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Factors Affecting Net Cash Flow: A Study of Food Enterprises in Vietnam

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Article Info

Abstract
This study analyzes the factors affecting net cash flow (NCF) of food companies listed on the Vietnamese stock market during the period 2018–2024, using panel data regression models and statistical analysis with SPSS 27 software. The results show that both accounts receivable (AR) and accounts payable (AP) have a positive impact on NCF, emphasizing the important role of credit and debt management in maintaining stable cash flow of food enterprises. In contrast, inventories (INV) have a negative impact on NCF, reflecting liquidity risk due to capital tied up in raw materials and products with short shelf lives, reducing cash generation. In addition, the study did not find a significant relationship between liquidity ratio (CR), cash conversion cycle (CCC) and NCF, indicating that short-term liquidity is not the main determinant of Net cash flow in the food industry. Firm size (SIZE) has a positive effect on NCF, indicating that larger firms enjoy scale advantages and access to capital, while firm age (AGE) has a weak negative relationship, suggesting that older firms may face challenges in cash flow management. These findings highlight the need for effective management of inventory and receivables to optimize cash flow in food businesses.

1. Introduction

Cash flow plays a key role in ensuring the financial sustainability and operational efficiency of a business. Among the indicators reflecting financial efficiency, net cash flow - especially net cash flow from operating activities - is considered one of the important measures of a business's ability to generate real cash flow, serving the payment of short-term obligations, expansion investment and enhancing long-term business value. For developing economies like Vietnam, where the financial system and capital market are still in the process of completion, effective cash flow management becomes even more urgent.

The food industry in Vietnam is one of the industries that contributes greatly to GDP, creates jobs and has high export potential. However, businesses in this industry often face many specific challenges such as: long production cycles, perishable inventories, fluctuations in input material prices and dependence on seasons. These factors can directly affect the structure and fluctuations of cash flows, requiring financial decisions to be adjusted to suit industry characteristics.

Although cash flow is a topic that receives much attention in corporate finance research, most of the current empirical studies are focused on developed countries or research at the interdisciplinary level, without delving into the characteristics of each specific industry. Meanwhile, the application of financial theories such as Net cash flow Theory, Agency Theory, Pecking Order Theory or Trade-off Theory needs to be tested in specific economic contexts to be able to promote practical explanatory effectiveness.

Based on the above research gap, this paper aims to identify and measure factors affecting net cash flow at food enterprises in Vietnam, through panel data from listed companies over a period of many years. The factors considered include: profitability, enterprise size, financial leverage, growth rate and working capital management efficiency. This study is not only meaningful in testing the theory but also brings practical implications in financial management of food enterprises in Vietnam.

The main research questions are:

1. What are the internal factors affecting the net cash flow of food enterprises in Vietnam?
2. What is the level and direction of impact of these factors?

The findings aim to support better decision making and enhance the financial sustainability of food companies.

2. Theoretical and Empirical Background
2.1. Theoretical Background
Net cash flow (NCF) is an important financial metric that reflects the cash a firm generates after covering its capital expenditures. Unlike accounting profits, NCF focuses on the actual liquidity available for reinvestment, debt repayment, or shareholder returns. Popularized by Jensen (1986) in the agency theory, NCF is considered a sign of financial strength and a potential source of inefficiency if misused by managers for unprofitable projects or personal gain. Therefore, understanding the determinants of NCF is important for firm performance, governance, and investment decisions.
Several financial theories provide insight into the factors that influence NCF:
Agency theory (Jensen & Meckling, 1976) [6] highlights the conflict between managers and shareholders. When firms have excess NCF, managers may misuse it unless governance mechanisms, such as debt discipline or close monitoring, are put in place to align interests.
Pecking order theory (Myers & Majluf, 1984) [8] suggests that firms prefer internal financing to external financing due to information asymmetry. Firms with high NCF may avoid capital markets and finance more efficient projects. Firms with volatile cash flows adjust their reserves based on investment needs rather than fixed targets (Frank & Goyal, 2009).
Trade-off theory emphasizes balancing the tax benefits of debt against the risk of financial distress. Moderate levels of debt can increase NCF through discipline, while excessive leverage reduces flexibility. Models by Miller & Orr (1966) [7] and others suggest that firms hold cash to hedge against uncertainty, reducing the risk of distress (Ferreira & Vilela, 2004) [3]. These theories frame the empirical exploration of the determinants of NCF, especially in industries such as construction, where capital intensity and cash flow volatility make effective cash management essential.

2.2. Overview of empirical research
NCF is an important concept in financial research, reflecting the internal financial capacity and value creation potential of a company. Many studies in the world have analyzed the factors affecting net cash flow or cash flow from business activities:
Deloof (2003) [2] studied Belgian enterprises and found that the efficiency of working capital management (such as collection period, inventory cycle) has a significant impact on cash flow and profitability of enterprises. Gill *et al.* (2010) [4] in Canada demonstrated that profitability, enterprise size and working capital management efficiency all have a positive impact on net cash flow from business activities. Ahmed & Hossain (2016) [1] analyzed data in Bangladesh and found that financial leverage and asset growth have a close relationship with net cash flow fluctuations.
In Vietnam, studies related to net cash flow mainly focus on the accounting or financial synthesis perspective, there are few in-depth works on the impact of internal factors of enterprises in the food industry. Some typical studies are:

Nguyen Thi Bich Ngoc (2019) analyzed the relationship between net cash flow and solvency of enterprises listed on HOSE. Tran Van Nam & colleagues (2021) [10] showed that asset utilization efficiency and financial leverage are factors that clearly affect cash flow at Vietnamese manufacturing enterprises.
However, there has been no study that has analyzed in depth the factors affecting net cash flow in the food industry, in the context of a specific domestic market and strong input fluctuations. Focusing on research on this industry group not only clarifies the cash flow operating mechanism but also provides a scientific basis for financial planning suitable to the characteristics of the industry and the current economic context of Vietnam.

3. Research Methodology
3.1. Research Data
This study uses a quantitative method, exploiting secondary data from 70 food industry enterprises listed on two Vietnamese stock exchanges (HOSE and HNX) in the period 2017–2023, corresponding to 490 observations. Data are collected from audited annual financial reports, publicly disclosed on the enterprises' websites and official information portals such as Vietstock, FiinPro and the State Securities Commission.
The sample selection is based on the following criteria: (i) enterprises belong to the food production and processing industry group according to the secondary industrial sub-sector (VSIC); (ii) have complete and consistent financial data during the research period; (iii) eliminate enterprises with unusual or exceptional data. To process panel data, the study uses panel data regression to control for individual characteristics of each enterprise and over time. The Hausman test is applied to choose between the fixed effects model and the random effects model, ensuring the suitability and statistical validity of the analytical model.

3.2. Description of research variables and hypotheses
Based on the theoretical framework and previous empirical studies, the research model is built to test the factors affecting the net cash flow (NCF) of food enterprises in Vietnam. The selected factors include working capital management characteristics, enterprise characteristics and control factors. The specific model is as follows:

$$NCF_{it} = \alpha + \beta_1 INV_{it} + \beta_2 AR_{it} + \beta_3 AP_{it} + \beta_4 CR_{it} + \beta_5 CCC_{it} + \beta_6 SIZE_{it} + \beta_7 AGE_{it} + \varepsilon_{it}$$

Dependent variable
Net cash flow (NCF): Is the remaining cash flow after the enterprise makes necessary investments in fixed assets and working capital for production and business. NCF is an indicator reflecting the ability to generate real cash flow, playing a central role in making investment decisions, financing and paying dividends. How to determine:

NCF = [Earnings before interest and tax × (1 – Corporate income tax rate) + Depreciation] – Fixed asset investment expenditure – Change in working capital

Independent variables
- **Inventory (INV):** In the food industry, inventory mainly includes raw materials (fresh food, processed raw materials), unfinished products and finished products.

Due to the perishable nature, maintaining high inventory levels can increase storage costs, reduce capital efficiency and negatively affect cash flow.

- **Accounts receivable (AR):** Are sales revenue that has not been collected, often arising from distribution contracts with supermarkets and agents. This indicator reflects the business's trade credit policy. A high AR level indicates slow collection, which can put pressure on operating cash flow.
- **Accounts payable (AP):** Reflects short-term financial obligations to suppliers of raw materials, packaging, transportation, etc. Extending payment terms can help businesses maintain positive cash flow, but also poses the risk of supply chain disruption.
- **Current Ratio (CR):** Measures the ability to pay short-term debts with current assets. In the food industry, due to its fast turnover and high seasonality, CR shows the financial flexibility of the business.
- **Cash Conversion Cycle (CCC):** Shows the time from spending money to buy raw materials until collecting money from customers. The shorter the CCC, the more favorable the cash flow. CCC is calculated as:

$$CCC = DIO + DSO - DPO$$

DIO: Days of inventory
DSO: Days of sales collection
DPO: Days of payment to suppliers

Control variables
- **Enterprise size (SIZE):** Reflects financial capacity and operational efficiency. Large enterprises often have stable distribution systems, efficient supply chains and higher access to capital. SIZE is measured by the natural logarithm of total assets:

$$SIZE = ln(Total\ assets)$$

- **Enterprise age (AGE):** Reflects the level of stability, operational experience and market relationships. Long-standing food enterprises often have a loyal customer base and tighter financial control processes. AGE is calculated as:

$$AGE = Year\ of\ observation - Year\ of\ establishment\ of\ the\ enterprise$$

A summary of the variables and hypotheses is as follows:

Variable	Symbol	Measurement	Effect	Hypothesis
Free Cash Flow	NCF	[EBIT × (1 – Corporate Income Tax Rate) + Depreciation] – New Fixed Asset Investment – Change in Working Capital	Dependent Variable	—
Inventory	INV	Inventory as a proportion of total assets	(−)	H1: Inventory has a negative impact on NCF
Accounts Receivable	AR	Accounts receivable as a proportion of total assets	(−)	H2: Accounts receivable have a negative impact on NCF
Accounts Payable	AP	Accounts payable as a proportion of total assets	(+)	H3: Accounts payable have a positive impact on NCF
Current Ratio	CR	Current assets / Current liabilities	(+)	H4: Current ratio has a positive impact on NCF
Cash Conversion Cycle	CCC	DIO + DSO − DPO	(−)	H5: Cash conversion cycle has a negative impact on NCF
Firm Size	SIZE	ln(Total assets)	(+)	H6: Firm size has a positive impact on NCF
Firm Age	AGE	Year of observation − Year of establishment	(+)	H7: Firm age has a positive impact on NCF

4. Research results
4.1. Descriptive statistical analysis

Table 1: Descriptive statistics

	Minimum	Maximum	Mean	Std. Deviation
NCF	9223.3	200424434	9223	20800261.3
INV	409	110156937	922337	10943076
AR	3909	72785583	2513816	8022464
AP	38.9	286651052	7274222	28646027
CR	.102	20.550	2.46611	2.279989
CCC	-491737	3420376	7347	156417
SIZE	10.388	19.876	14.759	1.496239
AGE	7	50	18.90	10.085

Source: Author's calculation from SPSS 27 software

Table 1 presents descriptive statistics for the variables used in this study, including the number of observations (N), minimum value (Min), maximum value (Max), mean value (Mean) and standard deviation (Std. Deviation).

Variables such as NCF, CCC, INV, AR and AP have a very large dispersion, showing the diversity of operating models, scales and financial strategies in the food industry.

Some variables have large outlier values (especially CCC) that need to be checked and handled during regression analysis to ensure the reliability of the model.

The descriptive results are the basis for determining which variables can significantly affect net cash flow and for adjusting the regression model accordingly.

4.2. Correlation analysis

Table 2: Correlation between variables

	NCF	INV	AR	AP	CR	CCC	SIZE	AGE
NCF	1.000	.800	.913	.910	-.070	-.014	.655	-.099
INV	.800	1.000	.852	.880	-.053	-.011	.646	-.089
AR	.913	.852	1.000	.927	-.081	-.015	.613	-.112
AP	.910	.880	.927	1.000	-.093	-.013	.584	-.066
CR	-.070	-.053	-.081	-.093	1.000	.417	-.118	.016
CCC	-.014	-.011	-.015	-.013	.417	1.000	-.013	.102
SIZE	.655	.646	.613	.584	-.118	-.013	1.000	-.001
AGE	-.099	-.089	-.112	-.066	.016	.102	-.001	1.000

Source: Author's calculation using SPSS 27 software

The results from Table 2 show that:
The variables that are strongly correlated with NCF include: AR = 0.913; AP = 0.910; INV = 0.800. These are variables that have a strong positive correlation with NCF, indicating that when receivables, payables and inventories increase, net cash flow also tends to increase. This may reflect that larger scale of operations leads to higher NCF.
SIZE has a moderate positive correlation with NCF (r = 0.655), indicating that larger firms tend to generate better NCF.
CR and CCC have a weak or very weak correlation with NCF (-0.070 and -0.014, respectively), indicating that: CR and CCC do not significantly affect net cash flow in this sample. The weak negative correlation with CR suggests that holding too much current assets may not help improve free cash flow.
Age of the enterprise (AGE) has a very weak negative correlation with NCF (-0.099), there is no clear relationship.
Potential multicollinearity:

AR – AP: r = 0.927, AR – INV: r = 0.852, INV – AP: r = 0.880

The very high correlation coefficients between the explanatory variables (AR, AP, INV) indicate that it is necessary to check for multicollinearity when entering the regression model (using VIF or Tolerance).

4.3. Analysis of regression results

Table 3: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	1	2.107E+17	7	2.656E+16	494.049	.000[b]

Source: Author's calculation using SPSS 27 software

The ANOVA results in Table 3 show the overall significance of the regression model. The F statistic is 494.049 and the p value is 0.000, confirming that the independent variables together explain a significant portion of the variation in NCF. This result supports the inclusion of the selected explanatory variables in the regression analysis.

Table 4: Model summary statistics.

Model	R	R Square	Adjusted R Square	Sig. F Change	Durbin-Watson
1	.939[a]	.882	.882	0.000	1.992

Source: Author's calculations using SPSS 27 software

Table 4 presents the model summary statistics, showing an R^2 value of 0.882, indicating that approximately 88.2% of the variation in NCF is explained by the independent variables. This high explanatory power indicates a strong model fit. The adjusted R^2 remains at 0.882, confirming that the model remains robust even after adjusting for the number of predictors.
The Durbin-Watson statistic is 1.992, which is within the acceptable range (1.5–2.5), indicating that autocorrelation is not a concern in the regression model.

Table 5: Regression coefficients and multicollinearity diagnosis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity statistics VIF
		B	**Std. Error**	**Beta**			
1	(Constant)	-35903753.632	4512551.287		-7.956	.000	
	INV	-.367	.070	-.189	-5.205	.000	5.193
	AR	1.126	.116	.434	9.711	.000	7.841
	AP	.412	.035	.567	11.615	.000	9.348
	CR	362589.799	187241.213	.035	1.936	.053	1.245
	CCC	-1.459	2.376	-.011	-.614	.539	1.227
	SIZE	2622747.614	306834.944	.184	8.548	.000	1.822
	AGE	-61801.948	34066.882	-.030	-1.814	.070	1.047
a. Dependent Variable: NCF							

Source: Author's calculations using SPSS 27 software

Table 5 presents the results of multiple regression analysis, estimating the impact of various financial ratios on NCF. The findings are as follows:
INV has a negative and significant impact on NCF (β = -0.367, p = 0.000). This is contrary to the initial hypothesis (H1), which states that higher inventory levels reduce free cash flow, possibly due to capital being tied up in unsold goods. AR has a strong positive impact on NCF (β = 1.126, p = 0.000), indicating an efficient collection mechanism. AP also has a positive impact on NCF (β = 0.412, p = 0.000), supporting the idea that delaying payments improves short-term cash flow. CR has a positive but insignificant effect (β = 362,589.799, p = 0.053) and CCC has a negative but insignificant effect (β = -1.459, p = 0.539). SIZE has a positive effect on NCF (β = 2,622,747.614, p = 0.000), while AGE has a weak negative effect (β = -61,801.948, p = 0.070). High VIF values for AR, AP, and INV indicate potential multicollinearity problems.

5. Discussion of the Results
The empirical results of the study provide important insights into the financial factors that influence net cash flow (NCF) in food industry firms – a sector with its own characteristics in terms of production cycles, input material management and operating cost pressures. Some highlights from the regression findings and comparisons with previous studies are as follows:
The study found a negative and significant impact of

inventories (INV) on NCF, indicating that when capital is tied up in raw material, finished goods or semi-finished goods inventories, firms will have a reduced ability to generate free cash flow. This is consistent with the results of Richardson (2006) and Jensen (1986) [5], which emphasize the importance of effective inventory management in the food industry, which is characterized by high variability in demand and product shelf life.

Accounts receivable (AR) has a positive and strong impact on NCF, suggesting that fast and efficient debt collection enhances cash flow. This result is consistent with the study of Nguyen & Tran (2020) [10] but contrary to Opler *et al.* (1999), which found that in the food industry, good debt management plays an important role in ensuring liquidity.

Accounts payable (AP) also has a positive impact on NCF, supporting the view that delaying payments to suppliers is an effective financial tool for businesses to improve cash flow without negatively affecting supply relationships – which is important in the food industry with complex supply chains and high flexibility.

Current ratio (CR) has a positive but insignificant impact, while cash conversion cycle (CCC) has a negative but statistically insignificant relationship. This suggests that short-term liquidity may not be a strong determinant of net cash flow in the food industry, where other factors such as raw material management and production play a larger role.

Firm size (SIZE) has a positive and significant effect on NCF, confirming that larger food firms benefit from economies of scale, better bargaining power with suppliers, and easier access to capital (Myers & Majluf, 1984) [8].

Finally, firm age (AGE) shows a weak and negative effect, which may reflect inefficiencies or technological innovation pressures in older firms, but the results are not strong enough to draw firm conclusions.

6. Conclusions and policy implications
1. Conclusions
The study highlights that in the Vietnamese food industry, working capital management, especially inventory control and receivables management, along with firm size are key factors influencing net cash flow (NCF). In contrast, liquidity ratio and firm age have a more limited impact. These results confirm the importance of optimizing cash flow and expanding scale in the food industry, which is characterized by short production cycles, the need for tight management of raw materials and finished products, as well as the pressure of continuous competition and innovation.

2. Policy implications
- **For food business managers**
  It is necessary to develop an effective inventory management policy to avoid capital being tied up in raw materials and finished products, especially for products with short shelf lives. Strengthen debt collection to protect cash flow and minimize financial risks. At the same time, take advantage of payment time with suppliers as a financial tool to improve short-term cash flow without affecting long-term cooperation relationships, helping to balance financial efficiency and maintain a stable supply chain.
- **For financial and banking policy makers**
  It is necessary to design flexible credit packages that are suitable for the characteristics of the fast production and consumption cycle of the food industry, while supporting businesses in managing short-term cash flow and investing in technological innovation. Encourage the development of alternative financial instruments such as capital markets and corporate bonds to help businesses diversify their capital sources and reduce dependence on traditional bank credit.
- **For investors and lenders**
  Do not just focus on traditional short-term liquidity indicators but also evaluate the ability to manage working capital, especially the ability to control inventory and debt - factors that determine the debt repayment capacity and sustainable profits of food businesses. Priority is given to large-scale companies with good cash flow management and stable development strategies.

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