

The Prevalence of Long-Term Negative Free Cash Flow among Listed Companies: Evidence from WSE, Nasdaq, NYSE, and SSE

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Abstract

Financial markets rely on indicators that signal corporate health, among which free cash flow (FCF) is considered fundamental. Positive FCF is associated with financial resilience, while persistent negative FCF is often viewed as a warning sign. Understanding the scale of long-term negative FCF is therefore critical for valuation and risk assessment. Prior studies have examined short-term cash flow dynamics, generally assuming that sustained negative FCF is rare, but evidence on its long-term prevalence across markets remains limited. However, empirical evidence on multi-year patterns across diverse markets remains limited, leaving the long-term dimension underexplored. The unresolved question concerns how frequently companies report negative FCF for extended periods. If such cases are common, it challenges the premise that prolonged liquidity deficits threaten viability and calls for a reassessment of performance metrics. Addressing this issue matters for theory and practice: it clarifies whether negative FCF is a reliable distress signal or a context-dependent indicator and informs investor decision-making. This study responds by quantifying the phenomenon across four major stock exchanges: Warsaw Stock Exchange, Nasdaq, New York Stock Exchange, and Shanghai Stock Exchange over a ten-year horizon. The findings confirm that nearly one-quarter of analysed companies reported negative FCF for at least three consecutive years. This evidence advances scholarly understanding by reframing assumptions about cash flow as a universal predictor of corporate health and provides a basis for more nuanced approaches to valuation under conditions of sustained liquidity constraints.

Key words

free cash flow, long-term negative FCF, prevalence of long-term negative FCF, financial analysis, stock markets, corporate valuation, liquidity metrics, investment strategy

1. Theoretical background

1.1. Financial Performance and Market Valuation: Conceptual Foundations

The assessment of corporate performance is a cornerstone of financial analysis and investment decision-making. Financial performance reflects a company's ability to generate value through efficient resource allocation and sustainable operations. Recent evidence suggests that industry-specific factors and systemic shocks can significantly alter liquidity patterns, challenging the assumption that cash flow metrics behave uniformly across sectors [Magerakis, 2025, pp. 1-2]. Traditional measures such as net income and earnings per share provide insights into profitability, yet they often fail to capture liquidity dynamics that underpin a company's capacity to meet obligations and finance growth. This limitation has led to the increasing emphasis on cash flow indicators, which offer a more transparent view of actual cash movements within the enterprise [Ross, Westerfield and Jordan, 2008, p. 22-26].

Market valuation represents the external perspective on corporate worth. It is shaped by investor expectations, macroeconomic conditions, and firm-specific fundamentals. Among various valuation metrics, market capitalization remains the most widely used due to its simplicity and real-time availability. Calculated as the product of share price and the number of outstanding shares, market capitalization serves as a proxy for the aggregate market assessment of a company's future. While intuitive, this measure is inherently sensitive to market sentiment and may diverge from intrinsic value, particularly in periods of volatility or speculative behaviour [Fama, 1970, pp. 413-416].

The interplay between internal financial performance and external market valuation is central to understanding corporate dynamics. In theory, robust financial fundamentals should translate into higher market capitalization, as investors reward firms that demonstrate operational efficiency and liquidity strength [Brealey, Myers and Marcus, 2015, pp. 199-202]. Conversely, persistent weaknesses in cash generation are expected to erode market confidence over time. Nonlinear investment–cash flow patterns, including negative sensitivities at low internal funds, often reflect life-cycle dynamics rather than financing cost effects [Lawrenz and

Oberndorfer, 2023, pp. 484–486]. Empirical findings from companies during COVID-19 confirm that leverage, profitability, and capital intensity affect cash holdings differently across manufacturing, retail, transportation, and hospitality sectors [Magerakis, 2025, pp. 2-3]. This conceptual link underpins the rationale for examining cash flow measures, especially free cash flow as indicators of long-term viability and as potential drivers of market valuation. Establishing this relationship provides the foundation for exploring anomalies such as sustained negative free cash flow in publicly listed companies, which challenge conventional assumptions about financial health and market behaviour [Beneda, 2003, p. 251].

Cash flow statements complement traditional accrual-based measures by revealing the timing and magnitude of actual cash movements. Unlike net income, which can be distorted by accounting policies or non-cash items, cash flow indicators provide a clearer picture of liquidity and operational efficiency. This distinction is critical because firms may report profits while experiencing cash shortages, a condition that can lead to solvency risks if sustained over time [Świdorska and Więclaw, 2006, pp. 3-4].

Market capitalization, while widely used, should be interpreted alongside other valuation metrics to avoid misjudging intrinsic value. For instance, discounted cash flow models incorporate expected future cash generation, offering a more fundamental perspective on valuation. Nevertheless, the simplicity and immediacy of market capitalization make it indispensable for benchmarking and portfolio construction, even though it remains vulnerable to speculative pressures and macroeconomic shocks [Sierpińska and Wędzki, 2002, p. 37].

The interaction between financial fundamentals and market valuation is not purely mechanical. It is mediated by investor expectations and information asymmetry. Research on the real effects of financial markets demonstrates that valuation signals influence managerial decisions, including investment timing and capital structure adjustments. This feedback loop underscores the importance of reliable liquidity indicators, as misinterpretation can propagate inefficiencies across both corporate and market levels [Bond, Edmans and Goldstein, 2012, p. 340].

1.2. Free Cash Flow: Definition, Calculation, and Interpretation

Free cash flow (FCF) is widely recognized as a critical indicator of a company's financial flexibility and long-term viability. It represents the amount of cash generated by operating activities after deducting capital expenditures necessary to maintain and develop core business operations. Unlike accounting profit, which can be influenced by accruals and non-cash adjustments, FCF reflects actual liquidity

available for strategic purposes such as debt repayment, dividend distribution, or reinvestment [Kuciński and Byczkowska, 2018, pp. 86-87].

The most common approach to calculating free cash flow is based on operating cash flow reduced by capital expenditures, as expressed in the following formula: $FCF = \text{Cash Flow from Operations} - \text{Capital Expenditures}$ [Brealey, Myers and Marcus, 2015, p. 68]. This measure captures the residual cash after securing the continuity of operations, offering a realistic view of resources that can be allocated without jeopardizing the firm's productive capacity. Over time, numerous variations of FCF calculation have been proposed to incorporate additional factors such as working capital adjustments or discretionary spending [Bhandari and Adams, 2017, pp. 11-19]. However, all approaches share the fundamental principle of isolating cash available after essential investments, which explains why FCF is frequently used in valuation models and performance assessments despite its sensitivity to investment cycles and industry-specific capital intensity [Ross, Westerfield and Jordan, 2008, pp. 33-34; Brealey, Myers and Marcus, 2015, p. 68].

The interpretation of FCF values requires contextual analysis. Positive FCF generally signals that a company generates sufficient cash to cover investments and obligations, which is considered favourable for investors and creditors. Conversely, negative FCF indicates that operating cash inflows are insufficient to finance capital expenditures, potentially implying liquidity constraints or aggressive investment strategies. While short-term negative FCF may occur during periods of expansion or restructuring, its persistence over multiple years raises concerns about the sustainability of business models and the adequacy of financing structures [Ross, Westerfield and Jordan, 2008, pp. 33-34; Kuciński and Byczkowska, 2018, p. 90]. To operationalize this distinction, Table 1 presents typical configurations of negative free cash flow and their interpretation as either a warning signal or a strategic growth stage.

Tab. 1. Contextual Interpretation of Negative Free Cash Flow

Negative FCF Configuration	Interpretation
Negative FCF + weak liquidity + low interest coverage	Warning signal and high financial risk
Negative FCF + high leverage + declining revenues	Critical risk and potential distress
Negative FCF + strong liquidity + high capital expenditures (CapEx) in growth phase	Growth strategy and deliberate investment
Negative FCF + positive revenue trend + external financing secured	Expansion stage, acceptable if strategic

Source: own elaboration based on Beneda, 2003; Ross et al., 2008; Kuciński and Byczkowska, 2018; Suranta et al., 2023; Lawrenz and Oberndorfer, 2023.

Recent literature stresses that negative FCF should not be interpreted uniformly, when accompanied by weak liquidity and low interest coverage, it signals heightened financial risk, whereas in early life-cycle stages or under aggressive growth strategies it may represent a deliberate investment choice rather than distress [Lawrenz and Oberndorfer, 2023, pp. 483–518; Suranta et al., 2023, pp. 284–286].

Beyond its role as a liquidity measure, FCF serves as a proxy for managerial efficiency in capital allocation. Firms that consistently generate positive FCF demonstrate the ability to balance operational cash generation with investment needs, signalling disciplined financial management. Conversely, chronic negative FCF may indicate structural inefficiencies or reliance on external financing, which can elevate risk profiles and cost of capital [Sierpińska and Wędzki, 2002, p. 37]. The strategic implications of FCF extend to shareholder value creation. Positive FCF enables companies to pursue dividend policies, share repurchases, or debt reduction, all of which contribute to enhancing equity value. These channels illustrate why investors closely monitor FCF trends as part of fundamental analysis, particularly in volatile markets where earnings alone may not provide sufficient insight into liquidity resilience [Brealey, Myers and Marcus, 2015, pp. 199-202].

Industry characteristics also significantly influence FCF patterns. Capital-intensive sectors, such as utilities or manufacturing, often exhibit lower or negative FCF during investment cycles, whereas technology firms may sustain deficits due to aggressive growth strategies. This variability underscores the need for sector-adjusted benchmarks when interpreting FCF values in comparative analyses [Beneda, 2003, p. 251].

1.3. Long-Term Perspective in Financial Analysis

The concept of “long-term” in financial analysis is inherently relative and depends on the context of application [McClellan Financial Publications, 2020]. For short-term traders, a position held for several days may be considered long-term, whereas for institutional investors managing retirement portfolios, even a one-year horizon may appear insufficient. Regulatory frameworks provide more precise definitions: in corporate reporting, long-term liabilities and investments are classified as those exceeding twelve months [Wędzki, 2018, p. 9]. However, when assessing the persistence of financial phenomena such as negative free cash flow, a broader timeframe is required to capture structural trends rather than temporary fluctuations.

In the context of this study, long-term is defined as a period of at least three consecutive years. This threshold reflects the assumption that within such a horizon,

most strategic investments should be completed and their financing stabilized. It also minimizes the influence of short-lived anomalies caused by seasonal factors or isolated capital expenditures. By focusing on extended sequences of quarterly reports, the analysis aims to identify companies that consistently report negative free cash flow, signalling potential weaknesses in operational cash generation or aggressive investment policies sustained over time.

The significance of adopting a long-term perspective lies in its implications for risk assessment and valuation. While temporary negative FCF may be tolerated by investors during growth phases, prolonged deficits challenge the expectation that companies must eventually generate surplus cash to ensure solvency and shareholder returns. Persistent inability to achieve positive FCF raises questions about the sustainability of business models and the adequacy of financing strategies, making long-term analysis indispensable for understanding structural financial health [Ross, Westerfield and Jordan, 2008, pp. 33-34]. High free cash flow signals financial health, while persistent deficits combined with weak interest coverage strongly predict distress [Suranta et al., 2023, pp. 284-286].

Moreover, the interpretation of “long-term” should consider industry-specific investment cycles. Capital-intensive sectors often require multi-year expenditure programs, which can depress free cash flow for extended periods without necessarily indicating financial distress. Conversely, companies in technology or service industries may exhibit shorter investment horizons, making prolonged negative FCF a more concerning signal in these contexts [Beneda, 2003, p. 251]. This variability underscores the need for analysts to apply sector-adjusted benchmarks when evaluating liquidity trends over time.

Another dimension relates to macroeconomic conditions and regulatory environments. Economic downturns or policy-driven capital requirements can extend the duration of negative cash flow phases, even for fundamentally sound firms. Therefore, long-term analysis should integrate both firm-level and systemic factors to avoid misinterpretation of liquidity patterns [El-Wassal, 2013, p. 610]. Such a holistic approach enhances the reliability of conclusions drawn from multi-year cash flow data and supports more informed investment decisions.

1.4. Market Capitalization Context and its Limits for Interpreting Liquidity Signals

Market capitalization is one of the most widely applied indicators of corporate valuation in financial markets. It is calculated as the product of the current share price and the total number of outstanding shares, offering an intuitive and easily accessible measure of a company’s market worth. Unlike book value or discounted cash flow models, which require complex estimations and assumptions, market

capitalization reflects real-time investor sentiment and expectations based on publicly available information [Fama, 1970, pp. 413-416].

The simplicity of this metric explains its popularity among analysts and investors. It enables quick comparisons across firms and sectors, facilitating portfolio allocation and benchmarking. However, market capitalization is not without limitations. It is highly sensitive to fluctuations in share prices, which may be driven by factors unrelated to fundamental performance, such as speculative trading or macroeconomic shocks. Consequently, while market capitalization serves as a proxy for perceived corporate value, it does not necessarily correspond to intrinsic value derived from discounted future cash flows [Brealey, Myers and Marcus, 2015, pp. 199-202].

Despite these limitations, market capitalization remains a cornerstone of equity market analysis. It is frequently used to classify companies into size categories - large-cap, mid-cap, and small-cap, which influence risk profiles and investment strategies. Moreover, its responsiveness to new information aligns with the efficient market hypothesis, which posits that stock prices incorporate all publicly available data [Fama, 1970, pp. 413-416]. This theoretical foundation underscores the relevance of market capitalization in empirical research examining the relationship between financial fundamentals and market valuation.

Beyond its role as a comparative metric, market capitalization also serves as a signalling mechanism in capital markets. Companies with higher market capitalization often enjoy better access to financing and lower cost of capital, reinforcing their competitive position. This dynamic illustrates how valuation is not merely an outcome of performance but also a determinant of future strategic options, creating a feedback loop between market perception and corporate decision-making [Bond, Edmans and Goldstein, 2012, p. 340].

Furthermore, the interpretation of market capitalization should account for structural differences across industries and regions. In emerging markets, where liquidity and investor confidence may fluctuate, capitalization can be disproportionately influenced by macroeconomic conditions or regulatory changes. Conversely, in mature markets, valuation tends to reflect more stable expectations anchored in long-term fundamentals. These contextual factors highlight the need for caution when using market capitalization as a sole indicator of corporate value, particularly in cross-market comparisons [El-Wassal, 2013, p. 610].

1.5. Free Cash Flow as a Signal of Financial Health and Its Long-Term Persistence

The interpretation of free cash flow patterns, especially their long-term persistence, has long been a subject of interest in corporate finance theory..

Conventional models assume that firms generating positive FCF signal operational efficiency and financial stability, which should translate into higher market valuation. This expectation is grounded in the principle that surplus cash provides flexibility for dividend payments, debt reduction, and strategic investments, all of which enhance shareholder value [Ross, Westerfield and Jordan, 2008, pp. 33-34].

To formalize this relationship, analysts often employ the free cash flow yield (FCFY) indicator, calculated as the ratio of FCF to market capitalization. A higher FCFY suggests that a company's market value is supported by strong cash generation, whereas a low or negative FCFY may indicate overvaluation or liquidity constraints. Empirical observations from leading indices, such as the S&P 500, show that companies with robust FCF typically maintain stable or growing market capitalization, reinforcing the theoretical link between internal cash flows and external valuation [Brealey, Myers and Marcus, 2015, pp. 199-202].

However, this relationship is not absolute. Firms in high-growth sectors may report negative FCF for extended periods due to aggressive investment strategies, while their market capitalization continues to rise. Such cases challenge the assumption that cash flow performance and market value are tightly coupled, suggesting that investor expectations and perceived future potential can outweigh current liquidity metrics [Beneda, 2003, p. 251]. This divergence underscores the need for empirical research to determine whether prolonged negative FCF is an exception or a widespread phenomenon across different markets. Evidence shows liquidity and interest coverage reduce distress risk, while leverage and asset growth often lack explanatory power [Suranta et al., 2023, pp. 288-290]. Additional evidence shows that excess cash positively influences capital investment in the short term, while liquidity shortfalls increase default risk and market exit probability [Magerakis, 2025, pp. 18-20].

1.6. Empirical Evidence and Research Gaps

The relationship between free cash flow (and market capitalization) has long been a subject of interest in corporate finance theory. Conventional models assume that firms generating positive FCF signal operational efficiency and financial stability, which should translate into higher market valuation. This expectation is grounded in the principle that surplus cash provides flexibility for dividend payments, debt reduction, and strategic investments, all of which enhance shareholder value [Ross, Westerfield and Jordan, 2008, pp. 33-34].

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Moreover, the strength of the link between FCF and market capitalization is influenced by market efficiency and information asymmetry. In highly efficient markets, prices should reflect all available information, including cash flow trends, but behavioural factors and speculative dynamics often distort this alignment. Investors may prioritize growth narratives or intangible assets over short-term liquidity, creating valuation premiums even when free cash flow remains negative [Fama, 1970, pp. 413-416]. This complexity highlights the importance of integrating FCF analysis with broader valuation frameworks, such as discounted cash flow models, to capture both current liquidity and expected future performance.

Finally, the theoretical connection between FCF and market value has practical implications for corporate strategy. Positive FCF not only supports valuation but also enhances financial flexibility, enabling firms to pursue acquisitions, innovation, and shareholder payouts. Conversely, sustained negative FCF can constrain strategic options and increase dependence on external financing, which may elevate risk and cost of capital. Understanding these dynamics is essential for interpreting market signals and assessing whether valuation levels are justified by underlying cash flow fundamentals [Brealey, Myers and Marcus, 2015, pp. 199-202].

2. Research method

2.1. Research Objective and Hypothesis

The primary objective of this study is to examine the prevalence of long-term negative free cash flow (FCF) among publicly listed companies. This focus stems directly from the theoretical assumption that persistent inability to generate positive FCF undermines financial stability and should be rare in well-functioning markets

[Ross, Westerfield and Jordan, 2008, pp. 33-34]. However, anecdotal evidence and isolated cases suggest that companies may sustain negative FCF for extended periods without immediate market penalties [Beneda, 2003, p. 251]. This contradiction motivates the formulation of the following hypothesis:

H1: A substantial share of stock-listed companies report negative free cash flow results in the long term.

The hypothesis is grounded in the conceptual link between cash flow and corporate viability discussed in theory section. While theory predicts that negative FCF should be temporary, the lack of comprehensive empirical verification across multiple markets creates a research gap addressed by this study.

In addition to its theoretical relevance, the hypothesis carries practical implications for financial analysis and investment decision-making. If confirmed, it would challenge the conventional interpretation of negative FCF as a universal distress signal and highlight the need for more nuanced approaches that consider industry characteristics, firm life cycle, and market structure. Such findings could influence valuation models, credit risk assessments, and portfolio strategies, particularly in environments where growth-oriented firms dominate [Brealey, Myers and Marcus, 2015, pp.199-202].

Furthermore, testing this hypothesis contributes to the broader discourse on market efficiency and investor behaviour. Persistent negative FCF coexisting with stable or rising market capitalization would suggest that expectations about future performance can outweigh current liquidity constraints, reinforcing the role of behavioural factors and information asymmetry in valuation processes [Fama, 1970, pp. 413-416]. This perspective underscores the importance of empirical evidence in validating or refining theoretical assumptions that underpin corporate finance and investment practices.

2.2. Research Design

The study adopts a non-reactive research design based on document analysis, which is appropriate for investigating financial phenomena through existing corporate reports [Apanowicz, 2002, pp. 68-70]. This approach ensures objectivity and replicability by relying on standardized financial statements published by stock-listed companies. The analysis covers four major stock exchanges: Warsaw Stock Exchange (WSE), Nasdaq, New York Stock Exchange (NYSE), and Shanghai Stock Exchange (SSE), providing a comparative perspective across developed and emerging markets.

Document analysis as a methodological choice offers several advantages. It eliminates the risk of respondent bias inherent in survey-based approaches and

allows for the use of verified, audited data, which strengthens the reliability of findings. Moreover, the use of longitudinal datasets spanning a decade enables the identification of structural patterns rather than short-term anomalies, which is essential for testing the hypothesis on long-term negative free cash flow.

The design also incorporates principles of comparability and transparency. All data were sourced from publicly accessible repositories, ensuring that the research process can be replicated by other scholars. This aligns with best practices in empirical finance, where reproducibility and data integrity are critical for validating theoretical assumptions [Sierpińska and Wędzki, 2002, p. 37]. Additionally, the inclusion of multiple markets introduces heterogeneity in regulatory frameworks, industry composition, and investor behaviour, which enhances the generalizability of results and allows for cross-market comparisons.

Finally, the research design reflects a balance between depth and breadth. By focusing on quarterly reports, the study captures granular changes in cash flow dynamics, while the ten-year horizon provides a robust basis for assessing persistence. This dual perspective strengthens the explanatory power of the analysis and supports nuanced interpretations of liquidity trends in relation to market valuation [Brealey, Myers and Marcus, 2015, pp. 199-202].

2.3. Data Sources and Collection

Data were obtained from reputable financial information services that aggregate quarterly reports of listed companies:

- WSE: BiznesRadar.pl [BiznesRadar.pl, 2020];
- Nasdaq and NYSE: Stockrow.com [Stockrow.com, 2020];
- SSE: Yahoo Finance [Yahoo Finance, 2020].

These platforms deliver structured datasets including cash flow from operations, capital expenditures, and market capitalization, enabling calculation of free cash flow according to the formula presented in research design subsection [Brealey, Myers and Marcus, 2015, p. 68]. The collection process involved automated extraction of quarterly data for all eligible companies from Q1 2010 to Q4 2019, resulting in approximately 250040 reports for 6251 companies.

To ensure consistency and comparability, data were downloaded in standardized formats and verified against official exchange disclosures. This step minimized the risk of discrepancies arising from reporting delays or currency conversions. For companies listed on non-USD markets, values were recalculated into U.S. dollars using fixed exchange rates as of February 1, 2020, which allowed for uniform analysis across all markets [Świdorska and Więclaw, 2006, pp. 3-4]. Such

normalization is essential for cross-market studies, as differences in local currencies and inflation can distort liquidity indicators if left unadjusted.

The extraction process was supported by automated scripts to handle large datasets efficiently. These scripts applied predefined filters to exclude companies with incomplete reporting histories or missing key variables, such as operating cash flow or capital expenditures. This approach ensured that only firms meeting strict inclusion criteria were analysed, thereby enhancing the reliability of the results [Apanowicz, 2002, p. 89]. Additionally, the use of automated tools reduced human error and improved reproducibility, which is critical for empirical research in financial markets.

Finally, the choice of data sources reflects their credibility and widespread use among practitioners and academics. BiznesRadar.pl, Stockrow.com, and Yahoo Finance are recognized for providing accurate and timely financial information, which supports the validity of the study's findings. Their coverage of historical data over a decade allowed for robust longitudinal analysis, capturing structural trends rather than short-term fluctuations, a prerequisite for testing the hypothesis on long-term negative free cash flow.

2.4. Data Inclusion Criteria

To ensure consistency and reliability, companies were included in the analysis if they met the following conditions:

- Continuous listing on the respective exchange during the study period;
- Availability of quarterly reports containing both operating cash flow and capital expenditure data;
- No bankruptcy filings or regulatory delistings during the observation window.

These criteria align with best practices in longitudinal financial research and minimize distortions caused by incomplete reporting or extraordinary corporate events [Apanowicz, 2002, p. 89]. Applying strict eligibility rules is essential for maintaining the integrity of comparative studies, as missing data or irregular reporting can lead to biased estimates and misinterpretation of trends.

In addition, companies with significant corporate restructuring, mergers, or spin-offs during the observation period were excluded to avoid inconsistencies in financial continuity. Such events often introduce abrupt changes in cash flow patterns that do not reflect operational performance but rather accounting adjustments or one-time transactions. By filtering out these cases, the study focuses on companies whose financial trajectories provide meaningful insights into long-term liquidity dynamics.

Another important consideration was the completeness of historical data. Only companies with at least 40 quarterly reports covering the entire decade were retained, ensuring that the analysis captures sustained patterns rather than fragmented sequences. This approach strengthens the robustness of findings and supports the validity of conclusions drawn about persistent negative free cash flow.

Finally, the inclusion criteria were designed to balance representativeness and rigor. While excluding firms with incomplete data reduces sample size, it enhances comparability across markets and sectors. This trade-off reflects a methodological principle widely endorsed in empirical finance: prioritizing data quality over quantity to achieve reliable and actionable results [Sierpińska and Wędzki, 2002, p. 37].

2.5. Operationalization of “Long-Term Negative FCF”

For the purpose of the study, “long-term” has been defined as a minimum of 12 consecutive quarters (three years) of negative free cash flow, allowing for one isolated positive quarter within the sequence to avoid false negatives caused by reporting anomalies. This operationalization reflected the theoretical argument that structural trends, rather than short-term fluctuations, determine financial resilience [Ross, Westerfield, Jordan, 2008, pp. 33-34].

The choice of a three-year horizon is consistent with the notion that strategic investments and financing decisions typically unfold over multiple reporting cycles. Shorter periods could capture temporary liquidity constraints linked to seasonal factors or one-off capital expenditures, whereas a multi-year perspective provides a more reliable indicator of structural weaknesses or aggressive growth strategies. This threshold also aligns with common practices in financial analysis, where sustained patterns are distinguished from transient anomalies to improve predictive validity.

To enhance robustness, the study permitted a single positive quarter within the sequence. This tolerance accounts for irregularities such as timing differences in cash inflows or exceptional transactions that do not alter the underlying trend. By incorporating this flexibility, the operational definition avoids misclassification while preserving the integrity of the long-term criterion.

Finally, the operationalization acknowledged sectoral and macroeconomic influences. Industries with high capital intensity may exhibit prolonged negative FCF during expansion phases, while companies in technology-driven sectors could maintain deficits as part of deliberate growth strategies.

2.6. Analytical Tools and Techniques

Data processing was conducted using Microsoft Excel with a custom VBA script designed to:

- Identify sequences of consecutive negative FCF values,
- Aggregate periods meeting the ≥ 12 -quarter criterion,
- Generate summary statistics for each stock exchange.

This technique ensures systematic identification of long-term negative FCF patterns across large datasets and supports reproducibility of results. The use of automated scripts significantly reduces the risk of human error and enhances efficiency when handling thousands of records. Moreover, the algorithm incorporated logical checks to validate data integrity, such as verifying the presence of both operating cash flow and capital expenditure values before calculations. These safeguards ensured that only complete and accurate observations contributed to the final analysis, which is critical for empirical research in financial markets [Apanowicz, 2002, p. 89].

In addition to basic aggregation, the script generated descriptive statistics, including frequency distributions and median sequence lengths, providing deeper insights into the persistence of negative FCF across different markets. This functionality allowed for a more nuanced interpretation of results beyond simple prevalence rates, supporting the study's objective of identifying structural patterns rather than isolated anomalies [Sierpińska and Wędzki, 2002, p. 37].

2.7. Time and Place of Research

The empirical analysis was performed between March and April 2020 using digital resources accessible from Warsaw, Poland. The timeframe for data collection and processing spanned approximately 30 hours distributed over 32 days, reflecting the complexity of handling extensive datasets. This schedule accommodated the need for sequential data extraction to avoid overloading source platforms and ensured compliance with their technical limitations. The extended duration also allowed for iterative validation of extracted data, reinforcing the reliability of the dataset used for hypothesis testing.

2.8. Ethical and Methodological Considerations

The study relies exclusively on publicly available financial data, ensuring compliance with ethical standards and avoiding confidentiality breaches. Automated data extraction was conducted in accordance with the terms of service of the

respective platforms, and no actions were taken that could disrupt their functionality. Furthermore, the research design adhered to principles of transparency and reproducibility: all methodological steps, including data sources, inclusion criteria, and operational definitions, were documented to enable independent verification.

3. Research results

3.1. Prevalence of Long-Term Negative Free Cash Flow

The analysis revealed that long-term negative FCF is not an isolated phenomenon but occurs with notable frequency across all examined markets. Out of 6251 companies, 1516 reported negative FCF for at least three consecutive years, representing 24,3% of the total sample. This finding confirms the hypothesis that a substantial share of stock-listed companies experience prolonged liquidity deficits, challenging the assumption that negative FCF is merely a short-term anomaly [Beneda, 2003, p. 251].

The distribution of such cases varies significantly by market. The highest prevalence was observed on the Shanghai Stock Exchange, where 36,2% of companies reported extended negative FCF periods. The Warsaw Stock Exchange followed with 30,7%, while Nasdaq and NYSE exhibited lower shares of 23,0% and 14,3%, respectively. These differences may reflect variations in market maturity, regulatory environments, and industry composition. Emerging markets often exhibit higher incidence of negative FCF due to aggressive investment strategies and reliance on external financing, whereas mature markets tend to impose stricter liquidity discipline and investor scrutiny [El-Wassal, 2013, p. 610].

Additional analysis indicates that the length of negative FCF sequences also differs across exchanges. In SSE and WSE, multi-year deficits frequently exceed the minimum threshold, suggesting structural factors such as capital intensity and macroeconomic volatility. Conversely, in NYSE-listed companies, negative FCF episodes were generally shorter, consistent with stronger governance standards and more conservative financial management practices as outlined in the literature [Brealey, Myers and Marcus, 2015, pp. 199-202].

Tab. 2. Share of Companies with Long-Term Negative Free Cash Flow by Market

Stock Exchange	Companies Analyzed	Companies with ≥ 12 Quarters Negative FCF	Share of Total
WSE	410	126	30.7%
Nasdaq	2513	579	23.0%

NYSE	1805	259	14.3%
SSE	1523	552	36.2%
Total	6251	1516	24.3%

Source: own elaboration based on research performed.

3.2. Market-Specific Observations

The relatively high share of companies with prolonged negative FCF on SSE and WSE suggests structural factors influencing liquidity generation. In emerging markets, firms may engage in aggressive investment strategies financed through external capital, delaying the transition to positive cash flow. Such behaviour often reflects growth-oriented policies supported by macroeconomic conditions and government incentives, which prioritize expansion over immediate profitability [El-Wassal, 2013, p. 610].

Nasdaq's intermediate position among investigated stock exchanges reflects its concentration of technology and growth-oriented firms, which often prioritize expansion over immediate cash generation. These companies frequently reinvest operating cash flows into research and development or acquisitions, accepting temporary liquidity deficits as part of their strategic trajectory. This observation supports earlier theoretical claims that negative FCF does not necessarily imply financial distress in high-growth contexts [Beneda, 2003, p. 251]. It also illustrates the importance of considering sectoral composition when interpreting cash flow metrics, as technology-driven markets exhibit fundamentally different investment cycles compared to traditional industries.

3.3. Interpretation of Results

The empirical evidence confirms that long-term negative FCF is a widespread phenomenon, affecting nearly one-quarter of all analysed companies. This finding challenges the conventional assumption that persistent liquidity deficits are rare and indicative of imminent financial distress [Ross, Westerfield and Jordan, 2008, pp. 33-34]. Instead, the results suggest that market tolerance for negative FCF may be higher than anticipated, particularly in environments characterized by growth-oriented strategies or structural reliance on external financing.

The observed variation across markets underscores the importance of contextual factors in interpreting cash flow metrics. While negative FCF may signal risk in mature markets, it can coexist with expansion and valuation growth in emerging economies or technology-driven sectors. These insights highlight the need for

nuanced approaches to financial analysis that account for industry dynamics and regional characteristics. Analysts should complement FCF evaluation with additional indicators such as leverage ratios, investment intensity, and free cash flow yield to avoid misclassification of firms undergoing strategic growth phases [Brealey, Myers and Marcus, 2015, pp. 199-202].

Moreover, the findings raise questions about the predictive power of liquidity metrics in valuation models. If investors systematically discount short-term cash deficits in favour of long-term growth prospects, traditional frameworks may require recalibration to incorporate behavioural and expectation-driven components. This perspective aligns with the efficient market hypothesis, which assumes that prices reflect all available information, including forward-looking signals, but also acknowledges that market behaviour can deviate from purely rational patterns under conditions of uncertainty [Fama, 1970, pp. 413-416].

4. Discussion

4.1. Central findings

A key contribution of this study is the identification of long-term negative free cash flow as a recurring pattern across diverse markets, challenging its traditional interpretation as an exceptional anomaly. This complements earlier evidence on prevalence and underscores the need for nuanced interpretation. It opens an opportunity to re-examine how scholars and practitioners interpret cash flow-based signals. Canonical finance posits that a company must, over sufficiently long horizons, generate surplus cash to remain solvent and to reward providers of capital. Accordingly, persistent negative FCF is typically viewed as symptomatic of structural inefficiency or excessive investment outlays [Ross, Westerfield and Jordan, 2008, pp. 33-34]. Yet the observed prevalence indicates that markets may tolerate extended cash deficits more often than theory commonly assumes, especially when investors anticipate future cash generation capacity rather than require contemporaneous evidence of it [Brealey, Myers and Marcus, 2015, p. 199-202; Fama, 1970, p. 413-416]. Such tolerance aligns with life-cycle theory, young, growth-oriented companies sustain negative FCF without immediate valuation penalties [Lawrenz and Oberndorfer, 2023, pp. 493-495].

This divergence between theoretical expectations and empirical evidence suggests that valuation frameworks must incorporate behavioural and strategic dimensions. Investors may prioritize growth narratives and intangible assets over short-term liquidity, particularly in sectors where innovation and scalability

dominate competitive advantage. Consequently, negative FCF should not be interpreted in isolation but assessed alongside indicators such as leverage, revenue growth, and investment intensity to avoid misclassification of firms undergoing deliberate expansion phases. Liquidity and interest coverage are stronger predictors of resilience than leverage or earnings management [Suranta et al., 2023, pp. 289–291].

4.2. Mechanisms consistent with the prevalence of long-term negative FCF

FCF is, by construction, operating cash flow net of capital expenditures, periods of expansion therefore depress FCF even when operations are healthy [Brealey, Myers and Marcus, 2015, p. 68]. In growth stages of companies' development, negative FCF can persist as management prioritizes scale and capability building over short-term liquidity, a pattern well documented in valuation work on high-growth companies [Beneda, 2003, p. 251]. This mechanism rationalizes why prolonged negative FCF need not immediately imply distress, as it can reflect deliberate intertemporal trade-offs that postpone cash surpluses in exchange for future competitive advantage. Such strategies are particularly evident in technology-driven sectors, where reinvestment in research and development or acquisitions is critical for sustaining innovation.

Under the efficient market hypothesis, prices aggregate all publicly available information, including expectations about future cash flows [Fama, 1970, pp. 413-416]. If investors credit managerial narratives and credible investment roadmaps, current negative FCF may be capitalized as a benign stage of a value-creating trajectory. Put differently, market capitalization can remain resilient even rise despite cash deficits, when the expected discounted stream of future FCF remains favourable [Brealey, Myers and Marcus, 2015, pp. 199-202]. This dynamic underscores the role of forward-looking valuation models and highlights the limitations of static liquidity metrics in explaining market behaviour.

A second, complementary explanation is the disconnect between accrual earnings and cash movements. Reported profits may improve as receivables accrue or non-cash items (e.g., depreciation) shape income, while actual cash available for reinvestment declines. The three-statement perspective underscores that income statements do not substitute for cash flow statements in assessing short- to medium-term liquidity [Ross, Westerfield and Jordan, 2008, pp. 22-26, 32-34]. Where working capital dynamics are volatile, FCF can remain negative even when reported profitability appears adequate [Kuciński and Byczkowska, 2018, pp. 86-90]. This reinforces the importance of integrating cash flow analysis into comprehensive financial assessments.

4.3. Cross-market heterogeneity and structural context

The heterogeneous incidence of long-term negative FCF across exchanges is consistent with differences in market development, financing structures, and sectoral mix. In emerging or rapidly transforming markets, external financing often plays an outsized role in funding fixed investments, while listing cohorts may be tilted toward capital-intensive or high-growth industries, mechanically raising the likelihood of prolonged negative FCF [El-Wassal, 2013, p. 610; Kuciński and Byczkowska, 2018, pp. 87-90]. Conversely, more mature markets with stringent disclosure norms and seasoned investor bases may exert tighter discipline on liquidity management, reducing the share of firms that sustain long cash flow deficits without corrective action [Ross, Westerfield and Jordan, 2008, pp. 33-34; Brealey, Myers and Marcus, 2015, pp. 199-202].

Two additional structural features merit attention. First, industry capital intensity differs markedly across exchanges (e.g., a greater weight of technology on growth-oriented platforms vs. manufacturing and heavy industry elsewhere), which shapes capital expenditures burdens and, by extension, the cash conversion profile. Companies with volatile revenues invest more despite low cash flows, reinforcing life-cycle explanations over cost-revenue effects [Lawrenz and Oberndorfer, 2023, pp. 498-500]. This explains why technology firms often exhibit negative FCF during aggressive scaling phases, while industrial firms may experience similar patterns during modernization cycles [Beneda, 2003, p. 251]. Second, institutional evolution, including regulatory reforms, investor protection regimes, and market microstructure can affect companies' access to non-operational funding, enabling longer investment runways before FCF turns sustainably positive [El-Wassal, 2013, p. 610]. These contextual factors highlight the need for sector-adjusted benchmarks and macroeconomic considerations when interpreting liquidity trends across global markets.

Conclusions

The primary objective of this study was to determine the prevalence of long-term negative free cash flow among publicly listed companies. This goal was fully achieved through a comprehensive analysis of 6251 companies across four major stock exchanges over a ten-year period. The empirical results confirm the tested hypothesis (H1): a substantial share of companies report negative free cash flow for at least three consecutive years. Nearly one-quarter of all analysed firms met this criterion, demonstrating that the phenomenon is widespread rather than exceptional.

These findings have significant implications for both theory and practice. From a theoretical perspective, they challenge the traditional assumption that persistent negative free cash flow is rare and inherently indicative of financial distress. Instead, the evidence suggests that its interpretation may depend on contextual factors such as industry characteristics, firm life cycle, and market structure. This nuance calls for a re-evaluation of liquidity metrics within valuation models and risk assessment frameworks.

From a practical standpoint, the results indicate that investors and analysts should avoid simplistic screening based solely on the sign of free cash flow. More sophisticated approaches, incorporating trend analysis, sector benchmarks, and complementary indicators such as leverage and investment intensity, are necessary to distinguish between strategic investment phases and genuine liquidity risk. Such adjustments would improve decision-making in environments where growth-oriented strategies dominate.

Our findings complement evidence that prolonged negative FCF often coincides with life-cycle dynamics rather than signaling imminent distress, as younger firms sustain deficits while pursuing growth opportunities. Consistent with recent studies, liquidity and interest coverage emerge as stronger predictors of financial resilience than leverage or asset growth, reinforcing the need for multi-indicator approaches to distress assessment.

The study is not without limitations. The analysis covers only the pre-COVID period, which limits the ability to capture the effects of subsequent structural shifts. Future research should examine whether these patterns persist under post-COVID conditions, including ultra-low and later rising interest rates, pandemic-induced shocks, and the surge of growth-oriented issuers, as these factors may significantly reshape the relationship between free cash flow, risk, and valuation. The operational definition of “long-term” as twelve consecutive quarters, while robust, remains a methodological choice. Cross-market comparisons may also be influenced by sectoral composition and macroeconomic conditions. Furthermore, reliance on aggregated data sources introduces potential measurement inconsistencies that future research should address. Another limitation relates to the timing of the research. The empirical analysis was conducted in early 2020, prior to the global COVID-19 pandemic. This context may influence the interpretation of results in two ways. On one hand, the pre-pandemic period represents a relatively stable macroeconomic environment, which could be considered an advantage for isolating structural patterns in free cash flow without the distortions caused by crisis-driven volatility. On the other hand, the pandemic introduced unprecedented shocks to global markets, altering liquidity management practices, investment cycles, and risk

perceptions. Consequently, findings based on a decade of pre-COVID data may not fully capture behavioural and financial adjustments that emerged in the post-pandemic era. Future research should therefore validate whether the observed prevalence of long-term negative FCF persists under conditions shaped by systemic disruptions.

Further inquiry should explore industry-specific patterns, examine transition dynamics from negative to positive free cash flow, and incorporate qualitative research methods to understand managerial decision-making aspects during extended investment phases. These directions would enable to refine theoretical models and provide practitioners with more calibrated tools for interpreting multi-year cash deficits, ultimately contributing to a deeper understanding of financial resilience in global markets.

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Długoterminowe ujemne wolne przepływy pieniężne w spółkach giełdowych: wnioski z badania GPW, Nasdaq, NYSE i SSE

Abstrakt

Rynki finansowe opierają się na wskaźnikach sygnalizujących kondycję przedsiębiorstw, spośród których wolne przepływy pieniężne (FCF) uznawane są za kluczowe. Dodatkowo FCF kojarzone są z odpornością finansową, natomiast utrzymujące się ujemne FCF często postrzegane są jako sygnał ostrzegawczy. Zrozumienie skali długoterminowych ujemnych FCF jest zatem istotne dla wyceny przedsiębiorstw i oceny ryzyka inwestycyjnego. Dotychczasowe badania koncentrowały się na krótkoterminowej dynamice przepływów pieniężnych przyjmując, że trwałe ujemne FCF są rzadkością, natomiast dowody dotyczące ich długoterminowej skali na różnych rynkach są ograniczone. Podjęte zagadnienie badawcze dotyczy tego jak często przedsiębiorstwa, na przykładzie spółek notowanych na wybranych, międzynarodowych giełdach, wykazują ujemne wolne przepływy pieniężne przez dłuższy okres. Jeżeli takie przypadki są powszechne, podważa to założenie, że przedłużające się deficyty płynności finansowej zagrażają trwałości działalności przedsiębiorstw, co uzasadnia potrzebę rewizji miar oceny efektywności ich działalności. Badanie odpowiada na te zagadnienie, opierając się na danych z czterech giełd - Giełdy Papierów Wartościowych w Warszawie (GPW), Nasdaq, Nowojorskiej Giełdy Papierów Wartościowych (NYSE) oraz Szanghajskiej Giełdy Papierów Wartościowych (SSE) w horyzoncie dziesięcioletnim. Wyniki zrealizowanych badań wskazują, że niemal jedna czwarta włączonych do próby badawczej przedsiębiorstw wykazywała ujemne FCF przez co najmniej trzy kolejne lata. Zrealizowane badania poszerzają wiedzę naukową i rewidują założenia dotyczące wolnych przepływów pieniężnych jako uniwersalnego predyktora kondycji przedsiębiorstw. Wyniki badań stanowią podstawę dla bardziej kompleksowych, wielowymiarowych podejść do wyceny przedsiębiorstw w warunkach utrzymujących się ograniczeń ich płynności.

Słowa kluczowe

wolne przepływy pieniężne, długoterminowe ujemne wolne przepływy pieniężne, częstość występowania długoterminowo ujemnych wolnych przepływów pieniężnych, analiza finansowa, rynki papierów wartościowych, wycena przedsiębiorstwa, wskaźniki płynności, strategia inwestycyjna