



Exploring the relationship between liquidity and activity in food companies: a case study of leading global companies in the period 2012-2023

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Abstract:

This study aims to explore the relationship between liquidity and activity in four leading food companies from 2012 to 2023 in an attempt to create a structural model based on exploratory and confirmatory factor analysis between liquidity and activity ratios. The study found that the relationship between liquidity and activity is a strong inverse relationship that confirms that higher liquidity ratios will negatively affect activity.

Keywords: liquidity, activity, exploratory factor analysis, confirmatory factor analysis.

Jel Classification Codes : C21, G32.

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1. Introduction

The business world is witnessing increasingly intense competition, this increased competition pushes companies to exploit resources in order to accomplish objectives, and businesses have both short-term and long-term objectives. The company's long-term objective is to maximize value, while its short-term objective is to maximize profit utilizing the resources at its disposal, and for this reason companies need to evaluate performance so that they can achieve their goals and ensure their sustainability, and performance in a company can be seen through its ability to meet its short-term obligations. If companies are unable to meet their obligations when they reach their maturity dates, they face a number of risks and issues that affect its credibility with suppliers and customers, thus affecting its operational activities, a situation that will be reflected in the financial position, thus missing short-term investment opportunities. The availability of liquidity plays an important role in avoiding the inability of companies to fulfill short-term commitments and the existence of specific limitations of liquidity increases the flexibility of companies in dealing with suppliers and customers, which may improve their activity over time.

1.1 Problem of the study

One of the primary and essential components of a company's financial performance is liquidity. It reflects the ability to meet short-term financial obligations immediately. Liquidity plays an important role in improving the financial performance of companies and maintaining normal operations, which leads us to ask the following question:

How do liquidity ratios and activity in international food corporations relate to each other between 2012 and 2023?

1.2 Hypotheses of the study

In order to answer the question posed earlier, the following hypothesis was proposed:

- There is a statistically significant positive impact of liquidity ratios on activity ratios in global food companies during the period from 2012 to 2023.

1.3 Objectives of the study

- Finding the relationship of liquidity expressed as current, fast, and ready liquidity with activity expressed as asset turnover, receivables turnover, and payables turnover.
- Analyze the relationship's nature in various contexts and eras using robust statistical tools (constructivist modeling) to contribute to the accumulation of knowledge related to this dialectic.

1.4 Importance of the study

The study's significance comes from the fact that it tackles a crucial issue in financial management, namely liquidity, because of its role in the revitalisation of companies' businesses after learning about its impact on the various aspects of the activity and thus establishing an efficient management that is based on the planning and control of liquidity in a way that reduces the risk of inability to pay short-term obligations. This study will also provide local researchers with a reference framework for future studies on the evolution of Algeria's food industry sector, as determined by the patterns of top global businesses about the connection between activity and liquidity.

2. The theoretical side

2.1 Liquidity ratios

Many financial thinkers and practitioners have explained the ability of a company to suitably satisfy its short-term financial obligations is referred to as liquidity, and that large amount of

available cash mean that companies are in a position to meet their financial obligations as they fall due without default (Li & al., 2020). Liquidity is often associated with the risk of not being able to meet its obligations as they fall due, if a company is unable to meet its short-term obligations, it could face financial distress that has an impact on its survival (Sudiyatno & Suwarti, 2022), and liquidity affects:

- Day-to-day business operations, helping companies meet their financial obligations as they come due.
- Decision-making, through the ability to monetise current assets based on investment opportunities.
- Stabilising the company by protecting it from financial risks that arise over time.
- Capital structure, a highly liquid company can repay short-term debt, so it tends to minimise total debt in its capital structure (RESCHIWATI & al., 2020).
- Enhancing the confidence of parties interested in the company's activity, especially financiers, to invest in it (Effendie & al., 2022).

There are many factors that can affect a company's liquidity, including:

- Operating efficiency: operational efficiency can have a significant impact on liquidity, as more efficient companies can generate higher profits and provide liquidity.
- Market conditions: market conditions affect liquidity by affecting a company's sales and its ability to monetise assets.
- Financial management strategies: the ability to effectively manage assets and liabilities can affect liquidity. Companies that effectively manage money can maintain an appropriate level of liquidity.

2.2 Types of Liquidity Ratios

By comparing the company's short-term liabilities prior to maturity, liquidity ratios seek to assess and gauge its short-term financial capacity with the cash flows generated by current assets and are calculated by comparing the homogeneous totals of current assets

with short-term liabilities. The most important of these ratios are as follows:

- **Current ratio:** The amount that current assets cover current obligations is ascertained using the current ratio. The ability of the business to meet short-term obligations has grown as current assets surpass current liabilities.

$$\text{Current Liquidity} = \text{Current Assets} / \text{Short-Term Debt}$$

A low current ratio can show liquidation issues, and a high current ratio is not good as it shows a large amount of idle funds and lowers the profitability of the company (Effendie & al., 2022).

- **Quick ratio:** The current liquidity ratio has come under fire for treating current assets' constituent parts similarly, while their components should be scrutinised and correlated with fixed assets, hence the creation of the quick ratio. The ratio measures the company's ability to pay its short-term liabilities using the most liquid current assets and excluding inventories due to the difficulty of converting them into cash (Durrah & al., 2016) due to the various problems associated with their elements (loss of value, long marketing period, spoilage...).

$$\text{Quick Liquidity} = (\text{Current Assets} - \text{Inventories}) / \text{Short-term Debt}$$

- **Cash ratio:** the ratio expresses the company's ability to meet its short-term obligations through cash and cash equivalents such as demand deposits or deposits in banks that can be withdrawn at any time (Sitepu, 2022), i.e., liquidity amounts without relying on cash from the company's receivables.

$$\text{Liquidity} = \text{cash and cash equivalents} / \text{short-term debt}$$

2.3 Activity ratios

Activity ratios measure how effectively a company uses the assets it owns (Effendie & al., 2022). This group of ratios is used to evaluate how well a company manages its assets to produce revenues and profits or how well it can execute its daily operations (Lukman, 2024). The activity ratios affect:

- Corporate returns, as increased turnover rates increase the funds available to the company and thus increase investments in investment opportunities, which is reflected in returns.
- Share prices, as increased activity rates lead to higher investment spending, which increases demand for shares and raises their market prices.

2.4 Types of activity ratios

Activity ratios give a broad picture of how well a company manages its resources and uses them to meet its financial and operational goals. The most important of these ratios are as follows:

- **Asset turnover:** also known as asset productivity, it measures the contribution of a company's total assets to annual net sales revenue.

$$\text{Asset Turnover Rate} = \text{Sales Revenue} / \text{Total Assets}$$

- **Receivables turnover:** the success of the pre-disposal stage depends on this stage, as it starts from the date of sale to customers and continues until they turn into liquidity, so the following ratio expresses the number of times customers and ancillary accounts turn into liquidity, and the time frame in which clients are given the chance to settle their debts can be expressed by calculating the average collection period.

$$\text{Receivables Turnover Rate} = \text{Sales Revenue} / \text{Average Receivables}$$

- **Payables turnover:** this ratio expresses the number of times the company pays back the suppliers' obligations connected to exploitation, and the average repayment period can be calculated to express the amount of time the company is given to repay the exploitation debts.

$$\text{Accounts Payable Turnover} = \text{Total Purchases} / \text{Average Payables}$$

3. Applied side

The question of the liquidity-activity relationship within the company cannot be proven either negatively or positively until it is subjected to the practical reality, which is widely considered the most efficient indicator in giving accurate results through which sound decisions can be made to ensure survival in a highly competitive market.

3.1 Study population and sample:

According to the previous argument, in order to explain the relationship between liquidity and company activity, a group of companies operating in the market must be used. This will provide a clearer picture of the form of that relationship, which is why a sample of four American organizations operating in international markets was chosen, which can be illustrated as follows:

- Coca Cola Company.
- PepsiCo Company.
- Tyson Foods Company.
- Campbell Soup Company.

3.2 Study variables

Considering the data available for the previous organisations during the period 2012-2023 and calculating the financial ratios for the two variables under study (i.e., liquidity and activity) and considering the multiple ratios proposed to explain each of the

previous variables, the appropriate method to address the above proposition is structural equation modeling (SEM).

Following the exploratory factor analysis, we proceed to the confirmatory factor analysis model, which can track the various effects of the structure of relationships within the liquidity-activity. This process links the various relationships that govern the behavior of the impact between liquidity as an independent variable and activity as a dependent variable. This is done in light of the multiple ratios that can be used in each variable, especially the dependent variable.

Initially, a set of explanatory financial ratios can be identified for each of the study variables, which can be coded as follows:

Table 1. Coding of study variables

Activity Rate	Coding	Liquidity Rate	Coding
Asset Turnover	A1	Current Liquidity	L1
Receivables Turnover	A2	Quick Liquidity	L2
Payables turnover	A3	Cash Liquidity	L3

Source: Prepared by the researchers.

According to the foregoing, in order to employ structural equation modeling, the study's variables must first be subjected to the exploratory factor analysis principles, which allow for the possibility of reducing the number of variables that make up the main variable (such as the financial ratios that form the activity) to a smaller number known as factors.

3.3 Exploratory factor analysis is used to identify the study's factors.

There are two primary variables in this study: liquidity and activity, so exploratory factor analysis should be used for each variable separately.

3.3.1 Using exploratory factor analysis to extract liquidity factors:

In principle, as previously discussed, there are three primary ratios in the liquidity index: Current Liquidity Ratio L1, Quick Liquidity Ratio L2 and Cash Liquidity Ratio L3. Using the data and using the correlation matrix, we find:

Table 2. Correlation matrix of the liquidity index forming ratios
Correlation Matrix^a

		L1	L2	L3
Correlation	L1	1,000	,575	,198
	L2	,575	1,000	,580
	L3	,198	,580	1,000
Sig. (1-tailed)	L1		,000	,089
	L2	,000		,000
	L3	,089	,000	

a. Determinant = ,426

Source: SPSS outputs.

Looking at the correlation matrix of the ratios forming the Liquidity Index, it can be seen that there are significant correlations (Sig < 0.05) between the three ratios that exceed the 57% threshold, giving the possibility of combining them into one index (i.e., one latent factor).

The KMO and Bartlett's tests listed in the following table indicate:

Table 3. KMO and Bartlett's tests for liquidity ratios

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,498
Bartlett's Test of Sphericity	Approx. Chi-Square	38,572
	Df	3
	Sig.	,000

Source: SPSS outputs .

Looking at the KMO test for the mapping fit scale, the correlations are generally not at the 0.498 level, so an adjustment is required before merging.

Consider the saturation table below:

Table 4. Saturation values for liquidity ratios.
Communalities

	Initial	Extraction
L1	1,000	,535
L2	1,000	,845
L3	1,000	,541

Extraction Method: Principal Component Analysis.

Source: SPSS outputs.

The saturation table indicates that L1 had the lowest percentage, so we delete it and continue with the statistical evaluations:

Looking at the adjusted correlation matrix, we observe:

Table 5. Correlation matrix for liquidity ratios after adjustment
Correlation Matrix^a

		L2	L3
Correlation	L2	1,000	,580
	L3	,580	1,000
Sig. (1-tailed)	L2		,000
	L3	,000	

a. Determinant = ,663

Source: SPSS outputs.

It is evident from the adjusted correlation matrix that there is a respectable and noteworthy association between L2 and L3 that is close to the threshold of 58%, which gives the possibility of combining these two ratios into a latent factor, and the matrix's

determinant is greater than 0.00001, indicating the absence of multicollinearity.

KMO and Bartlett's tests are used in the following table:

Table 6. KMO and Bartlett's tests for liquidity ratios after adjustment

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,500
Approx. Chi-Square		18,682
Bartlett's Test of Sphericity	df	1
	Sig.	,000

Source: SPSS outputs.

The KMO test with a threshold of 0.500 indicates that the sample size is large enough to carry out the factor analysis, and the Bartlett's significant test indicates that the correlation matrix is statistically different from the unit matrix.

The previous results indicate that the two ratios can be combined into a single factor axis whose explanatory power is determined in the following table:

Table 7. variance values for factors extracted from liquidity ratios.

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,580	79,015	79,015	1,580	79,015	79,015
2	,420	20,985	100,000			

Extraction Method: Principal Component Analysis.

Source: SPSS outputs.

According to the above table, the factor structure is realized in a single latent factor that can be regarded as a liquidity indicator. This extracted factor accounts for roughly 79.01% of the variance of the ratios that are displayed, and its Kaiser's coefficient of 1.580 shows that it explains more than 1.5 times as much as a single variable could.

From the above, the exploratory factor analysis was able to form a liquidity index that explains 1.5 times the explanatory power of a single variable with a total variance of approximately 80%, which gives an initial insight into the behaviour of this index theoretically before confirming or denying these results using confirmatory factor analysis.

3.3.2 Extracting activity factors through exploratory factor analysis:

Asset Turnover Ratio A1, Receivables Turnover Ratio A2, and Payables Turnover Ratio A3 are the three primary ratios that make up the activity indicator in theory, as was discussed previously. Making use of the correlation matrix, we find:

Table 8. Correlation matrix for activity ratios
Correlation Matrix^a

		A1	A2	A3
Correlation	A1	1,000	,712	,881
	A2	,712	1,000	,601
	A3	,881	,601	1,000
Sig. (1-tailed)	A1		,000	,000
	A2	,000		,000
	A3	,000	,000	

a. Determinant = ,109

Source: SPSS outputs.

The determinant of the correlation matrix shows that there is no linear dependence between rows or columns (no multicollinearity), while the preceding table shows that there are acceptable significant correlations between the adopted ratios above the 71% level.

The KMO and Bartlett's tests listed in the following table indicate:

Table 9. KMO and Bartlett's tests for activity ratios

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,648
Approx. Chi-Square		99,946
Bartlett's Test of Sphericity	df	3
	Sig.	,000

Source: SPSS outputs.

The KMO test indicates that the sample size is large enough to perform the factor analysis, and Bartlett's significant test indicates that the correlation matrix is statistically different from the identity matrix.

The above results give the possibility of incorporating the adopted ratios into a latent factor or factors, which we include in the table:

Table 10. variance values for factors extracted from activity ratios.

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,469	82,292	82,292	2,469	82,292	82,292
2	,428	14,254	96,546			
3	,104	3,454	100,000			

Extraction Method: Principal Component Analysis.

Source: SPSS outputs.

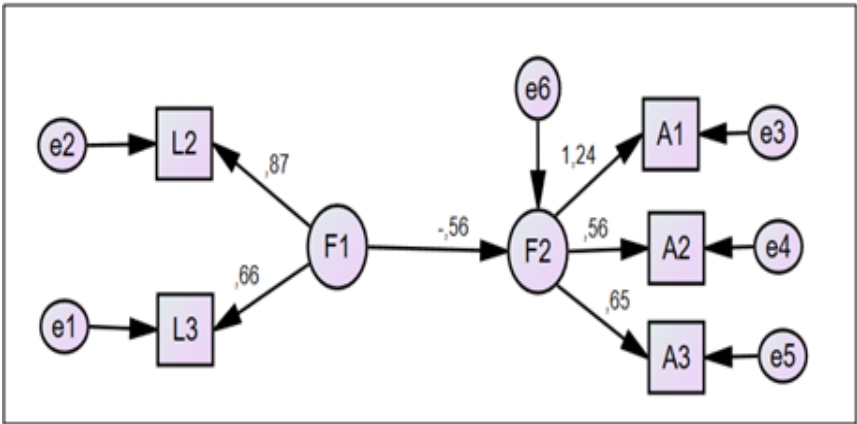
The extracted factor explains roughly 89.29% of the common variance of the ratios shown, and the Kaiser test of 2.469 shows that the extracted factor explains roughly 2.5 times as much as a single variable can. The table shows that the factor structure is achieved in one latent factor that can be thought of as an indicator of activity.

Based on the above, in principle, a single activity index can be adopted that combines the three approved ratios, but this conclusion remains preliminary and needs to be confirmed or denied through the use of confirmatory factor analysis in the next part of the study.

3.4 Confirmatory factor analysis is used to construct the study's structural model:

The extracted factors cannot in any case be known for their structural validity without subjecting them to the principles of confirmatory factor analysis, which requires the use of structural equation models, which we try to address in this section.

Fig.1. Proposed structural model of the relationship between liquidity and activity



Source: Amos program outputs .

From the previous figure, we can see that there are acceptable statistical estimates for the proposed structural model, and this trend is supported by the results of the following table of estimates:

Table 11. Structural model estimation of the relationship between the liquidity of a firm's activity.

			Estimate	S.E.	C.R.	P	Label
F2	<---	F1	-11,636	3,994	-2,913	,004	
L2	<---	F1	1,000				
L3	<---	F1	,469	,096	4,880	***	
A3	<---	F2	1,000				
A2	<---	F2	,554	,117	4,740	***	
A1	<---	F2	,425	,078	5,433	***	

Source: Amos program outputs.

From the previous table, it can be seen that the statistical significance of all the structural model estimators was achieved at the 5% level, which prompts us to move on to the next stage, which is concerned with the matching criteria, which are presented in the following table:

Table 12. Values of conformity indicators for the constructivist model

Indicator	Indicator value	Indicator values indicating a match (typical indicator values)
Absolute Fit indice		
Chi square	Equals 17,058 With 4 degrees of freedom P = 0.002	The critical values of 1 and 5 should represent the range of the estimated Chi square to degrees of freedom ratio. If it is less than 1, it indicates a poor fit, and if it exceeds 5, the model needs further optimisation.

		Looking at the ratio achieved in the estimated model, we find: $CMIN/DF=4.26$, which indicates a good model fit.
Parsimony Correction Indices		
ECVI (Expected Cross- Validation)	Current model = 0.831 Saturated model = 0.638 Independent Model = 3.981	The current model's indicator value needs to be lower than the independent model's indicator value.
AIC (Akaike Information Criterion)	Current Model = 39,058 Saturated Model = 30,000 Independent Model = 187,124	The indicator value for the current model must be smaller than the indicator value for the independent model.
CAIC (Consistent Akaike Information Criterion)	Current Model = 70,641 Saturated Model = 73,068 Independent Model = 201,480	Indicator values for the independent model must be greater than those for the present model.

Source: Amos program outputs.

It is clear from the preceding table that the estimated model and the data match, or, to put it another way, that the suggested theoretical model and the sample data match. This increases the likelihood that the model will be used as a foundation for studying the relationship between liquidity and activity in the company.

3.5 Examine the outcomes using the estimated structural model:

The results obtained from the exploratory and confirmatory factor analyses confirm the existence of statistically significant

relationships between the latent factors (liquidity and activity) and the constituent elements (financial ratios and extracted factors), which prompts the adoption of these results and the structural model as a basis for analysing the liquidity-activity relationship in the company. Structurally, given the adopted model, it can be concluded that:

- The estimated model is consistent with the principles of economic theory in that the relationship between liquidity and activity is an inverse relationship that confirms that high liquidity rates above the required limit will negatively affect the activity system within the company—this is on the one hand—and on the other hand, the direct relationships presented by the adopted ratios with their indicators (each ratio structure with its indicator) are consistent with what economic theory proposes, which leads to the achievement of the structural model of economic tests, which enhances its quality and gives the possibility of analysis according to what has been achieved.
- With reference to the table of estimates, the relationship between liquidity and activity is a strong inverse relationship; each increase in the liquidity index by one standard unit will result in a decline in activity performance by 11.63 standard units, which clearly shows the danger of not managing liquidity well and what this means in terms of significant declines in activity and to the extent that will later lead to the company's exit from the market, especially in light of the great changes in the markets with intensified competition within them;
- Tyson Foods was the most active company during the period, according to the values of the operational axes shown. With regard to its liquidity index, we discover that it was able to keep it within reasonable bounds, further solidifying its position as the world's largest meat producer.
- Compared to the prior company's performance, Coca Cola recorded the lowest values over the period; this modest activity was accompanied by poor liquidity control compared to the rest of the companies (note that the liquidity index is close to one standard and exceeds that limit in some years). If we compare the performance of this company with its competitor PepsiCo, we find that the latter had

the most controlled liquidity, especially during the end of the study period, which made its activity better, although it did not reach the activity of Tyson Foods (which is why Pepsi activity is marked with negative values).

- With reference to Campbell Soup Company (the leading soup producer in the world), we find that it was the most controlled liquidity compared to the rest of the companies, which enhanced its activity and made it better than that achieved by Pepsi and Coca Cola, but here the question arises as to why it did not reach the level of activity achieved by Tyson Foods. This is because the relationship between liquidity and activity can also be determined by the nature of the activity itself, as the demand for meat cannot be compared with the demand for soup, which means that the size of the relationship between liquidity and activity must also take into account the area targeted by the company in the course of its activity.

4. Conclusion

The study of the relationship between liquidity and activity in the company is a very important topic for both financial analysts and decision-makers within companies, but the learner of this topic is quickly confronted with the issue of the multiplicity of ratios offered for each of the two indicators (both liquidity and activity) and the way to choose the best one in order to obtain more accurate results.

The results of the study were as follows:

- The Structural Equation Modeling (SEM) methodology provides an acceptable solution to deal with the previously raised issue (multiple ratios) because multiple ratios can be combined into fewer indicators or factors, which enhances the chances of providing easier and more accurate analyses compared to other methods.
- Using the structural model, the study established the reality of the strong inverse relationship between liquidity and activity, which companies must manage properly (holding the amount of needs) to strengthen their activity system and ensure their survival in a highly competitive market;

- The relationship between liquidity and activity must take into account a fundamental point that is fundamentally related to the nature of the activity itself, as the field of doing business is an important factor that must be raised when talking about the amount of liquidity that must be maintained to support the various activities carried out by companies.

5. Bibliography List:

- Durrah, O., & al. (2016). *Exploring the Relationship between Liquidity Ratios and Indicators of Financial Performance: An Analytical Study on Food Industrial Companies Listed in Amman Bursa*. *International Journal of Economics and Financial*, 6(2), 435-441.
- Effendie, J. M., & al. (2022). *Analysis of the Effect of Liquidity Ratios, Solvency and Activity on the Financial Performance of the Company (Literature Review of Corporate Financial Management)*. *DINASTI international journal of economics, finance and accounting*, 3(5), 541-550.
- Li, K., & al. (2020). *Liquidity and Firms' Financial Performance Nexus: A Panel Evidence From Non-Financial Firms Listed on the Ghana Stock Exchange*. *SAGE Open*. doi:10.1177/2158244020950363
- Lukman, S. D. (2024). *Activity Ratio to Measure Performance at PT. Jesry Karya Engenering Makassar City*. *Managenent journal*, 4(2), 61-66.
- RESCHIWATI, R., & al. (2020). *Effect of Liquidity, Profitability, and Size of Companies on Firm Value*. *Utopía y Praxis Latinoamericana*, 25(6), 325-331. doi:10.5281/zenodo.3987632
- Sitepu, E. (2022). *Analysis of Cash Ratio, Firm Size and Return on Assets that Influence Dividend Payout Ration Soe Companies Listed on the Indonesia Stock Exchange*. *International Journal of Applied Finance and Business Studies*, 9(4), 133-140.
- Sudiyatno, B., & Suwarti, T. (2022). *The Role of Liquidity in Determining Firm Performance: An Empirical Study on Manufacturing Companies in Indonesia*. *European Journal of Business and Management Research*, 7(6), 183-188.