of the previous studies such as, Shen et al. (2020), Gharaibeh and Bani Khaled (2020) and Rababah et al. (2020), the study uses the following model to estimate the impact of COVID-19 pandemic and GFC on the firms' performance:

$$ROA_{it} = \beta_0 + \beta_1 LA_{it} + \beta_2 DA_{it} + \beta_3 INF_{it} + \beta_4 CD_{it} + \beta_5 GD_{it} + \varepsilon_{it} \quad (1)$$

Where ROA denoting return on assets is taken as a dependent variable and represents the firm's performance; LA denotes natural logarithm of total assets; DA denotes total debt to total assets ratio; INF denotes inflation; CD denotes COVID-19 pandemic dummy variable; GD denotes GFC dummy variable. β_0 denotes the constant term, (β_1, β_2, β_3, β_4, β_5) are coefficients to be estimated; i represents the firm; t denotes the year, and ε denotes the random error term. This paper focuses on the regression coefficients of CD and GD. If the coefficients are negative, it means that crises have negative effects on firms' performance; otherwise, they have positive effects.

Equation (2) is estimated to measure the impact of the COVID-19 pandemic and GFC on firms' performance using another profitability measure to check for the robustness of results:

$$ROE_{it} = \alpha_0 + \alpha_1 LA_{it} + \alpha_2 DA_{it} + \alpha_3 INF_{it} + \alpha_4 CD_{it} + \alpha_5 GD_{it} + e_{it} \quad (2)$$

Where ROE denoting returns on equity is taken as a dependent variable and represents the firm's performance; α_0 denotes the constant term, (α_1, α_2, α_3, α_4, α_5) are coefficients to be estimated; i represents the firm; t denotes the year, and denotes the random error term.

4. EMPIRICAL RESULTS

4.1. Descriptive Analysis

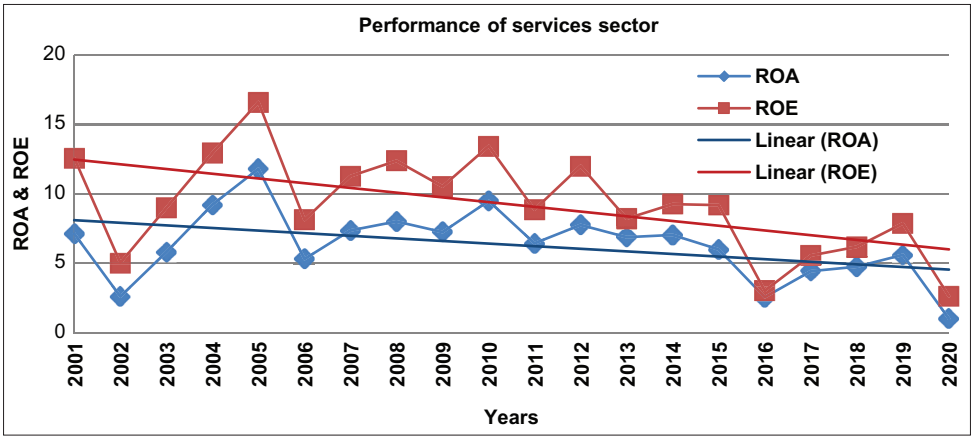
In an attempt to understand the behavior of the performance of Jordanian listed non-financial firms during the study period, the study has summarized the effects of GFC and COVID-19 pandemic on the profitability of two sectors in the Jordanian economy: (1) Services sector that includes telecommunications, transportation, tourism, commerce, healthcare and education, (2) Industrial sector involved in manufacturing, mining and quarrying. Figures 1 and 2 present the average of both ROA and ROE trends for the firms in the services and industrial sectors respectively. There was a noticeable improvement in profitability measures of both sectors during the period of 2002-2005 due to the significant improvement in trade openness (Jordan has become the 136th member of the World Trade Organization in 2000), the movement of Iraqi investors with their capital to Jordan leading to a boom in stock and real estate markets, in addition to the policies applied by Central Bank of Jordan (CBJ) that have aimed at restoring the stability of the exchange rate and lowering inflation rates (Adeinat, 2020). These figures also show that the profitability on average for both sectors has declined over years especially after the GFC of 2008; the linear trend lines in each figure are

Table 1: Variables definitions

Variable	Variable name	Variable definition	Expected sign
ROA	Return on assets	Net profit/ending balance on total assets	
ROE	Return on equity	Net profit/ending balance on owners' equity	
LA	Total assets logarithm	The size of an enterprise is measured by the logarithm of its total assets	±
DA	Debt to assets ratio	The total liabilities/total assets	−
INF	Inflation	Annual percentage change in consumer price index	±
CD	COVID-19 pandemic dummy variable	The dummy variable of "COVID-19 pandemic outbreak time" is 1 after the outbreak, or 0 otherwise	−
GD	GFC dummy variable	The dummy variable of "GFC" is 1 in 2008, 2009 and 2010, or 0 otherwise	−

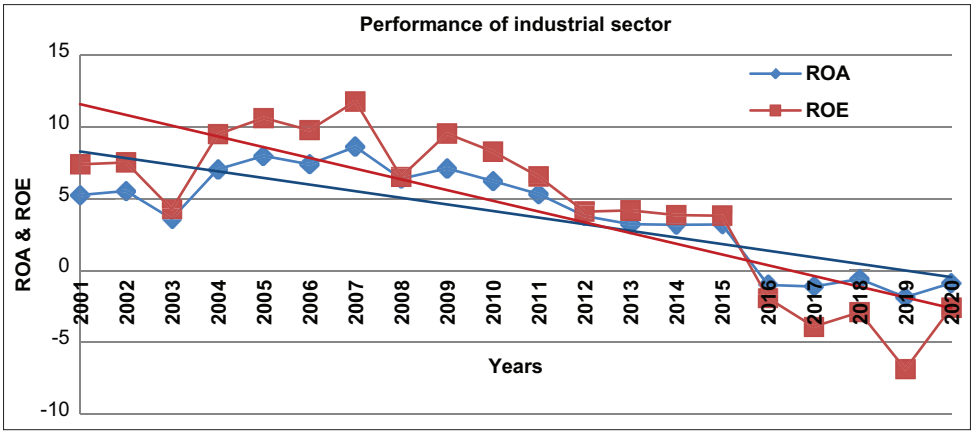
Source: Research finding. GFC: Global financial crisis, GD: GFC dummy variable

Figure 1: The Average of ROA & ROE for the Services Sector during the Study Period



Source: Research finding

Figure 2: The Average of ROA & ROE for the Industrial Sector during the Study Period



Source: Research finding.

negatively-sloped. The deteriorating performance of the Jordanian firms might be attributed to several factors such as; the wide-spread corruption, continuous increases in tax rates, excessive bureaucracy, regional turmoil, political instability, interruptions of Egyptian gas supplies to Jordan during 2013-2014 that enforced switching to overpriced alternative sources of energy, increasing inflows of refugees and lately COVID-19 pandemic. It is clear that both performance indices for services sector declined sharply in 2020 compared with their values in 2019, while these indices for industrial sector were slightly improved in 2020 compared with their values in 2019, indicating that services sector that includes tourism, healthcare …etc., is the most negatively affected by the pandemic according to the study sample. ROA & ROE of both sectors are mostly close to zero in 2020, as negatively affected by the implementation of strict quarantine measures that decreases the demand for (and supply of) goods and services. The profitability of services sector is highly volatile as shown in Figure 1, and this could be attributed to the high volatility of business risk and debt ratios in this sector (Gharaibeh and Bani Khaled, 2020).

4.2. Econometric Analysis

Multicollinearity is the existence of high inter-correlations among the independent variables, resulting in misleading outcomes or wrong statistical inferences. As seen in Table 2, multicollinearity

Table 2: Correlation matrix

	INF	LA	DA	ROA	ROE
INF	1	−0.0010	−0.0224	0.1179	0.1131
LA		1	0.2930	0.1582	0.2106
DA			1	−0.3282	−0.1938
ROA				1	0.9590
ROE					1

Source: Research finding. ROA: Return on assets, ROE: Return on equity, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio

problem is not actually existed since the correlation coefficients between the explanatory variables were found to be very low (not close to 1 or -1). It can be noticed that the correlation between debt ratio and both profitability indices is negative.

In order to avoid spurious relationship, the econometric analysis of the two models for the whole sample begins with the panel unit root test. The null hypothesis for such test is: panel data has a unit root. If the probability value is less than 5%, the null hypothesis will be rejected, meaning that the study variable is stationary at level, but if the probability value is more than 5%, the null hypothesis will not be rejected, indicating that the variable is not stationary at level. Table 3 presents the results of Levin, Lin & Chu panel unit root test for the study variables (except dummy ones) at both individual effects and individual effects with individual

linear trends levels. This table has revealed that all the variables have probability values less than 0.05, leading to the rejection of the null hypothesis and concluding that all study variables are stationary at level. Therefore, the appropriate method to estimate the study models is either fixed effect or random effect model based on Hausman test's results (Hausman, 1978). In the fixed effects model, the individual-specific effect is a random variable that is correlated with the explanatory variables, while in the random effects model, the individual-specific effect is a random variable that is uncorrelated with the explanatory variables (Greene, 2011). As shown in Table 4 that has displayed Hausman tests' results, the probability value of Chi-Squared statistic for both models is greater than 0.05, indicating the acceptance of the null hypothesis of such test (H_o: Random effects model is more efficient and appropriate to be applied than fixed effects), and concluding the absence of correlation between the unobserved individual effects and the explanatory variables.

Table 5 illustrates the results of random and fixed effect estimations for the first econometric model where ROA is the dependent variable. As illustrated in random effect model, the total asset (LA) has a significant positive effect on the profitability (ROA) of firms at 1% significance level which is consistent with the outcomes of (Lee, 2009; Surajit and Saxena, 2009; Bayyurt, 2007; Tangen, 2003). Whereas the debt ratio (DA) has the greatest significant negative impact on the firms' performance at 1% significance level; a 1% increase in debt ratio decreases ROA of the firms covered in this study by about 20%, which is consistent with the results of previous studies (Hamid et al., 2015; Alghusin, 2015; Azhagaiah and Gavoury, 2011). On the other hand, inflation (INF) has insignificant effect on the profitability of firms, which is consistent with the outcomes of some previous studies (Alper and Anbar, 2011; Sufian, 2012). Inflation is not often damaging for firms, since they can increase their prices to consumers in order to cover the costs of production. As explained by (Perry, 1992; Alper and Anbar, 2011), the positive or negative impact of inflation on profitability depends on whether inflation is anticipated or unanticipated; if inflation is anticipated, firms can properly adjust their prices in order to increase their revenues and maintain their profit margins. On the contrary, if inflation is unanticipated, firms may not make the proper adjustments of their prices, and costs may increase faster than revenues. It is obvious here that there is a significant negative impact of Coronavirus pandemic (CD) on the profitability of selected firms by about 4% at 5% significance level, while the insignificant impact of GFC (GD) on the profitability may be explained by the lack of deal or use of financial derivatives by such firms (Central Bank of Jordan, 2013). Moreover, the probability of F-statistic (0.0000) confirms the significance of this model and its goodness of fit. It is important to note that in panel data, R-squared is often low when compared to time-series data that has trend components (Victoria, 2013). R-squared value (0.21) in Table 5 means that 21% of variation in ROA is due to variation in the independent variables.

Table 3: Levin, Lin and chu panel unit root test

Variable	Individual effects		Individual effects and individual linear trends	
	Statistic value	Probability value	Statistic value	Probability value
ROA	−5.6406	0.0000	−5.5915	0.0000
ROE	−5.7345	0.0000	−5.0823	0.0000
LA	−3.0512	0.0011	−2.4991	0.0062
INF	−13.312	0.0000	−13.371	0.0000
DA	−3.6341	0.0001	−3.4766	0.0003

Source: Research finding. ROA: Return on assets, ROE: Return on equity, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio

Table 4: Results of hausman test

Test summary	Chi-square statistic	Chi-square d.f.	Probability
Cross-section random (1st equation)	0.0000	5	1.0000
Cross-section random (2nd equation)	0.0000	5	1.0000

Source: Research finding

In order to ensure robustness of the study outcomes, the estimations of fixed and random effects for the second econometric model where ROE is the dependent variable are presented in Table 6. In the random effect model, the assets (LA) and inflation (INF) have insignificant effects on the profitability (ROE) of firms. On the other hand, the debt ratio (DA) has the highest significant negative impact on the firms' performance at 1% significance level; a 1% increase in debt ratio decreases ROE of the firms covered in this study by about 27%. It is clear that there is a significant negative effect of Coronavirus pandemic (CD) on profitability of selected firms by about 6% at 5% significance level, while GFC (GD) has insignificant impact. In addition, the probability of F-statistic (0.0000) indicates that the second model is also statistically significant. R-squared value (0.14) means that 14% of variation in ROE is explained by variation in the independent variables. Based on the previous analysis, the hypotheses H_{01}, H_{03} and H_{04} are rejected. Furthermore, for more robustness of the study results, both models were re-estimated for each sector separately with results displayed in Tables 7-10, noting that the

Table 5: Results of fixed and random effect models (return on assets: Dependent variable. 400 observations)

Variable	Fixed effect model				Random effect model			
	Coefficient	SE	t-statistic	Probability	Coefficient	SE	t-statistic	Probability
C	0.1269	0.0989	1.2827	0.2004	−0.1946	0.0489	−3.9788	0.0001
LA	−0.0025	0.0129	−0.1919	0.8479	0.0389	0.0064	6.0334	0.0000
DA	−0.1824	0.0213	−8.5359	0.0000	−0.1970	0.0225	−8.7412	0.0000
INF	0.0706	0.0678	1.0399	0.2990	0.1801	0.1422	1.2664	0.2061
CD	−0.0344	0.0094	−3.6535	0.0003	−0.0432	0.0196	−2.1993	0.0284
GD	0.0093	0.0060	1.5496	0.1221	0.0161	0.0126	1.2820	0.2006
	R^2=0.58, F-statistic=21.6, Probability (F-statistic)=0.0000				R^2=0.21, F-statistic=20.2, Probability (F-statistic)=0.0000			

Source: Research finding. SE: Standard error, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio, CD: Coronavirus pandemic, GD: Global financial crisis dummy variable

Table 6: Results of fixed and random effect models: Dependent variable. 400 observations

Variable	Fixed effect model				Random effect model			
	Coefficient	SE	t-statistic	Probability	Coefficient	SE	t-statistic	Probability
C	0.2414	0.1781	1.3559	0.1759	0.0071	0.1488	0.0479	0.9618
LA	−0.0136	0.0231	−0.5883	0.5567	0.0179	0.0192	0.9296	0.3532
DA	−0.2250	0.0341	−6.5942	0.0000	−0.2688	0.0414	−6.4904	0.0000
INF	0.1522	0.1128	1.3487	0.1782	0.2244	0.1614	1.3901	0.1653
CD	−0.0579	0.0156	−3.7070	0.0002	−0.0561	0.0223	−2.5135	0.0124
GD	0.0179	0.0100	1.7848	0.0751	0.0261	0.0143	1.8235	0.0690
	R^2=0.54, *F*-statistic=18.1, Probability (*F*-statistic)=0.0000				R^2=0.14, *F*-statistic=12.2, Probability (*F*-statistic)=0.0000			

Source: Research finding. SE: Standard error, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio, CD: Coronavirus pandemic, GD: Global financial crisis dummy variable

Table 7: Results of fixed and random effect models for services sector (return on assets: Dependent variable)

Variable	Fixed effect model				Random effect model			
	Coefficient	SE	t-statistic	Probability	Coefficient	SE	t-statistic	Probability
C	0.0513	0.15490	0.3311	0.7410	−0.1286	0.06823	−1.88515	0.0609
LA	0.0086	0.02118	0.4052	0.6858	0.0339	0.00921	3.67539	0.0003
DA	−0.1693	0.04899	−3.4562	0.0007	−0.2149	0.02805	−7.6625	0.0000
INF	0.1326	0.07714	1.7192	0.0873	0.1467	0.14852	0.98776	0.3245
CD	−0.0381	0.01814	−2.0991	0.0372	−0.0541	0.02054	−2.63447	0.0091
GD	0.0194	0.01281	1.5128	0.1320	0.0194	0.01314	1.47313	0.1423
	R^2=0.68, *F*-statistic=27.5, Probability (*F*-statistic)=0.0000				R^2=0.18, *F*-statistic=7.9, Probability (*F*-statistic)=0.0000			

Hausman test: Chi-square statistic: 0.2131, Chi-square d.f.: 5, Probability: 0.999

Source: Research finding. SE: Standard error, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio, CD: Coronavirus pandemic, GD: Global financial crisis dummy variable

Table 8: Results of fixed and Random effect models for services sector (return on equity: Dependent variable)

Variable	Fixed effect model				Random effect model			
	Coefficient	SE	*t*-statistic	Probability	Coefficient	SE	*t*-statistic	Probability
C	0.2750	0.24749	1.11123	0.2679	−0.2053	0.11341	−1.80970	0.0719
LA	−0.0174	0.03241	−0.53893	0.5906	0.0446	0.01548	2.88276	0.0044
DA	−0.1556	0.07179	−2.16661	0.0315	−0.1611	0.05093	−3.1632	0.0018
INF	0.2124	0.22033	0.96386	0.3364	0.2296	0.30053	0.76401	0.4458
CD	−0.0586	0.0291	−2.0137	0.0450	−0.0648	0.02573	−2.5167	0.0127
GD	0.0285	0.01967	1.4512	0.1484	0.0251	0.02778	0.90418	0.3670
	R^2=0.53, *F*-statistic=14.9, Probability (*F*-statistic)=0.0000				R^2=0.09, *F*-statistic=3.49, Probability (*F*-statistic)=0.0048			

Hausman test: Chi-square statistic: 1.4016, Chi-square d.f.: 2, Probability: 0.4962

Source: Research finding. SE: Standard error, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio, CD: Coronavirus pandemic, GD: Global financial crisis dummy variable

Table 9: Results of fixed and random effect models for industrial sector (return on assets: Dependent variable)

Variable	Fixed effect model				Random effect model			
	Coefficient	SE	*t*-statistic	Probability	Coefficient	SE	*t*-statistic	Probability
C	−0.0323	0.16877	−0.1913	0.8485	−0.2001	0.09822	−2.0372	0.0430
LA	0.0184	0.02187	0.8395	0.4023	0.0393	0.01378	2.85284	0.0048
DA	−0.1964	0.03095	−6.3453	0.0000	−0.1918	0.02845	−6.7428	0.0000
INF	−0.1107	0.09811	−1.1283	0.2607	−0.0205	0.11019	−0.1860	0.8527
CD	−0.0289	0.0052	−5.5934	0.0000	−0.0255	0.00630	−4.0542	0.0001
GD	−0.0043	0.0068	−0.6253	0.5325	0.0089	0.00622	1.4444	0.1502
	R^2=0.45, *F*-statistic=10.9, Probability (*F*-statistic)=0.0000				R^2=0.36, *F*-statistic=21.1, Probability (*F*-statistic)=0.0000			

Hausman test: Chi-square statistic: 0.0000, Chi-square d.f.: 5, Probablity: 1.0000

Source: Research finding. SE: Standard error, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio, CD: Coronavirus pandemic, GD: Global financial crisis dummy variable

results of estimation for each sector are consistent with that for the whole sample.

5. CONCLUSIONS AND RECOMMENDATIONS

The main purpose of this study is to investigate the relative impact of Covid-19 pandemic and GFC on the performance of Jordanian listed non-financial firms. To achieve this purpose, the study has used panel data for twenty firms over the period 2001-2020 obtained from Amman Stock Exchange database. All the variables of the study were found to be stationary at level, thus, fixed and random effect models were applied to estimate two econometric equations that employed two performance indices (ROA and ROE). The results have revealed that firm size has a significant positive effect on the profitability of selected Jordanian firms, concluding that big firms can produce items on much lower costs when compared to small firms, and reflecting the concept

Table 10: Results of fixed and random effect models for industrial sector (return on equity: Dependent variable)

Variable	Fixed effect model				Random effect model			
	Coefficient	SE	*t*-statistic	Probability	Coefficient	SE	*t*-statistic	Probability
C	0.3668	0.48705	0.75304	0.4524	−0.3163	0.14436	−2.19121	0.0296
LA	−0.0267	0.06312	−0.42222	0.6734	0.0673	0.02422	2.78264	0.0059
DA	−0.3659	0.06715	−5.44855	0.0000	−0.4109	0.12425	−3.30679	0.0011
INF	−0.2336	0.20795	−1.12346	0.2627	−0.8316	0.39927	−2.0827	0.0386
CD	−0.0567	0.01080	−5.24577	0.0000	−0.0624	0.01422	−4.3897	0.0000
GD	−0.0132	0.01304	−1.01205	0.3128	−0.0448	0.03002	−1.4920	0.1373
	R^2=0.37, *F*-statistic=7.7, Probability (*F*-statistic)=0.0000				R^2=0.32, *F*-statistic=18.2, Probability (*F*-statistic)=0.0000			

Hausman test: Chi-square statistic: 0.0000, Chi-square d.f.: 5, Probability: 1.0000

Source: Research finding. SE: Standard error, INF: Inflation, LA: Total assets logarithm, DA: Debt to assets ratio, CD: Coronavirus pandemic, GD: Global financial crisis dummy variable

of economies of scale. The estimations have also brought to light the significant negative impact of debt on the performance of Jordanian firms, deducing that paying debt charges could impede benefiting from some investment opportunities and deprive such firms of profits. With respect to the insignificant effect of inflation on profitability, it could be concluded that selected Jordanian firms can properly predict inflation and adjust their prices to maintain their profit margins. The outcomes also demonstrate the substantial negative impact of Covid-19 pandemic on the profitability of selected Jordanian firms, which overwhelms that of GFC.

In order to mitigate the social and economic consequences of Covid-19 pandemic and attenuate its adverse effects on the performance of Jordanian firms, the study recommends the followings:

1. The government should develop a real program with transparent approach to support prioritization of enterprises to be equipped.
2. Technical and mentoring assistance should be provided to businesses in order to develop or improve their appropriate continuity plans and model adjustments, and help them to face the status quo.
3. Digital and technological transformation process that requires cultural and organizational transformation should be supported and accelerated.
4. Providing incentives for Jordanian firms to invest in more resource-efficient business processes, and supporting local procurement are needed. It is also important to encourage innovations and eliminate all bureaucratic impediments to implementation of good ideas that add value to Jordanian firms, in order to strengthen their financial positions and improve their performance.
5. Reducing, rescheduling or even waiving tax payments, and facilitating access to fund and services for firms in need of support, i.e.; prioritizing support (tax reduction, grants, or soft loans) to the most vulnerable firms; such as SMEs, in order to ensure job retention and enterprises continuity.
6. Financing the investment projects by firms' retained earnings and allowing a small proportion of debt to be existed in the capital structure.

REFERENCES

Adeinat, M. (2020), A Reading of the History and Current State of the Jordanian Economy. Amman, Jordan: Dar Wael for Publishing and Distribution.

Alghusin, N. (2015), Do financial leverage, growth and size affect profitability of jordanian industrial firms listed? International Journal of Academic Research in Business and Social Sciences, 5(4), 335-348.

Alnajjar, F., Noor, M., Al-ahmad, N., Issa, S. (2010), The Global Financial Crisis and its Impact on the Financial Sector in Jordan: Applied Study on Companies Listed on the Amman Stock Exchange. Available from: https://www.uop.edu.jo/download/Research/members/285_1968_Faye.pdf

Alper, D., Anbar, A. (2011), Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. Business and Economics Research Journal, 2(2), 139-152.

Azhagaiah, R., Gavoury, C. (2011), The impact of capital structure on profitability with special reference to IT industry in India. Managing Global Transitions, 9(4), 371-392.

Bayyurt, N. (2007), İşletmelerde Performans değerlendirmenin önemi ve performans göstergeleri arasindaki ilişkiler. Sosyal Siyaset Konferansları Dergisi, Sayı, 53, 577-592.

Central Bank of Jordan. (2013), Financial Stability Report. Available from: https://www.cbj.gov.jo/Pages/viewpage.aspx?pageID=215

Central Bank of Jordan. (2021), Yearly Statistical Series. Available from: http://www.cbj.gov.jo/pages.php

De Castro, L.M., Dhillon, G., Card˜ao-Pito, T., Crathorne, M., Lisboa, I. (2017), Capital structure of exporter SMEs during the financial crisis: Evidence from Portugal. European Journal of Management Studies, 22(1), 25-49.

Dias, A.L., Carlos Manuel, E., Dutschke, G., Pereira, R., Pereira, L. (2021), Economic crisis effects on SME dynamic capabilities. International Journal of Learning and Change, 13(1), 63-80.

Dogan, M. (2013), Does firm size affect the firm profitability? Evidence from Turkey. Research Journal of Finance and Accounting, 4(4), 53-59.

Duarte, F.D., Gama, A.P.M., Gulamhussen, M.A. (2018), Defaults in bank loans to SMEs during the financial crisis. Small Business Economics, 51(3), 1-18.

Fernandes, N. (2020), Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy. Available from: https://www.ssrn.com/abstract=3557504

Fu, M., Shen, H. (2020), COVID-19 and Corporate Performance in the Energy Industry. Energy Research Letters, 1(1), 12967.

Gharaibeh, O., Bani Khaled, M. (2020), Determinants of profitability in Jordanian services companies. Investment Management and Financial Innovations, 17(1), 277-290.

Gill, A., Biger, N., Pai, C., Bhutani, S. (2009), The determinants of capital structure in the service industry: Evidence from United States. The Open Business Journal, 2(1), 48-53.

Greene, W.H. (2011), Econometric Analysis. 7th ed. New Jersey: Prentice Hall.

Hagerty, S.L., Williams, L.M. (2020), The impact of COVID-19 on mental

health: The interactive roles of brain biotypes and human connection. Brain, Behavior, and Immunity Health, 5, 100078.
Hamid, M.A., Abdullah, A., Kamaruzzaman, N.A. (2015), Capital structure and profitability in family and non-family firms: Malaysian evidence. Procedia Economics and Finance, 31, 44-55.
Hausman, J.A. (1978), Specification tests in econometrics. Econometrica, 46(6), 1251-1271.
Hofer, C.W. (1980), Turnaround strategies. Journal of Business Strategy, 1(1), 19-31.
Jordà, Ò., Singh, S.R., Taylor, A.M. (2020), Longer-Run Economic Consequences of Pandemics. Technical Report. United States: NBER Working Paper No. 26934.
Kanwal, S., Nadeem, M. (2013), The impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan. European Journal of Business and Social Sciences, 2(9), 186-201.
Kebede, T., Stave, S., Kattaa, M., Prokop, M. (2020), Impact of the COVID-19 Pandemic on Enterprises in Jordan. ILO, Fafo, and UNDP. Available from: https://www.ilo.org/wcmsp5/groups/public/---arabstates/---robeirut/documents/publication/wcms_749136.pdf
Kouser, R., Bano, T., Azeem, M., Ul-Hassan, M. (2012), Inter-relationship between profitability, growth and size: A case of non-financial companies from Pakistan. Pakistan Journal of Commerce and Social Sciences, 6(2), 405-419.
Lee, J. (2009), Does size matter in firm performance? Evidence from U.S public firms. International Journal of the Economics of Business, 16(2), 189-203.
Naceur, S.B. (2003), The Determinants of the Tunisian Banking Industry Profitability: Panel Evidence. Universite Libre de Tunis Working Papers. Available from: https://www.file:///C:/Users/USER/Downloads/The_determinants_of_the_Tunisian_banking_industry_.pdf
Nguyen, H.H., Ngo, V.M., Tram, A., Trans, N. (2021), Financial performances, entrepreneurial factors and coping strategy to survive in the COVID-19 pandemic: Case of Vietnam. Research in International Business and Finance, 56, 101380.
Odusanya, I.A., Yinusa, O.G., Ilo, B.M. (2018), Determinants of firm profitability in Nigeria: Evidence from dynamic panel models. SPOUDAI Journal of Economics and Business, 68(1), 43-58.
Oyelade, A. (2019), The impact of firm size on firm performance in Nigeria: A comparative study of selected firms in the building industry in Nigeria. Asian Development Policy Review, 7(1), 1-11.
Perry, P. (1992), Do banks gain or lose from inflation. Journal of Retail Banking, 14(2), 25-30.
Rababah, A., Al-Haddad, L., Sial, M.S., Cherian, J. (2020), Analyzing the effects of COVID-19 pandemic on the financial performance of Chinese listed companies. Journal of Public Affairs, 20(1), 1-6.
Shen, H., Fu, M., Pan, H., Yu, Z., Chen, Y. (2020), The impact of the COVID-19 pandemic on firm performance. Emerging Markets Finance and Trade, 56(10), 2213-2230.
Sufian, F. (2012), Determinants of bank profitability in developing economies: Empirical evidence from the South Asian banking sectors. Contemporary South Asia, 20(3), 375-399.
Surajit, B., Saxena, A. (2009), Does the Firm Size Matter? An Empirical Enquiry into the Performance of Indian Manufacturing Firms. Available from: http://www.ssrn.com/abstract=1300293
Tangen, S. (2003), An overview of frequently used performance measures. International Journal of Productivity and performance management, 52(7), 347-354.
United Nations Conference on Trade and Development. (2020), Impact of the COVID-19 Pandemic on Global FDI and GVCs: Updated Analysis. Investment Trends Monitor Special Issue. Available from: https://www.unctad.org/en/PublicationsLibrary/diaeiainf2020d3_en.pdf
Victoria, B.C. (2013), Good Old R-Squared! Econometrics Beat: Dave Giles Blog. Available from: http://www.davegiles.blogspot.com/2013/05/good-old-r-squared.html
Zeng, M., Zhang, P., Yu, S., Zhang, G. (2016), Decision-making model of generation technology under uncertainty based on real option theory. Energy Conversion and Management, 110, 59-66.
Zubair, S., Kabir, R., Huang, X. (2020), Does the financial crisis change the effect of financing on investment? Evidence from Private SMEs. Journal of Business Research, 110, 456-463.