**The Relationship Between Solvency Ratios and Profitability Ratios**

**"Analytical Study in Food Industrial Companies listed in Amman Bursa"**

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**Abstract**

This study aims to examine the relationship between solvency ratios and profitability ratios. The study was conducted on the food industrial companies listed in Amman Bursa during the period (2012-2014). The results revealed no relationship between the following solvency ratios (debt/asset ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and the following profitability ratios (gross profit margin and operating cash flow margin). The results show negative relationship between both ratios of solvency (debt/asset ratio, debt/equity ratio) and the following profitability ratios (operating profit margin, net profit margin and return on assets). There are no relationships between the remaining of the solvency ratios (long-term debt ratios/ assets, long-term debt ratios/equity, and interest coverage) and the following profitability ratios (operating profit margin, net profit margin, and return on assets).

**Key words: Solvency Ratios, Profitability Ratios, Food Industrial Companies, Amman, Jordan**

**Introduction:**

Solvency refers to the company's ability to meet its obligations in the long term. It means the company's ability to pay its obligations in the long-term including interest and principal debt. In other words, it represents the financial structure of the company (Robinson et al., 2015). Solvency ratios provide a general description of the debts in the company's capital structure, as well as the ability of cash flows to cover interest expenses and fixed costs such as rent payments and leases. Assets are typically fund from two sources, internal and external, including many items such as ordinary shares, preference shares, reserves, bonds and bank loans, securities convertible into loans, and short-term liabilities such as overdrafts and accounts payable (Tze, OS, & Heng, BT, 2011; Gitman, L., 2006).

Financial structure is an important tool by which to identify the risks level that surround the company. Fixed costs are the most important factor that reflect on the performance and profitability of the company both in terms of the production process or financing costs. This refers to the need to work to reduce this type of costs, especially financing costs which will reflect in the reduction of total costs, and thus to improve the profitability (Hasan, et al., 2014, Robinson et al., 2015).

Financing of the company's assets through issuing ordinary shares or by holding a percentage of profits can contribute in reducing loans, which will reflect the financing costs and thus profitability. Corporate administration seeks to ongoing calibration between debt and equity, so that the companies operate to maintain the financial structure which include an equity amount bigger than debts. This financial structure helps in maintain the financial independence of the company and reduce risks, as well as reduce financing costs and improve profitability (Tze, OS, & heng, BT, 2011; Gitman, L., 2006).

This study measures the following solvency ratios (debt/assets ratio, debt/ equity ratio, long-term debt/assets, long-term debt/equity ratio, and interest coverage) and the following profitability ratios (gross profit margin, operating profit margin, net profit margin, operating cash flow margin, and return on assets).

**Research problem:**

Many studies and researches have shown that there is a close relationship between solvency ratios and profitability ratios (Tze, OS, & Heng, BT, 2011; Gitman, L., 2006). Accordingly, research problem can be determining in that the adoption of inadequate financial structure could reflect negatively on the profitability of the company because of increase fixed charges. Accordingly, the researcher believes that to determine the factors that can play a major role in improving or declining the profitability of companies, it is imperative to answer the many inquiries that link to this subject by asking the following questions:

1. What is the relationship between solvency ratios and gross profit margin?  
2. What is the relationship between solvency ratios and operating profit margin?  
3. What is the relationship between solvency ratios and net profit margin?  
4. What is the relationship between solvency ratios and operating cash flow margin?  
5. What is the relationship between solvency ratios and return on assets?

**Research objectives:**

The objectives of this study are:

1. Identification of solvency ratios in the studied food industrial companies.  
2. Determine the profitability ratios in the studied food industry companies.  
3. Study the relationship between solvency ratios and profitability ratios.  
4. Provide sets of recommendations and proposals that will work to increase the rates of profitability and solvency ratios in the studied food industry companies.

**Importance of research:**

The importance of this study emerges from the importance of the subject studied. This study may help relevant parties to analyze the reality of these companies in a better way by identifying the significant factors that affect the corporate profitability, which may help these companies to take appropriate administrative decisions relating to solvency and profitability.

**Procedural definitions:**

Procedural variables of the study have been defined as follows:

1. **Solvency ratios**: solvency refers to the company's ability to meet its obligations with respect to long-term debt. In other words, solvency reflects the company's ability to repay long-term obligations including principal payments and its benefits (Robinson, et. Al., 2015).
2. **Profitability ratios**: Profitability refers to the company's ability to generate profits as a return on the funds invested. Profitability ratios reflect the competitive situation of the company in addition to the quality of management. The ratios reflect the success or failure of the company (Robinson, et. Al., 2015).

**The study model:**

Figure (1) illustrates the default relationships between the study variables which have been built based on series of previous studies in this area with some appropriate adjustments (Hasan, et al., 2014; Tze, OS, & Heng, BT, 2011; Gitman, L., 2006). On this basis, five ratios have been adopted for solvency (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage). Also, five ratios have been adopted for profitability (gross profit margin, operating profit margin, net profit margin, operating cash flow margin, and return on assets).

**Figure 1. Relations among variables**

**Dependent**

**Variable**

**Independent**

**Variables**

**Operating profit margin**

**Profitability**

**Ratios**

**Net profit margin**

**Operating cash flow margin**

**Gross profit margin**

**Return on assets**

**Solvency Ratios**

**Debt-to-equity ratio**

**Long-term debt-to-assets**

**ratio**

**Long-term debt-to-equity ratio**

**Interest coverage**

**Debt-to-assets ratio**

**Dependent**

**Variable**

**Independent**

**Variables**

OPM

**Profitability**

NPM

OCFM

GPM

ROA

**Solvency ratios**

LTDAR

DER

LTDER

IC

DAR

**Dependent**

**Variable**

**Independent**

**Variables**

OPM

**Profitability**

NPM

OCFM

GPM

ROA

**Solvency ratios**

LTDAR

DER

LTDER

IC

DAR

**Research hypotheses:**

Per the previous data, the following main hypothesis can be formulated:

There is no significant relationship at the level of significance (α ≤ 0.05) between solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and profitability ratios (gross profit margin, operating profit margin, net profit margin, operating cash flow margin, and return on assets). From this hypothesis, the following sub-hypotheses are emerged:

1. There is no significant relationship at the level of significance (α ≤ 0.05) between solvency ratios and gross profit margin.
2. There is no significant relationship at the level of significance (α ≤ 0.05) between solvency ratios and operating profit margin.
3. There is no significant relationship at the level of significance (α ≤ 0.05) between solvency ratios and net profit margin.
4. There is no significant relationship at the level of significance (α ≤ 0.05) between solvency ratios and operating cash flow margin.
5. There is no significant relationship at the level of significance (α ≤ 0.05) between solvency ratios and return on assets.

**The theoretical framework and previous studies:**

**Solvency ratios:**

1. **Debt-to-assets ratio**: it measures the percentage of total debts used in the capital structure. The higher the percentage of this ratio, the greater financial risk (Robinson et al., 2015).

2. **Debt-to-equity ratio**: this ratio refers to the total debts attributed to shareholders' equity (net assets). Rising this ratio up to one refers to a weak financial solvency and loss of control by the company (Sinha, 2012).

3. **Long-term debt-to-assets ratio**: it refers to the long-term debt relative to assets. Rising this ratio means increasing reliance on external financing and thus increase interests and declining profitability (Gibson, 2009).

4. **Long-term debt-to-equity ratio**: it refers to the relationship between long-term debt and equity. Declining this ratio below one means that the firm's financial position is better, and if more than one, it means that the long-term debt is greater than equity, and the company will face a dangerous situation. The best situation when this ratio is not more than 50% (Sinha, 2012).

5. **Interest coverage**: This ratio refers to the number of times that net profit before interest and taxes related to a company can cover interest payments (Robinson, et. Al., 2015).

**Profitability ratios:**

1. **Gross Profit Margin**: This ratio refers to the sales' ability to generate gross profit. The high ratio refers to high selling prices and low production costs. The high selling prices mean that the company's products have a competitive advantage. If a product has a competitive advantage either from cost or quality, then this will help a company to increase profitability (Robinson, et. Al., 2015).

**2.** **Operating Profit Margin**: operating profit can be obtained through operating costs deducted from gross profit. This is a very important ratio because it reflects the company's ability to generate profit from ordinary operations related to a company. The decline in this ratio refers to a weak control over operating costs (Gibson, 2009).

**3. Net Profit Margin**: This ratio includes the operating profit plus extraordinary revenue (Non-Recurring) and minus extraordinary expenses (Robinson, et. Al., 2015).

**4. Operating Cash Flow Margin**: The ratio measures the cash generated by the regular company's operations per unit in cash from sales. Cash flows can be found from the statement of cash flows, while revenue from the income statement. The rise in this ratio could refers that the company takes effective policies to turn sales into cash, and may also refer to a high quality of profits (Sinha, 2012).

**5. Return on Assets**: It refers to a relationship between net profit and assets. The rise in the ratio refers to an effectiveness of the employment of assets by the company (Robinson, et. Al., 2015).

**Ratios of study' variables:**

Table (1) shows how to calculate each ratio of solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and how to calculate each ratio of profitability ratios (gross profit margin, operating profit margin, net profit margin, operating cash flow margin, and return on assets).

**Table (1) Solvency Ratios & Profitability Ratios**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Full name** | **Measure** |
| **Dependent**  **(Profitability ratios)** |  |  |
| GPM | Gross profit margin | Gross profit / Revenue |
| OPM | Operating profit margin | Operating income / Revenue |
| NPM | Net profit margin | Net income / Revenue |
| OCFM | Operating cash flow margin | Cash flows from operating activities / Revenue |
| ROA | Return on assets | Net income / Average total assets |
| **Independent**  **(Solvency ratios)** |  |  |
| D/AR | Debt-to-assets ratio | Total debt / Total assets |
| D/ER | Debt-to-equity ratio | Total debt / Total shareholders' equity |
| LTD/AR | Long-term debt-to-assets ratio | Long-term debt / Total assets |
| LTD/ER | Long-term debt-to-equity ratio | Long-term debt / Total equity |
| IC | Interest coverage | Earnings before interest & tax / Interest payments |

Resource: (Robinson et al., 2015; Sinha, 2012; Gibson, 2009; Mohammed, et al., 2008)

**Literature review:**

Many previous studies confirmed the presence or absence of moral relations between solvency ratios or financial structure ratios and profitability ratios with a different degree of each other. The purpose of this study (Hasan, et al., 2014) is to investigate the impact of the financial structure ratios on the financial performance of companies. The study conducts on a sample of 36 companies listed Dhaka Bursa in Bangladesh, during the period (2007-2012). It uses four ratios for financial performance (earnings per share, return on equity, return on assets, and Tobin's Q) as dependent variables. It uses three ratios of financial structure (short-term debt, long-term debt and total debt) as independent variables. The results show that earnings per share positively affected by short-term debt, while negatively affected by long-term debt. There was also a statistically significant negative relationship between return on assets and financial structure. On the other hand, there is no statistically significant relationship between financial structure and performance of the company as measured by return on equity, and thus, the financial structure ratios have a negative impact on the financial performance of the company.

The study (Mohamed M. Khalifa Tailab, 2014) aims to show the impact of capital structure on financial performance. It uses return on assets and return on equity as dependent variables, while it uses short-term debt, long-term debt, and total debts attributable to shareholders' equity as independent variables. The study sample included 30 US energy company for nine years starting in 2005. The results indicate that total debt has a significant negative impact on the return on equity and return on assets, while the volume of sales has a significant negative impact on the return on equity only in America corporates. Also, short-term debt has a positive effect on the return on equity.

The study (AM Goyal, 2013) aims to explore the effect of financial structure ratios on the profitability ratios related to public sector banks in India listed in national Bursa during the period (2008-2012). The results show a positive relationship between short-term debt and profitability ratios (return on equity, return on assets, and earnings per share).

While the study (Nirajini, A. and Priya, KB, 2013) aims to analyze the relationship between capital structure and financial performance during the period (2006-2010) for the commercial companies listed Sri Lanka Bursa. The results show a positive relationship between capital structure and financial performance. The results also show that the capital structure affect significantly on the company' financial performance, where the results show that the debt/assets ratio, debt/Equity ratio have a strong relationship with gross profit margin (GPM), net profit margin (NPM), return on capital employed (ROCE), return on assets (ROA) and return on equity (ROE).

The study (Ebrati et al., 2013) aims to analyze the impact of capital structure on the company's performance. The study uses number profitability ratios as dependent variables and number of capital structure ratios as independent variables. The results show that the return on assets and earnings per share associate negatively with the capital structure.

The study (Saedi and Mahmoodi, 2011) aims to analyze the relationship between capital structure and financial performance of a sample of 320 companies listed in Tehran Bursa during the period (2002 – 2009). The study uses four ratios for performance (return on assets, return on equity, earnings per share, and Q Tobin) as dependent variables, and three ratios for financial structure (short-term debt, long-term debt, and total debts) as independent variables. The study indicates the presence of a positive relationship between (earnings per share and Tobin's Q) and the capital structure, while the results show a negative relationship between capital structure and return on assets, and the lack of a statistically significant relationship between return on equity and capital structure.

**What distinguishes the current study from previous studies?**

What distinguishes this study from its predecessors that it is trying to detect the relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and the following profitability ratios (gross profit margin, operating profit margin, net profit margin, operating cash flow margin, and return on assets) in food industrial companies. This study fills this gap. What distinguishes this study, it also addresses the study of interest coverage and its relationship to the profitability ratios, which is a modern concept, which may raise the attention of many researchers in this field.

**The methodology:**

This study adopts the analytical descriptive method which includes the composition of the theoretical framework through access to references and sources related to the subject of solvency and profitability. In addition to collect data and testing of hypotheses, by analyzing data related to food industrial companies listed in Amman Bursa, and detection of relations between the variables of the study and the various dimensions and interpretative them, to identify the factors that control profitably for companies studied, and access to conclusions contribute to improve and develop the position.

**The study population and appointment:**

The study population consists of all food industrial companies listed in Amman Bursa during the period (2012- 2014), which are (11) companies. The study sample was selected (8) companies as described in Table (1), and excluding (3) companies because their data are not completed.

**Table (2) Company names and their symbols**

|  |  |  |
| --- | --- | --- |
| **No.** | **Company** | **Name of the company** |
| 1 | NATP | National Poultry Company |
| 2 | NDAR | Nutrydar Company |
| 3 | JVOI | Jordan Vegetable Oil Industries Co. Ltd. |
| 4 | SNRA | Siniora Food Industries |
| 5 | JPPC | J[ordan Poultry Processing and Marketing Co Ltd](http://static.mubasher.info/File.Mix_Announcement_File/38EAB168-8654-4EB7-BE10-4F69308B72C1.pdf) |
| 6 | JODA | Jordan Dairy Company Ltd. |
| 7 | GENI | General Investment Co. Ltd. |
| 8 | UMIC | Universal Modern Industries Co. for Edible Oil |

**Statistical analysis methods:**

Statistical Package for Social Sciences (SPSS) has been used to answer study questions and test their hypotheses using the following statistical methods:

1. Averages to identify the presence for each variable.

2. Standard deviations to know dispersion for each variable.

3. Simple Pearson correlation coefficient to test the hypotheses of the study.

**The study limits:**

1. Spacing limits: they are the food industrial companies listed in Amman Bursa within the period (2012 – 2014).

2. Timing limits: the period for doing this study is in 2015.

3. Statistical limits: It is by using of the level of confidence (95%) in testing the validity of hypotheses.

**Results and discussion:**

**Descriptive statistics for solvency ratios:**

Arithmetic means and standard deviations have been calculated for solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, and long-term debt/equity ratio) to identify the solvency rate during the three years in addition to the average solvency rate for food industrial companies listed Amman Bursa during the period (2012-2014), as illustrate in table (3):

**Table (3) Descriptive Statistics for Solvency Ratios**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S | Company | Solvency | | | Mean of Solvency | Company Importance |
| 2012 | 2013 | 2014 |
| 1 | NATP | 0.188 | 0.155 | 0.078 | 0.140 | 5 |
| 2 | NDAR | 0.402 | 1.600 | 1.033 | 1.012 | 2 |
| 3 | JVOI | 0.298 | 0.160 | 0.075 | 0.178 | 4 |
| 4 | SNRA | 0.515 | 0.465 | 0.335 | 0.438 | 3 |
| 5 | JPPC | 1.818 | 1.503 | 1.588 | 1.636 | 1 |
| 6 | JODA | 0.133 | 0.135 | 0.140 | 0.136 | 6 |
| 7 | GENI | 0.053 | 0.042 | 0.048 | 0.048 | 8 |
| 8 | UMIC | 0.057 | 0.042 | 0.100 | 0.067 | 7 |
| Mean of the year  Solvency | | 0.432 | 0.512 | 0.424 | 0.456 | - |
| Standard  Deviation | | 0.582 | 0.654 | 0.574 | 0.573 | - |

Table (3) shows the following:

- The solvency ratios rates for the companies studied are between (0.048 & 1.636) at a general solvency rate of (0.456) and standard deviation of (0.573), where the company (GENI) is a minimum rate while the company (JPPC) is the highest rate.

- In 2012, solvency rate is (0.053) as a minimum rate for the company (GENI) and (1.818) as a maximum rate for the company (JPPC), and at a general rate of (0.4320).

- In 2013, solvency rate is (0.042) as a minimum for companies (GENI & UMIC) and (1.600) as a maximum for company (NDAR), and at a general rate of (0.512).

- In 2014, solvency rate is (0.048) as a minimum for the company (GENI) and (1.588) as a maximum for company (JPPC), and at a general rate of (0.424).

- Note that the solvency rate fluctuates from year to year. In 2012, it is (0.4320) and then in 2013 it rises to (0.512) and in 2014, it returns to (0.424).

**Descriptive statistics for profitability ratios:**

The averages and standard deviations have been calculated for the following profitability ratios (gross profit margin, operating profit margin, net profit margin, and operating cash flow margin) to identify the profitability rate during the three years in addition to the average of profitability rate in food industrial companies listed Amman Bursa during the period (2012-2014), as illustrate in table (4):

**Table (4) Descriptive Statistics for Profitability ratios**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S | Company | Profitability | | | Mean of Profitability | Company Importance |
| 2012 | 2013 | 2014 |
| 1 | NATP | 0.020 | 0.035 | 0.033 | 0.029 | 7 |
| 2 | NDAR | 0.113- | 0.088- | 0.045 | 0.052- | 8 |
| 3 | JVOI | 0.073 | 0.193 | 0.178 | 0.148 | 3 |
| 4 | SNRA | 0.178 | 0.153 | 0.198 | 0.176 | 2 |
| 5 | JPPC | 0.065 | 0.003- | 0.043 | 0.035 | 6 |
| 6 | JODA | 0.083 | 0.095 | 0.093 | 0.090 | 4 |
| 7 | GENI | 0.193 | 0.240 | 0.215 | 0.216 | 1 |
| 8 | UMIC | 0.075 | 0.043 | 0.055 | 0.057 | 5 |
| for year Mean of Profitability | | .0710 | .0830 | .1070 | .0870 | - |
| Standard  Deviation | | .0940 | .1080 | .0760 | .0880 | - |

Table (4) shows the following:

- The profitability rates for the companies studied are between (& 0.052- 0.216) at a general profitability rate of (0.0870) and standard deviation of (0.0880), where the company (NDAR) has the lowest profitability, while the company (GENI) has the highest profitability.

- In 2012, profitability rate is (0.113-) as a minimum rate for the company (NDAR), and (0.193) as a maximum rate for the company (GENI), and a general rate of profitability of (0.0540) and a standard deviation of (0.0940).

- In 2013, profitability rate is (0.088-) as a minimum rate for the company (NDAR), and (0.240) as a maximum rate for the company (GENI), and a general rate of profitability of (0.0830) and a standard deviation of (0.1080).

- In 2014, profitability rate is (0.033) as a minimum rate for the company (NATP), and (0.215) as a maximum rate for the company (GENI), and a general rate of profitability of (0.1070) and a standard deviation of (0.0760).

- Note that the profitability rate in the companies studied is growing from year to year. in 2012, profitability rate is (0.071) and in 2013, it rises to (0.0830), and in 2014, also it rises to (0.107).

**Test hypotheses:**

To test the hypotheses of the study, simple correlation coefficient for Pearson was calculated between the independent variables of the study and each dependent variable as follows:

**Test the first hypothesis**: There is no statistically significant relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and gross profit margin.

**Table (5) The Results of Pearson Correlation between the Solvency and GPM**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | DAR | DER | LDAR | LDER | IC |
| GPM | R | -.163 | -.018 | -.284 | -.370 | -.328 |
| Sig | .700 | .966 | .496 | .367 | .427 |

Table (5) shows the following:

- There is no relationship between any of the five solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and gross profit margin as one of the dimensions of profitability, where the level of significance between each two variables is more than (0.05).

- Thus we accept the first null hypothesis which states that "there is no relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and gross profit margin".

**Test the second hypothesis**: There is no statistically significant relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and operating profit margin.

**Table (6) The Results of Pearson Correlation between the Solvency and OPM**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | DAR | DER | LDAR | LDER | IC |
| OPM | R | -.722 | -.796 | -.329 | -.512 | .004 |
| Sig | .043 | .018 | .426 | .195 | .993 |

Table (6) shows the following:

- There is a negative relationship between debt/asset ratio and operating profit margin, where the correlation coefficient reaches (-.722) and by a level of significance (.043).

- There is a negative relationship between debt/equity ratio and operating profit margin, where the correlation coefficient reaches (-.796) and a level of significance (.018).

- There is no relationship between the following solvency ratios (long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and operating profit margin as one of the dimensions of profitability, where the level of significance between each two variables is more than (0.05).

- We accept the second null hypothesis partly with respect to ratios (long-term debt/ assets ratio, long-term debt/equity ratio, and interest coverage) and its refusal partly also with respect to the following ratios (debt/assets ratio and debt/equity ratio).

**Test the third hypothesis**: There is no statistically significant relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and net profit margin.

**Table (7) The Results of Pearson Correlation between the Solvency and NPM**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | DAR | DER | LDAR | LDER | IC |
| NPM | R | -.760 | -.886 | -.273 | -.447 | .079 |
| Sig | .029 | .003 | .514 | .267 | .853 |

Table (7) shows the following:

- The existence of a negative relationship between debt/asset ratio and net profit margin, where the correlation coefficient is (-.760) and the level of significance is (.029).

- The existence of a negative relationship between debt/equity ratio and net profit margin, where the correlation coefficient is (-.886) and the level of significance is (.018).

- There is no relationship between the following solvency ratios (long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and net profit margin, as one of the dimensions of the profit margin, where the level of significance between each two variables more than (0.05).

- We accept the third null hypothesis partly with respect to ratios (long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and its refusal partly also with respect to the following ratios (debt/assets ratio, debt/equity ratio).

**Test the fourth hypothesis**: There is no statistically significant relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and operating cash flow margin.

**Table (8) The Results of Pearson Correlation between the Solvency and OCM**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | DAR | DER | LDAR | LDER | IC |
| OCFM | R | -.432 | -.491 | -.177 | -.277 | -.575 |
| Sig | .285 | .217 | .675 | .506 | .136 |

Table (8) shows the following:

- There is no relationship between any ratio of the five solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and operating cash flow margin as one of the dimensions of profitability, where the level of significance between each two variables is more than (0.05).  
- We accept the fourth null hypothesis which states that "there is no relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and operating cash flow margin.

**Test the fifth Hypothesis**: There is no statistically significant relationship between the following solvency ratios (debt/assets ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and the return on assets.

**Table (9) The Results of Pearson Correlation between the Solvency and ROA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | DAR | DER | LDAR | LDER | IC |
| ROA | R | -.753 | -.942 | -.290 | -.488 | .109 |
| Sig | .031 | .000 | .486 | .220 | .798 |

Table (9) shows the following:

- The existence of a negative relationship between debt/asset ratio and the return on assets, where the correlation coefficient is (-.753) and the level of significance is (.031).  
- The existence of a negative relationship between debt/equity ratio and the return on assets, where the correlation coefficient is (-.942) and the level of significance is (.000).  
- There is no relationship between the following solvency ratios (long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and the return on assets as one of the dimensions of profitability, where the level of significance between each two variables is more than (0.05).

- We accept the fifth null hypothesis partly with respect to ratios (long-term debt/ assets ratio, long-term debt/ equity ratio, and interest coverage) and its refusal partly also with respect to ratios (debt/assets ratio, debt/equity ratio).

**Discuss the results:**

1. The results show that the average solvency rates for the all companies studied is (0.456), where the company (GENI) enjoys a minimum rate of solvency through companies, where is (0.048). This result indicates that this company enjoys a high financial capacity due to the low rate of debt. This indicates that this company enjoys with a great financial independence, and it depends on internal financing to finance most of its assets. While the company (JPPC) are of highest solvency rate reaching (1.636). This result indicates that the company is suffering from the loss of financial independence because the debt exceeds its equity rate.

2. The average profitability rates for the companies studied is (0.0870), where the company (NDAR) has the lowest profitability rate (0.052-), while the company (GENI) has of the highest profitability rate (.216). Table (3) show that the company (NDAR) has a rate of solvency (1.012), the second-weakest company in terms of solvency. If we go back to the table (4) this company has the least profitability through companies with a profitability rate (0.052-). A comparison between the two results we note that there is objective in the results, as the high solvency rate up to one refers that the debt rate exceeds the rate of equity for this company. The increase in debt in this way will lead to increase fixed charges such as interest, which will reflect negatively on profitability, and this explains the low profitability rate of this company as the lowest rate. And vice versa for the company (GENI), we note that this company has the lowest debt, where its solvency rate is (0.048), while it enjoys per the results the highest profitability rate which is (0.216). This result is logical, because as the low solvency rate will lead to reduce the debts charges, which will reflect positively on profitability.

3. The results indicate that there is no relationship between all solvency ratios (debt/asset ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, interest coverage) and gross profit margin. This reflect that the debt charges incurred by the company, which is increasing with an increase in dependence on external financing of the assets, is deducted from the income statement after gross profit margin. It is therefore logical that there is no relationship between these two variables. this result varies with the study of (Nirajini, A \*, Priya, KB, 2013).

4. There is a negative relationship between the following solvency ratios (debt/asset ratio and debt/equity ratio) and operating profit margin, while there is no relationship between the following solvency ratios (long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and operating profit margin. We can explain the negative relationship between (debt/asset ratio, debt/equity ratio) and operating profit margin, that the higher debt to assets or equity ratio may lead to rise of financing costs, and then this will lead to reduce operating profit margin, because the financing costs are deducted as part of operating expenses. This result is consistent with the study of (Nirajini, A, Priya, KB, 2013). As for the lack of a relationship between the (long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) and operating profit margin, because the opinion of the researcher is that most of the sample firms did not have long-term loans, which coincided with low interest on loans. This result varies with the study of (Nirajini, A, Priya, KB, 2013) and study of (Hasan, et al., 2014).

5. There is a negative relationship between both solvency ratios (debt/asset ratio, debt/equity ratio) and net profit margin, while there is no relationship between the remaining solvency ratios (long-term debt/assets ratio, long-term debt/equity ratio, interest coverage) and net profit margin. We can explain the existence of the negative relationship between (debt/assets ratio and debt/equity ratio) and net profit margin, that the higher rise of debt to assets or to equity will lead to maximize financing costs, and thus will reduces net profit margin. This because the financing costs are usually deducting before net profit. Thus, the negative relationship between these two variables is a logical relationship. This result agrees with the study of (Nirajini, A, Priya, KB, 2013) and the study of (Hasan, et al., 2014).

6. There is no significant relationship between all the solvency ratios (debt/asset ratio, debt/equity ratio, long-term debt/assets ratio, long-term debt/equity ratio, interest coverage) and operating cash flow margin. This due to that such a margin affects only by cash receipts and payments made during the year. Therefore, it is natural that there is no relationship between this margin and solvency ratios.

7. There is a negative relationship between both solvency ratios (debt/asset ratio, debt/equity ratio) and the return on assets, while the remaining solvency ratios (long-term debt/assets ratio, long-term debt/equity ratio, and interest coverage) have no relationship with the return on assets. This result is consistent with the study of (Ebrati et al., 2013) and study of (Hasan, et al., 2014), while differ with the study of (Nirajini, A. and Priya, KB, 2013). It is a logical result, where that whenever the rising of debt to assets or equity will lead to increase financing costs, and therefore the return on assets will decline.

**Recommendations:**1. The need for further studies to include other sectors of Amman Bursa to explore the reality of the relationship between the variables studied more clearly.

2. The need for further studies that include longer periods of time to show the relationship between the variables of the study more clearly.

3. There is no doubt that (debt/assets ratio and debt/equity ratio) affect clearly and negatively, as referring by many, on profitability ratios, and therefore, companies should maintain a certain level of debt to maintain financial independence and reduce the interests, which will impact on profitability.

4. The need for further studies to include other ratios related to solvency ratios or profitability ratios.

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