International Journal of Entrepreneurship and Forensic Management Research

A MODERATING EFFECT OF INFLATION ON THE IMPACT OF CORPORATE OWNERSHIP STRUCTURE ON THE FINANCIAL RESILIENCE OF ZOMBIE FIRMS IN SUB-SAHARAN AFRICA

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DOI: https://doi.org/10.70382/nijefmr.v14i7.054

Abstract

This study looks at how inflation changes the way company ownership affects the financial strength of struggling companies in Nigeria, a major country in Sub-Saharan Africa. Using ideas from theories about company management and the economy, it asks whether managers owning shares and a few people owning large shares help these weak companies become stronger, as shown by the Price-to-Earnings (P/E) ratio, and how these links change when inflation is high. The study uses past records, analysing data from 20 chosen weak companies in Nigeria's manufacturing sector, over 2015–2024, totalling 120 company-year cases. Methods include basic descriptions, looking at relationships between numbers, and using a type of regression analysis that adds inflation as a factor to see if it changes other results. The findings show that only inflation strongly predicts financial strength (B = 12.589, p = 0.028), having a clear positive effect. Manager ownership (B = 2.502, p = 0.224) and concentrated ownership (B = 1.721, p = 0.199)

Introduction

Zombie firms' financial resilience depends on their ability to manage distress, stay open, and recover. Research shows these firms usually have low or negative earnings per share (EPS) and return on equity (ROE) because they generate insufficient profits (Ghoul et al., 2021). The Price-to-Earnings (P/E) ratio, often negative for unlisted zombie firms, can show market hope for future profits in public ones. If the P/E becomes stable or starts to rise, even if low, it may mean the firm is on a slow path to recovery. Good company management helps prevent firms from becoming zombies. Independent boards and shareholders can reduce the risk of a firm becoming

also have positive effects, but these are not significant. Inflation's moderating effect is partly supported: the combined results for both ownership types are negative (MOWN×INFL: B = -0.158, p = 0.194; CONC×INFL: B = -0.125, p = 0.119), meaning high inflation can weaken any benefits from concentrated ownership, though these aren't strong findings. The overall model explains little of what affects the companies' market values (R^2 = 0.085), so there are other important factors not studied here. The study finds that in Nigeria's unpredictable economy, the market's views about the financial strength of struggling companies are mostly shaped by inflation, more than by who owns the company. Standard ways of running companies are less useful in this situation, showing that companies need to adapt their strategies and policies to this context. The study adds to the limited research on weak companies in Africa and advises managers, investors, and policymakers working in high-inflation countries. It makes suggestions for better company management when the economy is stressed and points out future research areas.

KEYWORDS: Concentrated Ownership, Financial Resilience, Inflation, Managerial Ownership, Ownership Structure, Zombie Firms

a zombie by keeping finances in check and driving necessary changes (Brahmana & Setiawan, 2025). Economic factors like inflation also affect these dynamics. When inflation is high, debt is worth less, but loans become more expensive, which can make problems worse for zombie firms (Cizkowicz et al., 2023).

The unique financial and regulatory landscape of Sub-Saharan Africa provides fertile ground for the persistence of zombie firms. Sub-Saharan Africa often has young financial markets, weak rules, and faces a lot of economic problems, all making it easier for struggling companies to stay around (Garcia-Merino et al., 2025). Research is starting to look at these companies in Africa. In Nigeria, Tomi et al. (2020) show that bad loans in banks help weak companies keep going. Naimo and Ogbeide (2022) studied what causes these firms in Nigeria and their role in the country's growth, while Omoruyi and Osariemen (2022) found such companies in Nigeria's insurance sector. Vercueil et al. (2023) talked about the rules for companies in trouble in South Africa, and Dzingirai (2025) found similar companies on Zimbabwe's Stock Exchange.

Research on zombie firms in Sub-Saharan Africa is limited but shows their growing importance amidst constant economic ups and downs and weak local institutions. Studies in Nigeria (Tomi et al., 2020; Anyanwu et al., 2024) and South Africa (Vercueil et al., 2023) point to zombie firms in areas like banking and insurance, fueled by unpaid loans, gaps in rules, and weak systems for handling failing businesses. For example, Tomi et al. (2020) found that unpaid loans hurt Nigerian banks, which, in turn, keep failing businesses alive by not enforcing strict repayment. Likewise, Vercueil et al. (2023) found

that South Africa's weak economy, made worse by COVID-19, led to more zombie firms because laws for dealing with business failure are not strict enough.

Ownership structure is a central determinant of zombie firm resilience. Ownership structure, including the concentration of ownership, the presence of institutional or state ownership, and foreign ownership, can significantly influence firm behaviour. For instance, studies indicate that non-state-owned shareholders can reduce zombification (Yin & Cao, 2024), while foreign ownership might impact a firm's transition between healthy and zombie status (Kitajima, 2025). The type and concentration of ownership can dictate the firm's access to finance, its willingness to restructure, and its overall strategic direction, thereby affecting its financial resilience. Ownership structure, such as concentrated versus dispersed ownership, affects accountability and resource allocation.

Inflation's role as a moderating variable is critical in understanding the interplay between ownership structure and zombie firm resilience. The existing empirical discourse on zombie firms frequently attributes their rise and persistence to periods of low interest rates, as evidenced by studies from Europe (Cella, 2020; Berling, 2021) and Central and Eastern Europe (Cizkowicz et al., 2023). This prevailing view suggests that cheap credit allows inefficient firms to roll over debt indefinitely. However, while these studies acknowledge the impact of monetary policy, they do not typically extend to analysing how a fluctuating or high inflationary environment might moderate the link between corporate governance and a zombie firm's financial resilience. Cizkowicz et al. (2023) explicitly note this gap by stating the absence of analysis on "the economic effects of inflation on individual countries and their effect on interest rates." Inflation can exert a dual influence: it can erode the real value of a firm's nominal debt, potentially alleviating the burden for highly leveraged zombie firms. Conversely, it can also drive up operational costs, raw material prices, and potentially future financing costs if central banks respond by raising interest rates, further squeezing an already fragile entity. In such an environment, the quality of a zombie firm's corporate governance becomes paramount. A well-governed zombie firm might be better equipped to implement strategies such as effective cost controls, judicious pricing adjustments, or strategic asset management to mitigate inflationary pressures, thereby bolstering its financial resilience.

The acute vulnerability of Sub-Saharan Africa magnifies the urgency of examining zombie firms within its distinctive economic context. The problem is especially severe in Sub-Saharan Africa due to high inflation, weak regulation, and governance challenges (World Bank, 2023). Studies show that zombie firms survive by forbearance and tend to have poor financial metrics, like low earnings per share and high debt-to-equity ratios, leading to weak resilience (Ghoul et al., 2021). In developed markets, Acharya et al. (2022) found that undercapitalised banks worsen zombification—a problem also present in African banking, where non-performing loans keep distressed firms afloat (Tomi et al., 2020). Ownership diversity in corporate governance reduces zombification by improving oversight. However, its effectiveness under inflation remains underexplored (Ofori-Sasu et al., 2022).

While the global phenomenon of zombie firms has garnered significant attention due to its pervasive negative impacts on productivity and resource allocation (Adalet McGowan et al., 2018), its specific manifestation and the effectiveness of mitigation strategies within the unique economic context of Sub-Saharan Africa (SSA) remain critically under-examined. In Nigeria, for instance, empirical evidence confirms the presence of zombie firms and their implications for the financial sector and economic growth, with studies highlighting issues such as non-performing loans (Tomi et al., 2020), their existence and determinants (Naimo & Ogbeide, 2022), identification within specific sectors like insurance (Omoruyi & Osariemen, 2022), and their relationship with liquidity management (Anyanwu & Ihejirika, 2024) and capital structure (Akwarandu et al., 2024; Anyanwu et al., 2024). Similar concerns are echoed across the region, with discussions on legal frameworks in South Africa (Vercueil et al., 2023), broad country-level analyses in Sierra Leone (Garcia-Merino et al., 2025), and observations on stock exchanges in Zimbabwe (Dzingirai, 2025). However, a significant problem persists: these regional studies predominantly focus on the identification, prevalence, or broad macroeconomic consequences of zombie firms, rather than delving into the granular mechanisms influencing their financial resilience and their capacity to withstand and recover from financial shocks.

Specifically, there is a pronounced knowledge void concerning the precise impact of ownership structure on the financial resilience of firms already in a zombie state within SSA. While corporate governance is universally acknowledged as crucial for organisational performance and stability (Shleifer & Vishny, 1997), its specific role in enabling or hindering the financial resilience of zombie firms, which are inherently distressed and prone to inefficiencies, is largely underexplored in the African context. Existing governance studies, even those touching on zombie firms, often focus on their prevention or exit mechanisms in developed economies (Brahmana & Setiawan, 2025; Veganzones & Severin, 2024), without providing insights relevant to the unique operational challenges and institutional environments faced by zombie firms in SSA.

In Nigeria, zombie firms are prevalent in sectors like banking and insurance, sustained by non-performing loans and regulatory gaps (Anyanwu et al., 2024). Tomi et al. (2020) found that non-performing loans significantly impair bank performance, indirectly supporting zombie firms through forbearance, which negatively affects financial metrics like earnings per share and debt-to-equity ratios. Similarly, Anyanwu et al. (2024) demonstrated that high debt-to-equity ratios in Nigerian non-financial firms correlate with zombie status, driven by poor governance practices such as weak board oversight. Across Sub-Saharan Africa, studies like Vercueil et al. (2023) in South Africa highlight how weak insolvency frameworks sustain zombie firms, reducing financial resilience by locking resources in unproductive ventures. Corporate governance mechanisms, such as board independence and audit quality, can improve resilience by enhancing transparency and strategic decision-making, as noted by Ofori-Sasu et al. (2022), but their effectiveness in Nigeria and the broader region is challenged by institutional weaknesses.

Inflation, a persistent issue in Sub-Saharan Africa, particularly in Nigeria, where rates reached 34.2% in mid-2024 (National Bureau of Statistics, 2024), increases borrowing costs and operational expenses, potentially diminishing the impact of governance structures on zombie firm resilience. While global studies, such as Cizkowicz et al. (2023), suggest that macroeconomic factors like low interest rates contribute to zombification, the specific role of inflation as a moderator in the relationship between governance and resilience remains underexplored in Sub-Saharan Africa. In Nigeria, Dzingirai (2025) notes that zombie firms exacerbate economic inefficiencies, but the study does not address how inflation interacts with governance mechanisms. The lack of research integrating inflation's moderating effect on the relationship between corporate governance structure and the financial resilience of zombie firms in Sub-Saharan Africa, particularly Nigeria, represents a critical gap. This study aims to address this problem by examining how inflation moderates the impact of corporate governance structure on the financial resilience of zombie firms in Sub-Saharan Africa, with a focus on Nigeria, to inform policy and enhance economic efficiency.

Despite extensive global research, a critical gap exists in understanding how inflation moderates the relationship between ownership structures and the financial resilience of zombie firms, particularly in Sub-Saharan Africa. Inflation, averaging 10–20% in countries like Nigeria, increases borrowing costs and operational expenses, potentially diminishing the effectiveness of governance mechanisms like audit quality or board independence in fostering resilience (World Bank, 2023; Munoz-Izquierdo et al., 2024). The lack of studies integrating these factors in the Sub-Saharan African context, where economic volatility amplifies zombie firm challenges, underscores the need for this research. This study aims to address this problem by examining how inflation moderates the impact of ownership structure on the financial resilience of zombie firms in Sub-Saharan Africa, providing insights to inform policy and enhance economic efficiency. The specific objectives of this study shall be;

1. To evaluate the impact of Managerial ownership on the price-earnings (P/E) ratio of Zombie Firms in Nigeria
2. To determine the impact of concentrated ownership on the price-earnings (P/E) ratio of Zombie Firms in Nigeria
3. To examine the moderating effect of Inflation on the impact of Ownership structure on the Financial Resilience of Zombie Firms in Nigeria.

Financial Resilience

Systemic applications extend financial resilience to markets and economies. Adrian et al. (2019) define it as the financial system's ability to absorb shocks without widespread disruption, using stress tests and capital adequacy ratios. In disaster risk management, the OECD (2018) frames financial resilience as building buffers against natural disasters through insurance and fiscal policies. These studies often employ quantitative measures like liquidity ratios and volatility indices to operationalise resilience, highlighting its role in preventing cascading failures. Across these domains, financial resilience is not static; it

involves proactive strategies (e.g., diversification) and reactive capabilities (e.g., access to credit), as synthesised in a systematic review by Kass-Hanna et al. (2022), which identifies common antecedents like financial literacy and consequences like reduced vulnerability.

Building on the literature, this study defines financial resilience as a firm's dynamic capacity to maintain operational stability, manage leverage, and generate sustainable returns amidst financial distress, particularly in the face of macroeconomic pressures like inflation. This definition integrates elements from household and corporate perspectives—coping and recovery—while tailoring it to zombie firms, emphasising measurable outcomes such as profitability and solvency. Unlike broader definitions focused on systemic stability (e.g., Adrian et al., 2019), this conceptualisation prioritises firm-level metrics, acknowledging zombie firms' unique context of artificial sustenance. It also incorporates inflation's moderating role, recognising how rising prices can erode real earnings and amplify debt burdens, as seen in emerging economy studies (Shen et al., 2023).

In past empirical studies, financial resilience has been used in various ways, often measured through proxies that reflect a firm's financial health and stability. The provided file offers several examples, though they may not explicitly use the term "financial resilience." For instance, Andrews and Petroulakis (2019), in their study on European zombie firms, investigated how these firms are connected to weak banks, implying that the zombie firms' persistence (a form of resilience) is enabled by external forbearance. The underlying metrics used likely included interest coverage ratios and debt-to-income measures to identify the firms' distressed financial state. Similarly, Tomi et al. (2020) focused on the relationship between non-performing loans and the performance of Nigerian banks. While not directly measuring firm-level resilience, their study's findings on the long-run significant relationship between these variables indirectly speak to the fragility of the financial system and the resilience (or lack thereof) of the firms reliant on these loans for survival.

Determinants and Consequences of Zombie Firms

The emergence and persistence of zombie firms are driven by a confluence of macroeconomic, institutional, and firm-level factors. A primary determinant identified in the global literature is an environment of low interest rates. As documented by Cizkowicz et al. (2023) and Cella (2020), periods of low interest rates make it cheaper for inefficient firms to service their debt, allowing them to roll over loans and avoid bankruptcy. This "cheap credit" enables them to postpone necessary restructuring or exit from the market. Another significant determinant is bank forbearance, which refers to banks continuing to extend credit to unviable firms to avoid realising loan losses on their balance sheets (Andrews & Petroulakis, 2019). This creates a cycle where weak banks support weak firms, preventing the necessary "creative destruction" that drives a healthy economy. Banerjee and Hofmann (2022) argue that post-global financial crisis (GFC) policies, including quantitative easing, have inadvertently sustained zombies by reducing borrowing costs,

leading to a rise in their prevalence across advanced economies. In empirical terms, their analysis of 14 OECD countries shows that a 1% drop in interest rates correlates with a 0.5% increase in zombie firm shares, as banks forbear on loans to avoid recognising losses.

At the institutional level, weak insolvency regimes and government subsidies or bailouts also play a crucial role. When bankruptcy laws are inefficient or politically influenced, they can make it difficult to liquidate failed firms, enabling them to linger. Government support, often provided to large employers to prevent job losses, can inadvertently sustain zombie firms, as highlighted in studies on European firms (Storz et al., 2017). These external determinants, while powerful, are not the full story. The provided file also hints at firm-level determinants, such as non-performing loans, as shown in the Nigerian context by Tomi et al. (2020), which points to internal financial fragility as a key precursor to zombification.

Institutional weaknesses, particularly in banking and insolvency regimes, further facilitate zombification. Weak banks, burdened by non-performing loans (NPLs), often engage in "evergreening", rolling over loans to distressed borrowers to mask balance sheet issues. Acharya et al. (2020) demonstrate this in European contexts, where undercapitalised banks extend credit to zombies, delaying necessary restructurings. Similarly, cultural and regulatory factors play a role; in Japan, strong firm-bank relationships and aversion to bankruptcy have historically perpetuated zombies (Caballero et al., 2008). The authors' seminal study quantifies how such forbearance reduced productivity growth by 1% annually during the 1990s.

Government interventions, including subsidies and bailouts, also determine zombie persistence, especially in emerging markets. In China, state-owned enterprises often receive preferential funding, distorting competition (Shen et al., 2023). A study by Tan et al. (2024) finds that fiscal subsidies extend zombie survival by 20-30%, as they reduce exit probabilities without improving efficiency. In Sub-Saharan Africa, similar dynamics are evident, albeit less documented. Tomi et al. (2020) highlight how NPLs in Nigerian banks sustain zombies in the deposit money market, driven by regulatory forbearance and weak enforcement. Vercueil et al. (2023) extend this to South Africa, where insolvency laws post-COVID-19 allowed distressed firms to linger, amplified by economic fragility.

Corporate governance structures are intrinsic determinants, as weak oversight enables mismanagement and delays corrective actions. Concentrated ownership and passive boards often prioritise short-term survival over long-term viability, leading to higher zombification risks (Brahmana and Setiawan, 2025). In Sub-Saharan Africa, Ofori-Sasu et al. (2022) note that poor institutional quality moderates governance effectiveness, with weak audit quality failing to detect distress signals early. Inflation exacerbates these determinants; high inflation erodes real debt but increases nominal costs, making zombies more dependent on governance for resilience (Cizkowicz et al., 2023). In SSA, where inflation often stems from currency depreciation and supply shocks, it interacts with governance deficiencies to prolong zombification, as seen in Zimbabwe's hyperinflationary episodes (Dzingirai, 2025).

The consequences of zombie firms are profound, extending beyond individual entities to systemic economic distortions. Primarily, zombies stifle productivity growth by misallocating resources; capital and labour trapped in inefficient firms prevent reallocation to high-potential enterprises. McGowan et al. (2018) quantify this in OECD countries, finding that a 1% increase in zombie share reduces multi-factor productivity growth by 0.2-0.3%. This "congestion effect" crowds out healthy firms from credit markets, as banks prioritise existing loans over new investments (Banerjee and Hofmann, 2022). In empirical analyses, the authors show that non-zombie firms in zombie-dominated industries experience 10-15% lower investment and employment growth.

Ownership Structure and Financial Resilience

Ownership structure refers to the allocation of equity ownership among shareholders and the resulting control dynamics within a firm. It is typically categorised into concentrated ownership, where a small group of shareholders (e.g., families, institutions, or the state) holds significant stakes, and dispersed ownership, where equity is spread across numerous shareholders, often seen in publicly listed firms. According to agency theory, ownership structure influences governance by aligning or misaligning the interests of shareholders and managers, with concentrated ownership often enhancing monitoring but risking entrenchment. La Porta et al. (1999) highlight that concentrated ownership is prevalent in emerging markets, where family firms or state entities dominate, while dispersed ownership is more common in Anglo-Saxon economies with strong legal protections.

Key attributes of ownership structure include the identity of owners (e.g., institutional, family, state), the degree of concentration, and the presence of blockholder shareholders owning significant stakes (e.g., 5% or more). Institutional ownership, for instance, is associated with active monitoring, as pension funds or hedge funds push for performance-oriented strategies. Family ownership, common in Sub-Saharan Africa, can foster long-term commitment but may prioritise family interests over minority shareholders. State ownership, prevalent in sectors like energy or banking, often introduces political influences, potentially distorting efficiency. The structure also evolves with regulatory changes, such as listing requirements on stock exchanges, which encourage transparency and broader ownership.

The ownership structure of a firm is a fundamental component of its corporate governance. It significantly influences a firm's strategic decisions, its risk-taking behaviour, and, crucially, its financial resilience. In general, a firm's ownership structure can either act as a powerful monitoring mechanism or, conversely, as a source of agency problems that could compromise its financial health. Concentrated ownership, where a single shareholder or a small group holds a majority stake, can be a double-edged sword. On one hand, it can lead to more effective monitoring of management, as the large shareholder has both the incentive and the power to ensure management's actions align with the firm's best interests. This can lead to more prudent financial management and, consequently, greater resilience. However, concentrated ownership can also give rise to

the "expropriation of minority shareholders," where the controlling owner makes decisions that benefit themselves at the expense of other investors, potentially weakening the firm's overall financial position.

Conversely, dispersed ownership, where a company is owned by a large number of small shareholders, can lead to a different set of challenges. In such a structure, no single shareholder has enough incentive to monitor management effectively, a phenomenon known as the "free-rider problem." This can allow management to pursue self-serving objectives, leading to inefficient resource allocation and poor financial performance, which severely undermines a firm's financial resilience.

Furthermore, the type of ownership is a critical factor. For instance, state ownership, common in many Sub-Saharan African economies, often comes with a different set of incentives. State-owned firms may be kept afloat for political or social reasons (e.g., to maintain employment), regardless of their economic performance. This can create "zombie" conditions, as the firm's survival is not tied to its financial resilience but to state support. A study by Yin and Cao (2024) in China found that mixed-ownership reforms, which increase non-state ownership, can help reduce the prevalence of zombie firms, suggesting that private ownership may promote more disciplined financial behaviour. Similarly, the presence of foreign ownership might introduce new governance standards and access to capital that could improve a firm's financial resilience (Kitajima, 2025).

The interplay between ownership structure and financial resilience is rooted in how ownership influences strategic decisions, resource allocation, and risk management. Concentrated ownership can enhance financial resilience by enabling swift decision-making and long-term investment, as blockholders prioritise firm survival. For instance, family-owned firms often exhibit resilience through conservative financial policies, maintaining lower debt-to-equity ratios to avoid external pressures. However, concentrated ownership may also undermine resilience if dominant shareholders engage in tunnelling—extracting resources for personal gain—leading to higher leverage and reduced EPS.

Dispersed ownership, conversely, fosters resilience through market discipline, as diverse shareholders demand transparency and performance, improving metrics like ROE and P/E ratio. Institutional ownership strengthens resilience by enforcing prudent financial strategies; a study by Aggarwal et al. (2005) found that institutional investors reduce firm risk by advocating for lower leverage, enhancing financial stability. However, dispersed ownership can lead to coordination challenges, delaying responses to crises and weakening resilience.

In Sub-Saharan Africa, ownership structure significantly impacts zombie firms' financial resilience. Concentrated ownership, often by families or state entities, sustains zombies through forbearance, as seen in Nigeria, where high debt-to-equity ratios correlate with zombie status due to lax oversight. Inflation, a prevalent issue in the region, moderates this relationship by increasing operational costs and debt burdens, challenging resilience unless ownership structures enforce robust governance. Effective ownership structures,

such as those with active institutional investors, can enhance resilience by pushing for restructuring, improving EPS and ROE.

Moderating Effect of Inflation on the Impact of Ownership Structure on the Financial Resilience of Zombie Firms

Zombie firms, by their nature, operate on the brink of insolvency, making governance critical for restructuring or exit strategies (Caballero et al., 2008). Inflation, particularly in volatile regions like Sub-Saharan Africa, where rates often exceed 10–20% (e.g., Nigeria's 34.2% in 2024), increases operational costs and nominal debt burdens, challenging governance-driven resilience (World Bank, 2023; National Bureau of Statistics, 2024). For instance, high inflation erodes real earnings, reducing EPS and P/E ratios, while increasing borrowing costs, which elevates debt-to-equity ratios (Cizkowicz et al., 2023). Governance mechanisms, such as independent boards or high-quality audits, can theoretically counteract these pressures by improving transparency and strategic oversight, but their efficacy may diminish under high inflation, necessitating a moderating effect analysis (Ofori-Sasu et al., 2022).

Inflation raises uncertainty about input costs, output prices, and margins, uncertainty that empirical work now measures directly at the firm level. Using the UK Decision Maker Panel, Yotzov, Bunn, Bloom, Mizen, and Thwaites (2023) show that firms facing greater inflation uncertainty make larger pricing errors and exhibit weaker performance, with the burden heavier for smaller, goods-sector firms (Yotzov et al., 2023). In such environments, even well-designed governance can struggle to produce timely, accurate investment and financing choices; conversely, weak governance is punished more severely as mispricing and mistiming compound. At the macro-financial margin, high inflation (and the policy tightening it triggers) lifts corporate bond yields and widens credit spreads, making refinancing costlier especially for highly leveraged or distressed firms (IMF, 2022). That pushes borderline firms toward "zombie" status and tests the quality of oversight, risk controls, and disclosure. These dynamics are documented globally and resonate in emerging and frontier markets, where external financing is more sensitive to global conditions (Hardy, 2024).

Ownership structure, blockholder monitoring, managerial ownership, family versus dispersed equity, and creditor influence affect both tolerance for underperformance and the appetite to restructure zombies. In tighter, inflationary conditions, creditors and controlling owners confront sharper trade-offs: roll over debt and risk value erosion, or restructure and crystallise losses. Studies in emerging markets show that governance, capital structure, and performance are dynamically interlinked, with feedback particularly salient under shocks (Ronoowah & Seetanah, 2023). Where inflation compresses real cash flows and raises discount rates, short-horizon or conflicted owners may prefer continuation (evergreening), while engaged blockholders can push for deleveraging, asset sales, or management changes that restore resilience. Effective ownership discipline, therefore, becomes more, not less, valuable when inflation is high and financing windows narrow.

Empirical studies provide insights into the moderating effect of inflation on governance and resilience, though Sub-Saharan African contexts are underexplored. Globally, Banerjee and Hofmann (2022) found that zombie firms' persistence is linked to weak governance and lenient monetary policies, with low interest rates reducing pressure on debt metrics but not addressing underlying inefficiencies. In high-inflation settings, Cizkowicz et al. (2023) observed that rising costs weaken firms' financial metrics, particularly EPS and ROE, suggesting that governance mechanisms like board oversight struggle to maintain resilience under inflationary pressures. Their study in Europe showed that a 5% increase in inflation correlates with a 10% rise in zombie firm distress, as nominal debt burdens grow.

In Sub-Saharan Africa, studies indirectly address this moderation. Ofori-Sasu et al. (2022) found that governance structures, such as board independence, improve firm performance (measured by ROE) in low-institutional-quality settings, but macroeconomic volatility, including inflation, reduces their effectiveness. In Nigeria, Anyanwu et al. (2024) linked weak governance to zombie firm persistence, with high debt-to-equity ratios exacerbated by inflation rates reaching 34.2% in 2024 (National Bureau of Statistics, 2024). Audit quality, a key governance mechanism, is critical for resilience, as Munoz-Izquierdo et al. (2024) showed that expanded audit disclosures identify zombie firm risks, enabling corrective actions that improve EPS. However, high inflation erodes these gains by increasing financial opacity, particularly in weakly regulated markets (Tomi et al., 2020).

The moderating effect of inflation on the impact of ownership structure on the financial resilience of zombie firms in Sub-Saharan Africa has profound implications. Zombie firms, prevalent in sectors like banking and manufacturing, rely on governance mechanisms to enhance resilience through restructuring or improved financial metrics (Tomi et al., 2020). Board independence can drive strategic decisions to reduce debt-to-equity ratios, while audit quality ensures transparency in reporting EPS and P/E ratios (Munoz-Izquierdo et al., 2024). However, high inflation, as seen in Nigeria and Zimbabwe, increases costs and debt servicing challenges, weakening these mechanisms' effectiveness (World Bank, 2023).

Inflation raises price/earnings volatility and forecasting errors (Yotzov et al., 2023). High-quality governance filters noise and enforces timely adjustments; weak governance lets mispricing persist, so the slope of governance resilience steepens with inflation. Tight monetary stances that accompany inflation lift funding costs and compress refinancing options (IMF, 2022). Where boards and owners anticipate rollover risk, e.g., by staggering maturities, deleveraging, or exiting low-return projects, zombification risks fall. The same inflationary stress renders passive or conflicted governance especially costly. Under high inflation, external users prize credible assurance. Elevated audit quality (partner capacity, independence, Big-N expertise) and more informative audit reports increase the probability of timely going-concern flags, accelerating either credible turnaround or orderly exit—both improving sector-level resilience (Sundgren, 2009; Muñoz-Izquierdo et al., 2024).

Stakeholder Theory

Stakeholder theory was formalised by R. Edward Freeman in his seminal 1984 book, Strategic Management: A Stakeholder Approach. Building on earlier management and organisational theories, Freeman proposed a paradigm shift from the traditional shareholder-centric view of the firm to a broader perspective that considers the interests of all stakeholders—individuals or groups who can affect or are affected by the firm's activities, such as employees, creditors, customers, communities, and governments (Freeman, 1984). The theory emerged as a response to the limitations of agency theory, which focuses primarily on shareholder-manager conflicts, by advocating for a more inclusive approach to corporate governance that balances diverse stakeholder interests (Freeman et al., 2021).

Stakeholder theory posits that firms exist to create value for all stakeholders, not just shareholders, and that effective governance requires managing these relationships to ensure long-term sustainability (Freeman, 1984). Its normative core argues that firms have ethical obligations to stakeholders, while its instrumental aspect links stakeholder management to improved firm performance, including financial resilience. The theory's relevance lies in its ability to address complex governance dynamics in contexts like Sub-Saharan Africa, where diverse stakeholders such as local communities, creditors, and regulators play critical roles in zombie firm dynamics amidst macroeconomic challenges like inflation.

Ownership structure influences stakeholder dynamics by determining who controls strategic decisions. Concentrated ownership, prevalent in Sub-Saharan Africa's family- or state-dominated firms, may prioritise certain stakeholders (e.g., family members or government interests) over others, potentially undermining resilience by delaying restructuring (La Porta et al., 1999). In contrast, dispersed ownership encourages broader stakeholder engagement through market discipline, improving metrics like the P/E ratio, but may lack decisiveness in crisis response (Freeman et al., 2010). Stakeholder theory suggests that inclusive ownership structures, engaging institutional investors or community stakeholders, enhance resilience by aligning decisions with long-term stakeholder value (Brahmana & Setiawan, 2025).

Stakeholder theory suggests that governance mechanisms that prioritise stakeholder inclusivity, such as transparent audits or diverse boards, enhance resilience by improving financial metrics and stakeholder trust (Donaldson & Davis, 1991). For instance, credible audit reports can reassure creditors, improving access to capital and supporting debt-to-equity ratio improvements (Munoz-Izquierdo et al., 2024). In Sub-Saharan Africa, stakeholder conflicts exacerbate zombie firm distress. Weak governance often prioritises dominant shareholders over creditors or communities, sustaining firms through forbearance rather than fostering recovery (Tomi et al., 2020). Stakeholder theory advocates for governance structures that engage all stakeholders, enhancing resilience by aligning decisions with broader interests, such as community welfare or creditor repayment, which can improve ROE and EPS (Ofori-Sasu et al., 2022). This approach is

critical for zombie firms, whose low resilience impacts economic growth and stakeholder livelihoods.

Inflation, as a macroeconomic variable, moderates the relationship between corporate governance and financial resilience by altering stakeholder dynamics. High inflation, common in Sub-Saharan Africa, increases operational costs and nominal debt, straining stakeholder relationships by reducing real returns and increasing financial distress (World Bank, 2023). Stakeholder theory posits that governance mechanisms should adapt to these pressures to maintain stakeholder value, but inflation complicates this by limiting resources available for stakeholder engagement (Freeman et al., 2010). For example, high inflation erodes EPS, reducing investor confidence, while increasing debt-to-equity ratios, straining creditor relationships (Cizkowicz et al., 2023).

In Zombie firms, inflation exacerbates stakeholder conflicts by amplifying distress. Boards may struggle to balance stakeholder demands under rising costs, as restructuring efforts are constrained, reducing resilience (Anyanwu et al., 2024). Concentrated ownership may prioritise shareholder interests, neglecting creditors or employees, further undermining resilience metrics (Brahmana & Setiawan, 2025). Audit quality, critical for stakeholder transparency, may falter under inflation, as volatile financials obscure reporting accuracy, reducing trust and resilience (Tomi et al., 2020). Stakeholder theory thus frames inflation as a moderator that challenges governance's ability to foster resilience by intensifying stakeholder conflicts in Sub-Saharan Africa's weak institutional context.

Inflation's moderating role is less studied but critical. Cizkowicz et al. (2023) found that high inflation in Europe weakens governance mechanisms, reducing resilience by increasing debt burdens. In Sub-Saharan Africa, Tomi et al. (2020) linked weak audit quality to zombie firm persistence in Nigeria, with inflation (e.g., 34.2% in 2024) amplifying distress by obscuring financial reporting (National Bureau of Statistics, 2024). Vercueil et al. (2023) noted similar dynamics in South Africa, where inflation undermines governance efforts to engage stakeholders, reducing resilience. These findings underscore stakeholder theory's utility in explaining how inflation moderates governance's impact on zombie firm resilience in Sub-Saharan Africa.

Financial distress theories

Financial distress theories, rooted in the broader fields of corporate finance and bankruptcy, gained significant academic traction with pioneering works that sought to predict and explain corporate failure. A foundational contribution was made by Edward I. Altman in his 1968 paper, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy." His work, which introduced the Z-Score model, marked a shift toward a quantitative approach to predicting financial distress and bankruptcy. Following this, seminal contributions by academics like Gordon Donaldson further developed the understanding of how firms manage financial distress, focusing on a more behavioural and managerial perspective. These theories are fundamentally relevant as they provide a framework for understanding why firms, especially those in a state of

chronic unprofitability like zombie firms, fall into distress and how they attempt to manage or survive in that state. They move beyond simple definitions of failure to explore the dynamic process of decline and the internal and external factors that influence a firm's trajectory.

Financial distress theories emerged from corporate finance literature to explain why firms face financial difficulties and how they respond to distress. A seminal contribution came from Edward I. Altman in 1968 with the development of the Z-score model, which quantifies the likelihood of bankruptcy based on financial ratios (Altman, 1968). Altman's work built on earlier studies by Beaver (1966), who analysed financial ratios to predict firm failure, laying the groundwork for distress prediction models. Subsequently, scholars like Wruck (1990) expanded the theory to include managerial and governance responses to distress, emphasising restructuring and recovery strategies. Financial distress theories encompass models that predict insolvency (e.g., Altman's Z-score) and frameworks that analyse the causes and consequences of distress, such as agency conflicts, capital structure inefficiencies, and external economic shocks (Altman & Hotchkiss, 2006).

These theories posit that financial distress arises from a combination of internal factors (e.g., poor management, high leverage) and external shocks (e.g., economic downturns, inflation), leading to an inability to meet financial obligations (Wruck, 1990). The relevance of financial distress theories lies in their ability to explain zombie firms' persistence, governance's role in mitigating distress, and the impact of macroeconomic factors like inflation, particularly in Sub-Saharan Africa, where weak governance and volatile economies sustain distressed firms (Ofori-Sasu et al., 2022).

Financial distress theories highlight governance as a critical factor in managing distress and enhancing resilience. Board structure, particularly independence and diversity, mitigates distress by providing effective oversight and strategic guidance. Independent boards can enforce restructuring to improve metrics like ROE and EPS, reducing the likelihood of prolonged zombification (Wruck, 1990; Ofori-Sasu et al., 2022). However, in Sub-Saharan Africa, boards often lack independence due to concentrated ownership, sustaining distress by delaying corrective actions, as seen in Nigerian zombie firms with high debt-to-equity ratios (Anyanwu et al., 2024).

Ownership structure influences distress dynamics by shaping control and decision-making. Concentrated ownership, common in Sub-Saharan Africa's family- or state-dominated firms, can reduce distress by enabling swift restructuring decisions, but it may also exacerbate distress if owners prioritise short-term survival over long-term viability, increasing debt-to-equity ratios (Altman & Hotchkiss, 2006; Brahmana & Setiawan, 2025). Dispersed ownership, while fostering market discipline, may lead to coordination failures, delaying responses to distress and weakening resilience (Shleifer & Vishny, 1997).

Inflation moderates the relationship between corporate governance and financial resilience by amplifying distress, as financial distress theories predict that external shocks exacerbate financial weaknesses (Altman & Hotchkiss, 2006). In Sub-Saharan Africa, high inflation (e.g., 10–20% annually) increases operational costs and nominal debt burdens, straining zombie firms' financial metrics and reducing resilience (World Bank, 2023). For

instance, inflation erodes real earnings, lowering EPS and P/E ratios, while increasing borrowing costs, elevating debt-to-equity ratios (Cizkowicz et al., 2023).

Empirical Review

Li et al. (2024) explored the impact of political connections on zombie firms in China, using regression analysis on data from non-financial firms (2003–2015). The findings suggest that politically connected firms are more likely to become zombies post-stimulus. The study concludes that political connections distort resource allocation, with data limitations post-2015. Fischer (2021) investigated zombie firms in the context of corporate restructuring and relationship banking in Germany, using regression analysis and peak order theory. The study found that information asymmetry and loan extensions contribute to zombification, mitigated by relationship banking. It concludes that stronger banking relationships could reduce zombie prevalence, but this effect is limited to the banking sector.

Berger and Liu (2025) investigated zombie firm restructuring in the U.S. using regression analysis on publicly listed firm data (1980–2019). The study found that operational restructuring significantly aids zombie survival. The conclusion emphasises restructuring as a recovery mechanism, noting limitations in excluding private firms and data post-2019. Naimo and Ogbeide (2022) explored zombie firm determinants and their economic implications in Nigeria using the generalised method of moments (GMM) and correlation analysis. The findings indicate that zombie firms lock resources in unproductive ventures, harming growth. The study concludes that regulatory gaps sustain zombification, with a gap in firm-level financial performance analysis.

Amundsen et al. (2023) exploit Canada's National Accounts Longitudinal Microdata File (2000–2019) to show that the overall zombie share (5–7%) is markedly lower than among publicly traded firms (18–36%), with diverging post–2011 trends uncovered via panel regressions. Cizkowicz et al. (2023) apply the CAMP model and correlation/regression analyses to firm-level data from 24 European countries (2000–2018), finding that ultra-low interest rates significantly boost asset-weighted zombie shares. Gabriel et al. (2023) draw on Mises-Hayek's Malinvestment theory to argue, through regression exercises, that distorted capital availability fosters zombie formation, albeit their highly hypothetical framework limits empirical grounding. Li et al. (2023) focus on Chinese A-share firms (2003–2017), using ex post facto Pecking Order regressions to identify "internal capital-market subsidies" as a crucial zombification channel. Finally, Shen et al. (2023) leverage Chinese Industrial Enterprise Data (1998–2013) to demonstrate that fierce bank competition and loose monetary policy amplify zombie incidence via standard regressions.

Wu et al. (2023) investigate how Chinese zombie enterprises (2003–2013) drive up carbon-emission intensity in small- and medium-sized cities via regression analyses, concluding that zombies are decisive climate-action hindrances in the energy sector. Nakamura's half-century overview (2023) reprises the manufacturing vs. non-manufacturing comparison, employing probit regressions on 1970–2019 firm data to reaffirm the stubborn

persistence of zombies across industrial domains, though again noting unclear industry coverage.

Chao & Philips (2023) extend zombie identification models under China's supply-side reform (2006–2018), finding via regression that post-2011 fiscal expansion significantly curbed manufacturing zombie shares. Hoshi et al. (2023) use Japanese credit-report data to show that low-credit-score firms pre-COVID were likelier to secure 2020 subsidies, though firm coverage remains unspecified. Bruhn et al. (2023) draw on follow-up enterprise surveys across emerging Europe and Central Asia to reveal, via OLS regressions, that stronger competition environments spurred reallocation toward higher-productivity firms post-COVID. Lin (2023) applies information-asymmetry theory to China's iron and steel listed firms (2003–2022), exposing, through ex-post factorial and regression methods, a mismatch between firm operations and market perceptions, yet limited to 28 enterprises.

Shome & Verma (2024) offer a systematic bibliometric review (Scopus/Web of Science; n = 132 articles) to map zombie-firm research trends and future agendas, albeit constrained by database scope. Ren et al. (2023) document a robust crowding-out effect in China (1998–2013), showing via regression that zombies suppress fixed-asset investment of healthy firms (CIED data). Vu et al. (2023) find in Vietnam (2006–2015) that credit access reduces zombie likelihood, though only up to certain thresholds and mainly for domestic private firms. Anyanwu & Ihejirika (2024) further show, via logistic regression in Nigeria, that poor cash-conversion cycles and extended receivables heighten zombification risk.

Moving to governance metrics, Brahmana & Setiawan (2025) document that higher corporate governance index scores among Indonesian firms (2014–2022) correlate with lower zombification probabilities, based on agency theory regressions. Veganzones & Severin (2024) use Tobit regressions on 2,794 French zombie firms to show governance dimensions critically shape exit timing, though generalisability is limited. Mashwani et al. (2024) employ Tobin's Q and resource-based theory in a global sample (49 countries, 2002–2019), finding zombies underperform on environmental and social fronts.

Laitinen (2024) developed a method to detect zombie firms among small Finnish companies using logistic regression analysis on data from 70,809 active and 134 bankrupt firms (2018–2024). The study found that financial statement data can effectively identify zombie firms, defined as active companies with high bankruptcy risk. It concludes that logistic regression models aid financiers in detecting zombies, noting limitations in the lack of international comparisons and focus on small firms. Tantri (2024) investigated the role of bank CEOs in zombie lending during crises in India, using regression analysis and agency, information asymmetry, and corporate governance theories on the Prowess database data (2007–2010). The study found that banks with CEO turnover are less likely to bail out insolvent firms. It concludes that leadership changes reduce zombie lending, limited to the banking sector.

Seo et al. (2024) examined AI models for predicting zombie firms in Korea post-COVID-19 using explainable AI (XAI) and regression analysis on data from 2019 to 2023. The study

found that the XGBoost model outperforms traditional logistic regression in predicting financial distress. It concludes that advanced AI enhances zombie detection, noting the scientific complexity of the methodology. Sarigul and Avci (2024) analysed the characteristics and economic impact of zombie firms in Turkey using numerical and regression analysis. The study found that zombie firms exhibit high debt, negative profits, and financial risks. It concludes that zombies threaten financial sustainability, with limitations in the hypothetical nature of the analysis.

Tan et al. (2024) studied the impact of short selling on de-zombification in China using regression analysis and principal-agent theory on listed firm data (2007–2020). The findings show that short-selling risk impedes de-zombification. The study concludes that market pressures affect zombie firm recovery, with data limitations post-2020 and unspecified firms. Minami and Yasuda (2024) investigated machine learning for classifying zombie firms in Japan using logistic regression on Astra Manager's financial data (1991–2021). The study found that machine learning predicts zombies effectively, with financial accounts varying by zombie indicator. It concludes that machine learning enhances detection, noting high model variance and data gaps post-2021.

Munoz-Izquierdo et al. (2024) examined expanded audit report disclosures' association with zombie firm determinants in Spain using regression analysis on 2017 data. The findings indicate that going concern uncertainties and key audit matters predict zombie status. The study concludes that audit reports aid zombie identification, limited to 2017 data. Witanto and Kuang (2024) explored the relationship between ESG practices and zombie firms during COVID-19 in Indonesia using stakeholder theory. The findings suggest that ESG practices prevent zombification. The study concludes that ESG enhances firm resilience, with data limited to 2018–2021.

Zhaxi and Yasuda (2024) studied corporate insolvency efficiency and cultural factors' impact on zombie firm prevalence using regression analysis on Orbis data from 43 countries (2015–2021). The findings show that efficient insolvency rules and individualistic cultures reduce zombie incidence. The study concludes that institutional and cultural factors matter, limited to one debt enforcement dimension. Anyanwu et al. (2024) investigated capital structure determinants of zombie firm status in Nigeria using logistic regression and agency theory on Nigerian Exchange Group data (2012–2021). The study found that a 1% increase in the long-term debt-to-asset ratio insignificantly increases interest coverage, reducing zombification. It concludes that capital structure influences zombie status, limited to non-financial firms and data post-2021.

Upadhyay and Baag (2024) conducted a systematic literature review on zombie firms using an empirical regression model on 99 ABDC-ranked articles (2000–2022). The study found that government grants and weak financial frameworks drive zombification. It concludes that policy interventions are needed, noting limitations in excluding non-journal publications and post-2022 data. Tuuli (2024) analysed bank versus non-bank financing of zombie firms in Finland using regression analysis on credit condition survey data since 1994. The study found that equity funding significantly extends zombie

lifetimes. It concludes that funding sources influence zombie survival, noting data recency issues.

Yin and Cao (2024) examined mixed-ownership reform's impact on zombie firms in Chinese state-owned enterprises (SOEs) using regression analysis on Shanghai and Shenzhen stock market data (2008–2019). The findings show that non-state director appointments reduce zombification. The study concludes that governance reforms aid de-zombification, limited to listed SOEs and pre-COVID-19 data. Blazkora et al. (2025) conducted a bibliographic review of zombie firm research using bibliometric and content analysis on 114 Web of Science articles. The study identified an exponential increase in zombie research post-2018 and four research streams. It concludes that the field is expanding, limited by excluding Google Scholar and Scopus articles.

Kitajima (2025) investigated corporate governance's influence on zombie firm dynamics in Japan using logistic regression on Tokyo Stock Exchange data (2014–2023). The findings show that foreign ownership prevents zombification and aids recovery. The study concludes that governance impacts zombie transitions, noting exclusions of certain sectors like banking. Brahmana (2025) used tree-based machine learning to identify zombification features in Indonesia, employing logistic regression on data from 109 private firms. The study found that debt and return on assets are key predictors. It concludes that machine learning enhances zombie detection, but is limited to private firms and excludes certain sectors.

Dzingirai (2025) investigated zombie firms on the Zimbabwe Stock Exchange using regression analysis and economic efficiency theory. The study identified negative effects like economic weakening and allocative inefficiency. It concludes that zombies harm economic growth, with unspecified firm counts and data periods as limitations. Kaplan and Aksoy (2025) examined zombie firms' effects on Turkey's economy using regression analysis and panel models on Enterprise Information System data (2006–2021). The study found rising zombie prevalence and negative impacts on healthy firms' investment and employment. It concludes that zombies hinder economic performance, noting data adjustments.

Gatopoulos et al. (2025) studied zombie firms' negative effects on Greece's economy using regression analysis on a panel dataset (2002–2021). The findings show adverse impacts on investment, employment, and productivity. The study concludes that resolving zombie issues benefits the economy, limited to the banking sector and data post-2021. Hamano et al. (2025) examined financial intermediation's role in zombie firm prevalence in Japan using quadratic regression models and capital injection theory on data from 31 industries (2000–2019). The study found that capital injections are effective in tight markets. It concludes that intermediation costs drive zombification, with unspecified industries as a limitation.

Ma and Dwyer (2025) examined the relationship between zombie firm status and innovation in research and development (R&D)-active SMEs in Korea, using a two-step system GMM and logit regression analysis on government-sponsored R&D firm data. The study found that zombie firms invest more in R&D than non-zombies, with zombie

congestion moderating this effect, leading to higher technological success. It concludes that zombie firms' R&D engagement can yield innovation, limited to R&D-focused SMEs. Nguyen et al. (2025) investigated the impact of zombie firms on the governance and financial performance of Vietnam's manufacturing industry during COVID-19, using logit regression on stock exchange data (2017–2021). The study found that zombie firms exhibit lower liquidity, capital efficiency, and profitability, negatively affecting industry performance. It concludes that zombies hinder financial outcomes, noting limitations in data post-2021 and a focus on manufacturing.

Sanches-Medina et al. (2025) developed a methodology for predicting zombie firms in Spain's tourism sector using logistic regression on data from 356 SMEs (2017–2019). The study established an information system for early zombie detection. It concludes that predictive algorithms enhance identification, limited by their focus on tourism SMEs and data post-2019. Ishiguro (2025) examined tax avoidance by non-zombie firms in Japan post-Lehman shock, using regression analysis on Tokyo Stock Exchange data (2008–2019). The study confirmed that non-zombie firms engage in tax avoidance. It concludes that financial health influences tax strategies, with data limitations post-2019.

Tay et al. (2025) investigated zombie firm prevalence in Malaysia's industrial products and services sector, using logistic regression on Bursa Malaysia data (2011–2022). The study found that 22% of firms with adequate disclosures are zombies. It concludes that zombie prevalence is significant, limited to specific industries. Ascani and Nair (2025) studied whether zombie firms hinder innovation by non-zombies in Italy, using regression analysis. The findings show that zombies negatively affect healthy firms reliant on external finance or operating in competitive markets. The study concludes that zombies impede innovation, with unspecified sectors and time periods as limitations.

Rai et al. (2025) examined zombie firms' congestion effects on industrial upgrading in India, using the Hausman test and Breusch-Pagan Lagrange Multiplier for regression analysis on manufacturing firm data. The study found that zombies hinder productivity, trade, and innovation. It concludes that zombies impair industrial efficiency, limited to manufacturing firms. Garcia-Merino et al. (2025) analysed institutional contexts and the social impact of zombie firms worldwide, using multivariate regression on Orbis data from 87,573 companies across 115 countries (2019–2021). The study found that institutional factors influence zombification, which can reduce income inequality. It concludes that zombies have complex social impacts, with data limitations post-2021.

Mazario et al. (2024) studied the informativeness of expanded audit reports in identifying zombie firms in Spain, using a logistic regression model on data from 228 public interest entities in 2017. The study found that key audit matters (KAMs) accurately predict zombie status. It concludes that audit reports enhance detection, but the findings are limited to 2017 data. Chari et al. (2019) examined regulatory forbearance's role in zombie lending in India, using regression analysis on data from listed and unlisted firms (1989–2016). The study found a strong correlation between bank distress and credit to low-liquidity firms. It concludes that regulatory arbitrage sustains zombies, with data gaps post-2016, excluding India's demonetization policy.

Fang et al. (2020) studied the impact of top executive gender on zombie firm likelihood in China, using qualitative analysis and agency theory on listed firm data. The findings show that higher female executive percentages reduce zombification. The study concludes that gender diversity enhances resilience, limited to a gender focus. Nurmi et al. (2020) explored government subsidies' impact on zombie firm survival in Finland, using a competing risk model and regression analysis. The study found that subsidies prevent liquidation and increase recovery chances. It concludes that subsidies sustain zombies, limited to government support and excluding the private sector.

Vercueil et al. (2023) analysed zombie firms in South Africa, using regression analysis on data from OECD, IMF, and BIS. The study found that South Africa's fragile economy became more vulnerable to zombies post-COVID-19. It concludes that insolvency laws influence zombification, with a focus on legal frameworks limiting generalisation. Garcia-Merino et al. (2025) explored institutional contexts and zombie firms' impact on income inequality in 115 countries, using regression analysis on data from 87,573 firms (2019–2021). The study found that economic and political factors do not increase inequality via zombification. It concludes that institutional factors have nuanced effects, limited by a focus on institutional indicators and data post-2021.

Gabriel (2024) investigated zombie firms' impact on resource misallocation in Europe, using descriptive and regression analysis with Malinvestment and Market Distortion theories. The study found that misallocated credit and subsidies sustain zombies, hindering market dynamics. It concludes that policy reforms are needed, noting a lack of UK-specific analysis. Michie (2023) critiqued zombie firm classifications using a qualitative, critical literature review and Marxist production theory. The study found that many labelled zombies are not economically inefficient. It concludes that productivity-based classifications are needed, limited by the lack of empirical analysis and a revised measurement framework.

METHODOLOGY

The study adopts an ex post facto research design, which is appropriate for examining relationships between variables using historical data without manipulating independent variables (Kerlinger & Lee, 2000). The population of the study comprises all listed non-financial firms in Nigeria. This country was chosen for its economic significance, representation of the region's diversity, and availability of data on zombie firms (Anyanwu et al., 2024; Vercueil et al., 2023; Dzingirai, 2025). The sample size for this study is 20 firms from the Nigerian manufacturing sector. This sample size is determined using purposive sampling criteria focused on zombie firms, identified as those with negative interest coverage ratios for at least three consecutive years within the 2015–2024 period (Caballero et al., 2008). Secondary data will be collected from reliable sources like stock exchange databases and the World Bank, ensuring completeness and minimising missing values through imputation techniques if necessary (Baltagi, 2021). This study employs purposive sampling, a non-probability technique that selects units based on specific criteria to ensure relevance to the research objectives (Etikan et al., 2016). Data analysis

in this study employs quantitative techniques to test the hypotheses on the moderating effect of inflation, utilising panel data regression models suitable for the ex post facto design (Baltagi, 2021). Descriptive statistics, including means, standard deviations, and correlations, will first summarise the variables, identifying patterns in governance and resilience metrics across the sample (Saunders et al., 2019). The inferential analysis used was panel regression.

Measurement of Variables

The variables in this study are operationalised based on established literature to ensure validity and reliability. Measurements are summarised in the table below, adapted from studies like Ofori-Sasu et al. (2022) and Anyanwu et al. (2024).

Table 1: Operationalisation of Variables

Variable (label)	Measurement / Construction	Expected sign (on resilience)	Sources
Financial resilience (Dependent variable)			
Price-to-Earnings (P_E_it)	Market price per share ÷ EPS (annual). If negative EPS, treat as missing	+ (higher = greater market confidence)	(Ghoul et al., 2021). (Anyanwu et al., 2024).
Ownership structure (Independent variables)			
Managerial ownership (MOWN_it)	% of shares held by executives and management	Ambiguous (can be + or – depending on entrenchment vs alignment)	(Jensen & Meckling, 1976). (La Porta et al., 1999).
Concentrated ownership (CONC_it)	% shares held by largest shareholder (or top-3 sum)	ambiguous (monitoring or entrenchment)	Jensen & Meckling, 1976). (La Porta et al., 1999).
Moderating variable			
Inflation rate (INFL_ct)	Annual CPI inflation rate (%) for country c in year *t* (source: IMF/NSO/WDI)	Moderator	(Cizkowicz et al., 2023).
Control variables			
Firm size (FSIZE_it)	ln(Total assets) or ln(Market capitalization)	+ (larger firms more resilient)	(Ofori-Sasu et al., 2022).
Firm age (FAGE_it)	Years since incorporation or listing	+ (older firms may be more resilient)	(Brahmana & Setiawan, 2025).

Source: Researcher compilation, 2025

Notes on variable construction & data issues

Zombie flag (for sub-analyses): interest coverage < 1 for at least 3 consecutive years (EBIT / Interest expense). This is not a main dependent variable but is used for subgroup tests. (Caballero et al., 2008; IMF WP 2023.) 12 out of 20 were zombie firms

Model Specification

The model specification is based on panel regression to test the moderating effect of inflation on the relationship between ownership structure and financial resilience. This specification follows moderated regression models from governance studies (Baltagi, 2021; Anyanwu et al., 2024; Ofori-Sasu et al., 2022).

Hence, to achieve the main objective of this study, of showing the effect of Ownership structures and financial resilience, the model of Ofori-Sasu et al. (2022) was adapted as follows:

FS = *f* (OS) ……3.1

P/Eit = β0 + β1CONCt+β2MOWNit +β3FSIZEit+β4FAGEit+εit……3.2

P/Eit = β0 + β1MOWNit+β2CONCit+β3MOWN*INFit+β4CO VDCVNCI*INFit + β5INFit+ +β6FSIZEit +β7FAGEit+εit…… .3.3

Where: FR = Financial Resilience; Price-to-Earnings = PE; Managerial ownership = MOWN; Concentrated ownership = CONC; Inflation rate = INF; Firm size = FSIZE; Firm age = FAGE; OS*INF, Interaction term capturing moderation; β0 = Constant; β1-β5= co-efficient; i =ith firm; t = period; ε= Error term.

Descriptive Statistics

The descriptive statistics provide an overview of the distributional properties of the variables under study, offering insights into their central tendencies, dispersion, and normality. Each variable is examined individually to highlight its implications for the financial resilience of zombie firms in Nigeria.

Table 2: Descriptive Statistics

	Inflation (%)	FIRM SIZE	FIRM AGE	P_E_RATIO	CONC (%)	MOWN (%)	CONC (%)*INFL	MOWN (%)*INFL
Mean	15.96000	26.18842	36.33333	9.699917	58.93675	20.37200	940.8269	325.3217
Median	16.10000	26.43000	36.50000	3.240000	60.78000	18.91000	902.8795	299.5855
Maximum	24.50000	27.06000	62.00000	536.2800	82.03000	37.83000	1955.100	802.6200
Minimum	9.000000	24.61000	13.00000	0.000000	27.18000	5.070000	270.5400	47.25000
Std. Dev.	4.533172	0.755393	14.68054	49.35848	12.71456	8.515179	343.6079	170.4439
Skewness	0.323379	-1.036637	0.152050	10.26760	-0.817031	0.220113	0.516072	0.822209

	Inflation (%)	FIRM SIZE	FIRM AGE	P_E_RATIO	CONC (%)	MOWN (%)	CONC (%)*INFL	MOWN (%)*INFL
Kurtosis	2.244298	2.801408	1.860419	109.8005	3.620596	2.280021	2.971740	3.196491
Jarque-Bera	4.946916	21.68950	6.955610	59140.22	15.27648	3.560848	5.330603	13.71360
Probability	0.084293	0.000020	0.030875	0.000000	0.000482	0.168567	0.069578	0.001052
Sum	1915.200	3142.610	4360.000	1163.990	7072.410	2444.640	112899.2	39038.60
Sum Sq. Dev.	2445.408	67.90360	25646.67	289914.9	19237.55	8628.485	140499 02	345708 4.
Observations	120	120	120	120	120	120	120	120

Source: ***Researcher's Computation (2025)***

The descriptive statistics reveal that while inflation and ownership structures exhibit moderate variability, the P/E ratio is highly skewed, reflecting the distressed nature of zombie firms. Firm size is relatively homogeneous, while firm age shows wide variation. Ownership concentration is generally high, and managerial ownership is moderate, both with implications for governance and resilience. The interaction terms highlight the importance of inflation as a moderator, influencing how ownership structures affect financial resilience. These findings set the stage for regression analysis, where the hypothesised relationships can be empirically tested.

Correlation Matrix

Table 3: Correlation Statistics

	P/E Ratio	MOWN (%)	CONC (%)	Inflation (%)	Firm Size	Firm Age	MOWN (%)*INFL	CONC (%)*INFL
P/E Ratio	1							
	120							
MOWN (%)	-.036	1						
	.697							
	120	120						
CONC (%)	-.098	-.126	1					
	.289	.169						
	120	120	120					
Inflation (%)	.163	.005	.003	1				
	.075	.958	.970					
	120	120	120	120				

	P/E Ratio	MOWN (%)	CONC (%)	Inflation (%)	Firm Size	Firm Age	MOWN (%)*INFL	CONC (%)*INFL
Firm Size	.039	.075	-.109	.041	1			
	.675	.418	.236	.654				
	120	120	120	120	120			
Firm Age	-.121	.267**	.161	.152	-.124	1		
	.186	.003	.079	.096	.177			
	120	120	120	120	120	120		
MOWN (%)*INFL	.038	.813**	-.099	.543**	.080	.287**	1	
	.679	.000	.282	.000	.383	.001		
	120	120	120	120	120	120	120	
CONC (%)*INFL	.047	-.071	.601**	.784**	-.031	.221*	.362**	1
	.608	.441	.000	.000	.733	.015	.000	
	120	120	120	120	120	120	120	120

Source: ***Researcher's Computation (2025)***

The price-to-earnings (P/E) ratio, the dependent variable representing financial resilience, shows weak correlations with all explanatory variables. Managerial ownership (r = -0.036, p = 0.697) and concentrated ownership (r = -0.098, p = 0.289) both exhibit negative but insignificant relationships, suggesting that ownership structures alone do not strongly influence market confidence in zombie firms. Inflation (r = 0.163, p = 0.075) shows a weak positive correlation, approaching significance, implying that higher inflation may slightly increase P/E ratios, though the effect is not robust. Firm size (r = 0.039, p = 0.675) and firm age (r = -0.121, p = 0.186) also display weak and insignificant associations. Similarly, the interaction terms (managerial ownership × inflation and concentrated ownership × inflation) show negligible correlations with the P/E ratio. Overall, these results suggest that direct bivariate relationships between governance variables and resilience are weak, reinforcing the need for multivariate regression analysis to uncover conditional and moderated effects.

Managerial ownership correlates positively with firm age (r = 0.267, p = 0.003), indicating that older firms tend to have higher managerial stakes, possibly due to long-term entrenchment or accumulated insider holdings. The strongest relationship is between managerial ownership and its interaction with inflation (r = 0.813, p = 0.000), which is expected since the interaction term is mathematically derived from managerial ownership and inflation. This confirms the robustness of the moderation variable. Managerial ownership also shows a significant positive correlation with firm age × inflation (r = 0.287, p = 0.001), suggesting that inflation amplifies the governance effect in older firms. Concentrated ownership correlates strongly and positively with its interaction with inflation (r = 0.601, p = 0.000), again reflecting the mathematical construction of the interaction term. It also shows a weak positive correlation with firm age (r = 0.161, p = 0.079), though not statistically significant, suggesting that older firms may have slightly more concentrated ownership. The negative but insignificant correlation with firm size (r = -0.109, p = 0.236) implies that larger firms may have more dispersed ownership structures.

Inflation correlates significantly with both interaction terms: managerial ownership × inflation (r = 0.543, p = 0.000) and concentrated ownership × inflation (r = 0.784, p = 0.000). These strong positive correlations confirm that inflation plays a critical moderating role in shaping the governance–resilience nexus. Inflation also shows weak positive correlations with firm age (r = 0.152, p = 0.096) and firm size (r = 0.041, p = 0.654), though neither is statistically significant. Firm size shows no significant correlations with other variables, suggesting that size does not strongly interact with ownership or inflation in this dataset. Firm age, however, demonstrates several significant relationships: it correlates positively with managerial ownership (r = 0.267, p = 0.003), managerial ownership × inflation (r = 0.287, p = 0.001), and concentrated ownership × inflation (r = 0.221, p = 0.015). These findings imply that older firms are more likely to exhibit governance structures that interact meaningfully with inflationary pressures, potentially influencing resilience outcomes.

Regression Analysis: Regression analysis was conducted to examine the moderating effect of inflation on the relationship between ownership structure and the financial resilience of zombie firms in Nigeria, measured by the price-to-earnings (P/E) ratio.

Table 4

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.291[a]	.085	.028	48.669	2.119

a. Predictors: (Constant), CONC (%)*INFL, Firm Size, MOWN (%), Firm Age, CONC (%), MOWN (%)*INFL, Inflation (%)

b. Dependent Variable: P/E Ratio

Table 5

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	24623.372	7	3517.625	1.485	.180[a]
	Residual	265291.552	112	2368.675		
	Total	289914.924	119			

a. Predictors: (Constant), CONC (%)*INFL, Firm Size, MOWN (%), Firm Age, CONC (%), MOWN (%)*INFL, Inflation (%)

b. Dependent Variable: P/E Ratio

Table 6

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-170.173	185.001		-.920	.360
	Inflation (%)	12.589	5.643	1.156	2.231	.028

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Firm Size	.445	6.020	.007	.074	.941
	Firm Age	-.455	.330	-.135	-1.376	.172
	MOWN (%)	2.502	2.047	.432	1.222	.224
	CONC (%)	1.721	1.333	.443	1.292	.199
	MOWN (%)*INFL	-.158	.121	-.545	-1.307	.194
	CONC (%)*INFL	-.125	.079	-.868	-1.571	.119

a. Dependent Variable: P/E Ratio

The regression results provide a clear, if modest, picture of how the set of predictors explains variation in the P/E ratio for the sampled firms. The model's multiple correlation coefficient (R = 0.291) indicates a weak overall linear association between the predictors and the dependent variable. The R-squared value of 0.085 shows that only about 8.5% of the variation in P/E ratios is explained by the included variables, and the adjusted R-squared falls further to 0.028 after accounting for the number of predictors and sample size. In practical terms, the model captures only a small fraction of the drivers of market valuation in this sample, leaving the majority of variation unexplained.

The ANOVA table confirms that the model as a whole is not statistically significant at conventional levels. The F statistic (F = 1.485) with an associated p-value of 0.180 indicates that the joint explanatory power of the seven predictors does not differ significantly from a model with no predictors. This reinforces the R-squared interpretation and suggests caution in drawing strong inferences from the full set of coefficients taken together.

Turning to individual coefficients, inflation is the only predictor that is statistically significant at the 5% level. The unstandardized coefficient for inflation is 12.589 (t = 2.231, p = 0.028), implying that, holding other variables constant, a one percentage-point increase in the inflation rate is associated with an increase of about 12.59 units in the P/E ratio. This positive and significant relationship suggests that inflationary conditions in the sample period are associated with higher market valuations per unit of earnings for these firms, a result that may reflect investor behaviour under inflation (for example, revaluation of nominal earnings, risk premia adjustments, or sectorial pricing dynamics).

All other predictors show statistically insignificant effects in this specification. Firm size has a near-zero coefficient (B = 0.445, p = 0.941), indicating no detectable relationship with P/E in this sample once other factors are controlled. Firm age carries a negative but non-significant coefficient (B = -0.455, p = 0.172), suggesting a weak tendency for older firms to have lower P/E ratios, though this effect is not robust. Managerial ownership (MOWN) and concentrated ownership (CONC) both have positive point estimates (B = 2.502 and B = 1.721, respectively) but neither reaches statistical significance (p = 0.224 and p = 0.199). These estimates imply that, conditional on the other covariates, higher insider or concentrated shareholdings are associated with higher P/E ratios in the sample, but the evidence is too weak to reject the null of no effect.

The interaction terms intended to capture moderation by inflation—MOWN × INFL and CONC × INFL—have negative coefficients (B = -0.158 and B = -0.125) but are not

statistically significant (p = 0.194 and p = 0.119). The negative signs would, if significant, indicate that higher inflation weakens the positive association between ownership concentration or managerial ownership and P/E ratio. Given the lack of significance, however, the data do not provide reliable support for the hypothesised moderating effect of inflation in this linear specification.

Discussion of Findings

The positive and significant effect of inflation on P/E ratios suggests that macroeconomic conditions play a decisive role in shaping market valuations of distressed firms. This finding resonates with Cizkowicz et al. (2023), who demonstrated that ultra-low interest rates and monetary conditions significantly influence zombie prevalence in Europe. Similarly, Shen et al. (2023) found that loose monetary policy amplifies zombie incidence in China. In the Nigerian context, inflation appears to act as a macroeconomic shock that alters investor perceptions, potentially inflating valuations despite weak fundamentals. This aligns with Vercueil et al. (2023), who noted that fragile macroeconomic environments in South Africa heightened vulnerability to zombification post-COVID-19.

The regression results showed that managerial and concentrated ownership had positive but statistically insignificant effects on P/E ratios. This contrasts with studies such as Brahmana & Setiawan (2025), who found that stronger governance metrics reduce zombification in Indonesia, and Kitajima (2025), who reported that foreign ownership prevents zombification in Japan. The lack of significance in Nigeria may reflect institutional weaknesses, regulatory gaps, or limited enforcement of governance standards, as highlighted by Naimo & Ogbeide (2022) in their Nigerian study. Moreover, the insignificant moderation effects of inflation on ownership structure suggest that governance mechanisms in Nigeria may not be strong enough to counteract macroeconomic shocks. This differs from findings in Yin & Cao (2024), who showed that governance reforms in Chinese SOEs reduced zombification, and Veganzones & Severin (2024), who found governance dimensions critical in shaping exit timing among French zombie firms. The Nigerian evidence points to a weaker role of ownership in resilience, consistent with Anyanwu & Ihejirika (2024), who emphasised poor cash-conversion cycles and receivables management as stronger drivers of zombification than ownership concentration.

Firm size and firm age were also insignificant predictors of P/E ratios in the regression. This contrasts with Amundsen et al. (2023), who found differences in zombie prevalence between publicly traded and smaller firms in Canada, and Nakamura (2023), who highlighted persistent differences across manufacturing and non-manufacturing sectors in Japan. The Nigerian results suggest that firm-level characteristics may be less influential than macroeconomic conditions, reinforcing the idea that inflationary pressures dominate resilience outcomes in volatile economies. The findings underscore the importance of macroeconomic stability in mitigating zombification risks. While governance and ownership structures are widely recognised in the literature as important determinants of resilience (e.g., Berger & Liu, 2025; Brahmana & Setiawan,

2025; Kitajima, 2025), their effects appear muted in Nigeria's context. Instead, inflation emerges as the critical driver, consistent with studies emphasising the role of distorted capital availability and macroeconomic shocks (e.g., Gabriel et al., 2023; Shen et al., 2023; Vercueil et al., 2023).

Conclusion and Recommendations

This study set out to investigate how inflation moderates the impact of ownership structure on the financial resilience of zombie firms in Nigeria. Drawing from agency theory and macroeconomic theory, it hypothesised that ownership concentration would enhance resilience through improved monitoring, but that this relationship would be negatively moderated by high inflation through increased information asymmetry and economic distortion. The empirical evidence leads to several definitive conclusions. First, ownership structure, whether managerial or concentrated, does not exhibit a statistically significant direct impact on the market-based financial resilience of Nigerian zombie firms. While coefficients were positive, suggesting potential alignment effects, the relationships lack statistical robustness. This finding partially aligns with the theoretical ambiguity in the literature but contrasts with more definitive results from other regions, suggesting that standard governance mechanisms may operate differently in Nigeria's institutional context, characterised by weak enforcement and regulatory gaps.

Second, inflation operates as a powerful contextual factor with complex, paradoxical effects. Its significant positive direct relationship with P/E ratios suggests that, contrary to conventional wisdom, inflationary periods may be associated with higher market valuations for zombie firms. This could reflect investor expectations of nominal revenue growth, asset revaluation benefits, or anticipated government intervention for distressed firms during economic stress. This finding resonates with emerging market studies that note valuation anomalies during macroeconomic instability. Third, regarding the core research question, the evidence provides limited but directionally consistent support for inflation's moderating role. The negative interaction coefficients, though statistically marginal, suggest that high inflation environments may undermine the potential governance benefits of ownership concentration. This implies that the effectiveness of internal monitoring mechanisms is contingent on macroeconomic stability, a finding with important theoretical implications for adapting agency theory to high-inflation emerging economies.

The study ultimately concludes that the financial resilience of Nigerian zombie firms, as perceived by the market, is more strongly influenced by macroeconomic conditions than by internal governance structures. Based on the findings and conclusions of this study, the following recommendations are offered to relevant stakeholders:

Given that ownership concentration shows attenuated effects during high inflation, firms should complement traditional ownership-based monitoring with additional governance safeguards. This could include establishing dedicated risk committees focused on macroeconomic volatility and implementing dynamic, inflation-adjusted performance metrics for management.

To counteract the information asymmetry exacerbated by high inflation, management should increase the frequency and detail of financial disclosures, particularly regarding how inflation affects input costs, pricing power, and debt servicing capacity. Rather than relying solely on concentrated ownership for governance, firms should consider hybrid models that combine strategic blockholders with strong independent board oversight and performance-linked compensation aligned with real (inflation-adjusted) returns.

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