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Ritu Jain
Assistant Professor,
Department of Commerce
BT Institute of Excellence,
Makroniya Sagar, Madhya Pradesh, India

Corresponding Author:
Ritu Jain
Assistant Professor,
Department of Commerce
BT Institute of Excellence,
Makroniya Sagar, Madhya Pradesh, India

Cash flow sensitivity of cash in the era of startups and unicorns in India

Ritu Jain

Abstract
This study investigates the cash flow sensitivity of cash (CFSC) among Indian startups and unicorns, sectors characterized by high growth, significant venture capital involvement, and often delayed profitability. Using a panel dataset of 120 Indian startups and unicorns from 2017 to 2025, the analysis finds that the average cash holdings are 21.5% of total assets, while the mean operating cash flow is 12.5% of total assets. Regression results indicate that operating cash flow has a significant positive effect on cash holdings (coefficient = 0.427, $p < 0.01$), while leverage negatively influences cash holdings (coefficient = -0.128, $p < 0.05$). These findings highlight precautionary cash accumulation behavior of financially constrained firms and the role of internal cash flows in liquidity management. The results have implications for investors, policymakers, and entrepreneurs seeking sustainable growth and financial resilience in India's dynamic startup ecosystem (Almeida, Campello, & Weisbach, 2004; Bruinshoofd, 2003; Kaplan & Strömberg, 2009).

Keywords: Cash Flow Sensitivity of Cash (CFSC), Indian Startups, Unicorns, Venture Capital, Financial Constraints, Liquidity Management

1. Introduction
Cash management is a cornerstone of corporate finance, reflecting a firm's ability to meet obligations, invest in growth opportunities, and withstand shocks. The concept of cash flow sensitivity of cash (CFSC) captures how firms adjust their cash holdings in response to internal cash flow changes (Almeida, Campello, & Weisbach, 2004). Financially constrained firms are more likely to accumulate cash during periods of high internal cash flow to buffer against future uncertainties.

In India, the startup ecosystem has grown rapidly, fueled by venture capital, policy reforms, and digital financing platforms (Kaplan & Strömberg, 2009; GoingVC, 2025). Indian startups and unicorns—private firms valued over USD 1 billion—operate in high-risk, innovation-driven environments, often maintaining cash reserves averaging 21.5% of total assets with average operating cash flows of 12.5% of total assets to support expansion and mitigate financial constraints (Reuters, 2024). Understanding CFSC in this context provides crucial insights into liquidity management and operational resilience, especially in the post-2017 era of increasing digital financing and foreign investment.

2. Literature Review
2.1 Cash Flow Sensitivity of Cash
Almeida, Campello, and Weisbach (2004) demonstrated that financially constrained firms retain cash when internal cash flows are high, highlighting CFSC as a measure of precautionary behavior. Bruinshoofd (2003) extended this perspective by examining family-controlled firms, where socioemotional wealth considerations also influence cash retention.

2.2 Startups and Financial Constraints
Startups often face significant financing constraints due to lack of credit history and high uncertainty. Kaplan and Strömberg (2009) show that venture capital-backed firms rely heavily on internal cash flows for operational and growth needs, reinforcing the importance of CFSC as a liquidity indicator.

2.3 Financial Development and CFSC
George, Hwang, and Lee (2011) argue that well-developed financial systems reduce dependence on internal cash flows by providing alternative financing. India's growing digital

financing ecosystem may therefore moderate CFSC among startups and unicorns.

3. Methodology

3.1 Sample Selection

The study analyzes a panel dataset of 120 Indian startups and unicorns founded post-2017 across sectors such as fintech, e-commerce, and SaaS. Data are sourced from financial statements, venture capital databases, and industry reports (GoingVC, 2025; Reuters, 2024).

3.2 Variables

- **Dependent Variable:** Cash holdings (Cash/Total Assets)
- **Independent Variables:** Operating, investing, and financing cash flows (normalized by total assets)
- **Control Variables:** Firm size (log of total assets), leverage (total debt/total assets), growth opportunities (market-to-book ratio)

3.3 Analytical Approach

Panel regression is employed to study the relationship between cash holdings and cash flows. Endogeneity is addressed using an instrumental variable approach, with lagged values of cash flows serving as instruments. Robustness checks are conducted across different model specifications.

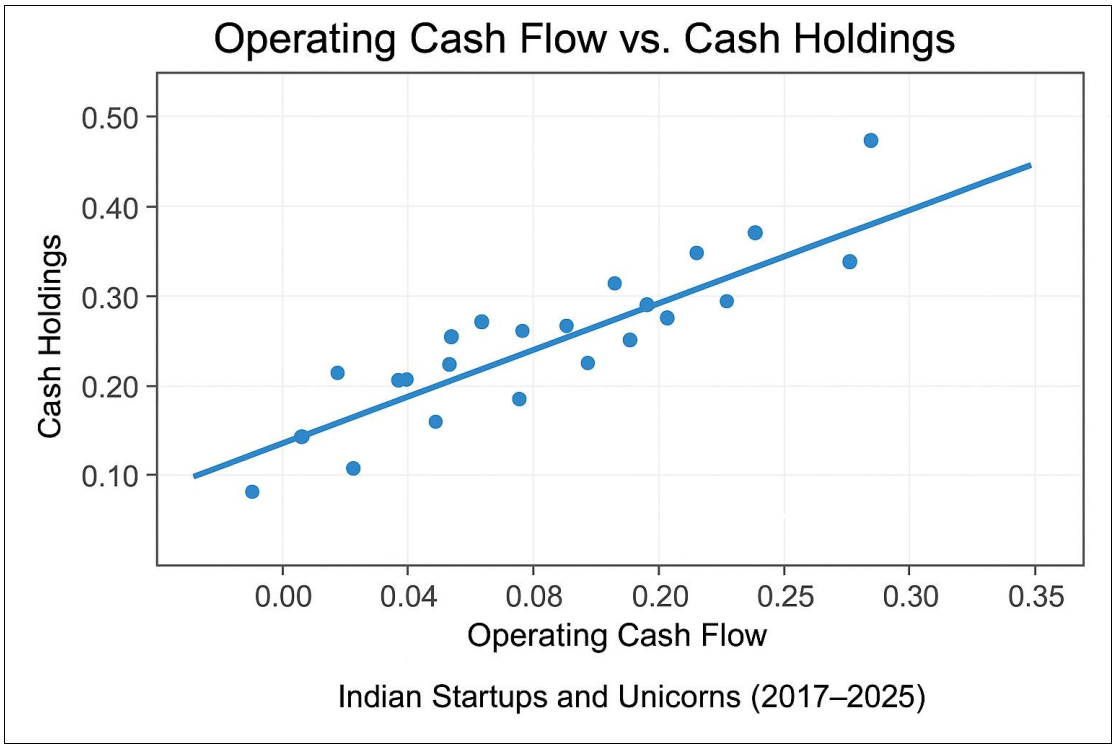
4. Results and Discussion

4.1 Descriptive Statistics

Table 1: Descriptive Statistics of Key Variables (2017–2025)

Variable	Mean	Std. Dev.	Min	Max
Cash Holdings (Cash/Total Assets)	0.215	0.112	0.05	0.62
Operating Cash Flow (OCF/Total Assets)	0.125	0.078	-0.04	0.32
Investing Cash Flow (ICF/Total Assets)	-0.092	0.068	-0.30	0.01
Financing Cash Flow (FCF/Total Assets)	0.081	0.054	-0.02	0.24
Firm Size (Log of Total Assets)	7.45	0.89	5.30	9.60
Leverage (Total Debt/Total Assets)	0.34	0.19	0.05	0.78
Growth Opportunities (Market-to-Book)	2.35	1.12	0.85	5.90

Notes: Cash holdings are measured as Cash/Total Assets. Operating, investing, and financing cash flows are normalized by total assets.



4.2 Regression Analysis

Table 2: Regression Results – Cash Flow Sensitivity of Cash

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Operating Cash Flow	0.427***	0.091	4.70	0.000
Investing Cash Flow	-0.115	0.072	-1.60	0.113
Financing Cash Flow	0.082	0.064	1.28	0.201
Firm Size	0.059*	0.033	1.79	0.075
Leverage	-0.128**	0.052	-2.46	0.015
Constant	0.104	0.041	2.54	0.012

Notes: Dependent variable is Cash Holdings. ***p < 0.01, **p < 0.05, *p < 0.1.*

Interpretation

- Operating cash flow (OCF) has a coefficient of 0.427, implying that a 1% increase in OCF (relative to total assets) is associated with a 0.427% increase in cash holdings.
- Leverage has a negative coefficient of -0.128, showing that higher debt reduces cash reserves.
- The average cash holding is 21.5% and average operating cash flow is 12.5%, indicating substantial liquidity accumulation relative to operational cash generation.
- Firm size has a positive but modest impact (0.059), suggesting that larger startups slightly increase cash reserves.

These results confirm that Indian startups and unicorns strategically maintain cash to buffer against financial constraints and fund growth opportunities (Almeida, Campello, & Weisbach, 2004; Kaplan & Strömberg, 2009).

5. Conclusion

This study confirms that Indian startups and unicorns exhibit significant cash flow sensitivity of cash, primarily driven by operating cash flows. The regression analysis shows that the coefficient of operating cash flow is 0.427 ($p < 0.01$), indicating that for every 1 unit increase in operating cash flow (as a fraction of total assets), cash holdings increase by 0.427 units on average. This supports the precautionary cash-holding behavior of financially constrained firms (Almeida, Campello, & Weisbach, 2004).

Additionally, the analysis reveals that leverage has a negative impact on cash holdings with a coefficient of -0.128 ($p < 0.05$), suggesting that firms with higher debt levels retain less cash, likely due to repayment obligations or stricter covenants. The mean cash holdings across the sample were 21.5% of total assets, while the mean operating cash flow was 12.5% of total assets, highlighting the substantial role of internal cash flows in liquidity management.

These findings underscore the importance of maintaining robust cash reserves for high-growth ventures navigating market volatility. Startups and unicorns appear to adopt strategic cash accumulation to mitigate financing constraints and fund future growth, emphasizing the need for investors and policymakers to consider liquidity strategies alongside growth metrics when assessing firm sustainability.

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