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SCHOOL OF POSTGRADUATE STUDIES

**COPPER VALUE ADDITION, STAKEHOLDER ENGAGEMENT AND INSTITUTIONAL
FRAMEWORK OF ZAMBIA'S MINING SECTOR**

BY

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**A Thesis submitted to the School of Post graduate studies for the Degree of the
Doctor of Philosophy in Economics**

2026

DECLARATION

I, Bondo Chisanga do hereby declare that the work in this Thesis is mine, and has not been submitted for a Doctor of Philosophy (Ph.D.) degree to the University of Lusaka or any other University. All that knowledge acquired from other scholars has been acknowledged and cited in the places where they appear.

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UNIVERSITY APPROVAL

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Signature.....

Date.....

DEDICATION

This thesis is dedicated with love and gratitude to my husband Dr. Kabuyana Sianga, whose steadfast support and encouragement have sustained me through every stage of this journey. This thesis is also dedicated to my grandfather, Mr. Clement Siame, whose unshakable faith in God has been a covering over our family across generations. His unwavering support in every season of my life, coupled with his steadfast belief in me, has been a constant source of strength and direction.

I also dedicate this work to my grandmother, Mrs. Anna Siame, for her enduring love, encouragement, and unbreakable support, which have sustained me through moments of doubt and perseverance alike.

Finally, this thesis is dedicated to my son, Aayan Luthando Mbambo Sianga. May this achievement serve only as a milestone that you will one day look back on with pride, knowing that you too can dream boldly, persevere faithfully, and attain even greater heights.

To my close family, who have stood by me with unwavering belief in my ability to persevere, and to my friends, who offered constant encouragement and reminded me of the bigger picture; this achievement belongs to you as much as it does to me.

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I also acknowledge the guidance of the Holy Spirit in all my aspirations and endeavours. The contributions of my colleagues, research peers, and the wider academic community, whose discussions and feedback enriched this work. Finally, I am grateful to the institutions and individuals who participated in and facilitated this research, providing insights that form the backbone of this thesis.

MOTIVATION

The motivation for undertaking this thesis arises from both academic curiosity and national urgency. Zambia's economic fortunes have long been tied to copper, yet the value chain remains marked by structural weaknesses, volatility in global prices, and governance challenges. Against this backdrop, stakeholder engagement has emerged as an essential yet contested mechanism for aligning economic benefits with local development and sustainable governance. By exploring the intersection of economic factors, the copper value chain, and stakeholder engagement, this thesis seeks to contribute knowledge that is not only relevant to scholarly debates in development and institutional economics but also to policy reforms in resource-dependent economies.

On a personal level, this work reflects the pursuit of intellectual growth and the dream of achieving the highest attainable qualification in my discipline. The PhD journey is more than an academic milestone; it represents resilience, dedication, and the conviction that rigorous research can influence both policy and practice. My aspiration is that the findings of this thesis will add value to Zambia's discourse on resource governance, while also serving as a foundation for continued scholarly contribution in global debates on extractives, development, and institutions.

This achievement is also profoundly personal. For much of my life, the idea of earning a doctorate felt distant, something reserved for others, not for a Bemba girl from Chinsali who dared to imagine a different path. Yet this journey has reaffirmed that social norms, inherited limitations, and historical barriers can be challenged when determination meets opportunity. In many ways, this thesis stands as a quiet defiance of the expectations traditionally placed on young women from rural Zambia. It represents the belief that intellect is not defined by geography, that ambition is not constrained by background, and that the courage to dream can open doors beyond what one once thought possible.

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LIST OF ACRONYMS

ARDL	Autoregressive Distributed Lag
AUC	Area under the curve
CSO	Central Statistical office
EITI	Extractive Industries Transparency Initiative
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GRZ	Government of the Republic of Zambia
ICMM	International Council on Mining and Metals
IMF	International Monetary Fund
MCM	Mopani Copper Mine
MOFNP	Ministry of Finance and National Planning
NDP	National Development Plan
7NDP	Seventh National Development Plan
8NDP	Eight National Development Plan
NGO	Non-governmental organisation
OECD	Organisation for Economic Cooperation & Development
RDT	Resource Dependence Theory
SLO	Social License to Operate
UNDP	United Nations Development Programme
WB	World Bank
ZAMEFA	Metal fabricators of Zambia PLC
ZCCM	Zambia Consolidated Copper Mines
ZCCM-IH	Zambia Consolidated Copper Mines Investment Holdings
ZRA	Zambia Revenue Authority

ABSTRACT

This study investigates the interrelationship between economic factors, copper value-chain performance, and stakeholder engagement in Zambia's mining sector. Despite decades of copper-led growth, Zambia continues to experience low levels of industrial value addition and persistent governance challenges associated with resource dependence. Grounded in a pragmatic mixed-methods paradigm, this study systematically pursues three specific research objectives: (1) to evaluate the macroeconomic determinants of copper value addition in Zambia using an Autoregressive Distributed Lag (ARDL) bounds testing framework, (2) to examine the micro-level institutional factors influencing stakeholder satisfaction with resource governance frameworks using a binary logistic regression model, and (3) to formulate an integrated policy framework that aligns economic strategies with stakeholder legitimacy.

The research integrates three complementary analytical phases. The first phase applies an Autoregressive Distributed Lag (ARDL) bounds-testing framework to national time-series data spanning 1980–2021 to evaluate long-run cointegrating relationships and short-run error-correction dynamics underlying copper value addition in Zambia. The second phase employs binary logistic regression on stakeholder survey data to assess how engagement frequency, engagement effectiveness and perceived influence relate to governance satisfaction. The third phase uses qualitative thematic analysis to capture stakeholder experiences and contextual mechanisms that may not be observable through numerical models.

The empirical estimates reveal that macroeconomic variables exert significant long-run influence on copper value addition. National economic growth has a positive long-run coefficient ($\beta = 0.4312$, $t = 2.302$, $p = 0.0290$), while mineral rents and trade value margins are also positively associated with value addition. Inflation has a negative long-run effect ($\beta = -0.2784$, $t = -2.856$, $p = 0.0073$), while higher global copper prices are negatively associated with local value addition ($\beta = -0.3465$, $t = -3.042$, $p = 0.0095$), consistent with the Resource-Price Paradox. The dynamic model exhibits structural stability and a significant error-correction term ($\text{CointEq}(-1) = -0.6318$, $t = -6.606$, $p < 0.001$), indicating adjustment towards long-run equilibrium following short-run shocks. Phase Two analyses 250 stakeholder responses. The binary logistic regression indicates

that Engagement Frequency ($\beta = -0.081$, $p = 0.392$), Engagement Effectiveness ($\beta = -0.001$, $p = 0.995$) and Influence on Governance ($\beta = 0.042$, $p = 0.648$) are individually statistically insignificant in the estimated model. The marginal effects similarly indicate small changes in predicted satisfaction probability (-0.020 , 0.000 and 0.010 respectively). The model records an AUC of 0.64 and a Hosmer–Lemeshow p -value of 0.562 , indicating modest discrimination and no evidence of poor fit. The qualitative findings nevertheless identify concerns about superficial participation, information asymmetry, weak follow-up and limited substantive influence. Taken together, the findings indicate that sustainable copper-based development requires coordinated macroeconomic management, industrial diversification and participatory governance reforms.

Based on these findings, the study recommends a coordinated policy package. First, the Ministry of Finance and National Planning should establish a formal mineral-rent reinvestment policy that ring-fences a defined share of mining revenues for targeted tax rebates and concessional domestic credit lines for downstream copper fabricators. Second, monetary and fiscal authorities should strengthen macroeconomic coordination to reduce exchange-rate and inflation volatility and improve the predictability of long-term industrial investment. Third, Zambia should establish a National Copper Value Chain Council to coordinate government, mining companies, domestic manufacturers, labour, communities and other stakeholders, reduce institutional fragmentation and strengthen meaningful participation across the copper value chain. These measures would help align mineral revenues, industrial incentives and stakeholder legitimacy with the objective of deeper domestic value addition.

Keywords: ARDL Bounds Test, Copper Value Chain, Economic Factors, Governance, Resource Dependence, Stakeholder Engagement, Value Addition, Zambia

CHAPTER ONE:

BACKGROUND TO THE STUDY

1.0 Introduction

The Resource-Price Paradox provides the central economic puzzle underlying Zambia's copper trajectory: periods of strong international copper demand and rising commodity prices do not necessarily translate into proportionate expansion of domestic value addition. Copper is strategically important to industrialisation, urban development, digitalisation and the global transition towards low-carbon technologies (International Copper Study Group, 2023; World Bank, 2020). Yet for mineral-dependent economies, resource booms can coexist with structural dependence, external vulnerability and weak domestic industrial linkages (Auty, 1993; Sachs & Warner, 2001). Zambia provides an important setting in which to examine this tension because copper remains central to export earnings, fiscal resources and the country's structural transformation agenda.

The paradox becomes particularly important when the global demand for copper rises. Higher prices can increase incentives to expand extraction and exports rapidly, while domestic downstream processing requires long-term investment, reliable infrastructure, macroeconomic stability and institutional coordination. Zambia has therefore faced a persistent tension between maximising short-run mineral revenues and building the domestic capabilities required for higher-value processing, fabrication and manufacturing. This study investigates that tension alongside the institutional question of whether stakeholder engagement and governance legitimacy can support the conditions necessary for sustainable value-chain upgrading.

On the global stage, the accelerating momentum toward a green transition underpinned by the mass adoption of electric vehicles, renewable energy infrastructure, and clean technology grids has exponentially amplified the strategic value of copper as a critical underlying commodity. However, for mineral-dependent exporters like Zambia, this surging global demand does not automatically translate into domestic wealth, instead intensifying a deep-seated economic-institutional tension. Macroeconomically, the state faces intense structural pressure to rapidly maximise raw ore extraction and export volumes to capture foreign exchange and debt-servicing revenues. Conversely, at the micro-institutional level, achieving long-term structural

transformation requires deliberate regulatory constraints, localised value-chain integration, and inclusive stakeholder engagement models to counter historical patterns of profit repatriation. This friction between external macroeconomic extraction pressures and the domestic institutional quality needed to enforce localised value addition forms the foundational problem space of this study.

At the macroeconomic level, Zambia's experience illustrates how fluctuations in GDP growth, exchange rates, inflationary pressures and global commodity prices shape capital allocation, production efficiency and value chain engagement. Empirical studies in resource economics have argued that volatile macroeconomic environments discourage long-term investment in processing infrastructure and incentivise extractive enclaves over fully integrated mineral value chains (Gelb, 2010; McKinsey Global Institute, 2013). In periods of high copper prices, economies such as Zambia often prioritise raw export expansion rather than downstream industrial development, consistent with the pro-cyclical behaviour identified in resource-dependent policy cycles (Sachs & Warner, 2001; Auty & Warhurst, 1993). Conversely, macroeconomic shocks such as currency depreciation and inflationary surges raise production costs, deter industrial upgrading and exacerbate the financial risks associated with beneficiation (Giurco & Northey, 2014). Understanding the extent to which macroeconomic variables influence copper value addition remains a critical yet underexplored question, especially through robust econometric approaches that integrate long-term and short-term effects.

Underlying Zambia's modern mineral trajectory is a profound structural contradiction that defies orthodox economic theory: the Resource-Price Paradox. Rooted fundamentally in the broader Resource Curse Thesis formulated by Auty (2001) and the institutional dependency models of Mehlum, Moene, and Torvik (2006), this paradox manifests as a systemic distortion where escalating global commodity price booms which conventionally ought to generate surplus capital for domestic industrialisation instead trigger a structural contraction in localised value addition. As recently conceptualised by Rashad, Zaman, and Khan (2022), sudden resource-price booms frequently hamper long-term economic and sustainable development outcomes because they alter political-economy incentives. When international commodity markets surge, macro-level economic pressures heavily incentivise foreign mining houses to maximise raw ore output for rapid capital repatriation, effectively crowding out investments in domestic manufacturing, fabrication,

and downstream processing. Concurrently, these price spikes inflame micro-level institutional friction, widening the trust gap between state regulators, capital investors, and host communities regarding the equitable distribution of mineral rents.

Taken together, these macroeconomic and governance dimensions highlight a critical research gap. Despite sustained policy discourse on value addition and enhanced stakeholder governance in Zambia's copper industry, limited empirical integration exists between economic determinants, value chain performance and stakeholder satisfaction with governance outcomes. Existing literature either analyses macroeconomic factors in isolation from governance considerations or focuses on participatory engagement without examining how economic structures shape stakeholder expectations and legitimacy claims (Morris et al., 2012; Giurco & Northey, 2014). This thesis addresses this gap by examining the interplay between economic factors, copper value chain participation and stakeholder engagement within a unified analytical framework.

Accordingly, the central research question guiding this thesis is: How do economic factors and stakeholder engagement influence value addition outcomes in Zambia's copper sector? In addressing this question, the study offers a twofold contribution. First, it provides a macroeconomic analysis of the determinants of copper value addition using an econometric model that captures both long-run and short-run effects of key variables such as GDP, inflation, exchange rates and copper prices. Second, it employs a governance economics approach using binary logistic regression to evaluate how stakeholder engagement dynamics shape satisfaction with governance outcomes, emphasising the role of perceived influence rather than mere consultation frequency. By combining economic modelling with institutional legitimacy analysis, the thesis contributes to theoretical and policy debates on resource-based development, value chain upgrading and participatory governance in extractive economies.

In doing so, this study advances a more integrated understanding of how macroeconomic stability and effective stakeholder engagement can together enhance copper value addition and support Zambia's transition from an extractive-dependent model to a more diversified and inclusive mineral-led development pathway. The next section presents the background of the study, providing a detailed historical, economic and institutional overview of Zambia's copper sector to contextualise the empirical and conceptual foundations of the research.

1.1 Background to the Study

Copper production played a pivotal role in Zambia's development plan following its independence. Green (2009) highlights that upon gaining independence in 1964, Zambia was classified as a middle-income nation, largely due to its abundant copper reserves. The country's economic growth is closely intertwined with the performance of the copper industry. As a result, fluctuations in copper production directly impact Zambia's overall economic performance, as evidenced by its economic history (Green, 2009).

Situated strategically in Southern Africa, Zambia's extensive mineral reserves position the nation as a pivotal participant in international mineral commerce, where copper production serves as the foundational driver of long-run economic development (Chileshe & Saasa, 2020). However, this resource endowment has exposed the country to deep structural vulnerabilities across shifting political-economic regimes. The historical transition from the state-controlled ownership models of the 1970s to the aggressive privatisation frameworks of the 1990s influenced by World Bank structural adjustment regulations failed to insulate the economy from external shocks; consequently, despite persistent infrastructure deficiencies, environmental liabilities, and intense commodity price volatility, Zambia remains structurally tethered to copper mining as its primary macroeconomic anchor (Kapalu, 2021).

This vulnerability is reinforced by the linear architecture of the domestic copper value chain, which spans exploration, extraction, processing, and exportation (Milanzi, 2021). While the upstream stages involve intensive capital outlays for deposit assessment and ore extraction (Mwale, 2018), the midstream processing phase comprising crushing, milling, and smelting stops abruptly at the production of primary copper concentrates or unrefined cathodes rather than advancing to downstream manufacturing (Chileshe & Saasa, 2020). Because these primary goods are immediately exported to international markets to sustain domestic GDP and sovereign export earnings (World Bank, 2021), local value retention is systematically minimised.

This asymmetric value chain operates within a highly fragmented institutional arena occupied by diverse stakeholders, including state regulators, multinational mining houses, host communities, civil society organisations, and international entities (Mwale, 2018). As observed by Milanzi et al. (2021), these factions harbor deeply conflicting priorities, creating institutional friction over

regulatory compliance, environmental sustainability, and local livelihood protections. Resolving this friction requires robust stakeholder engagement mechanisms that move beyond symbolic consultation to enforce genuine transparency, corporate accountability, and an equitable distribution of mineral rents (World Bank, 2019). Ultimately, the performance and competitiveness of the sector remain highly sensitive to macroeconomic variables like inflation, exchange rate fluctuations, and global commodity pricing (Chileshe & Saasa, 2020; Kapalu, 2021). Deconstructing this complex interplay between macroeconomic volatility, value-chain truncation, and institutional stakeholder friction is therefore paramount to unlocking sustainable development and structural transformation in Zambia's mining political economy (Milanzi, 2021).

The strategic mandate for copper value addition is structurally embedded within Zambia's Vision 2030 and successive development blueprints, most notably the Seventh (7NDP) and Eighth (8NDP) National Development Plans. These frameworks explicitly prioritise economic diversification, industrialisation, and enhanced governance as the core pillars required to transform Zambia's resource base into broad-based development. However, despite possessing high-grade reserves, competitive domestic production of beneficiated copper products remains constrained, forcing a persistent reliance on raw exports and the structural forfeiture of higher-margin downstream revenues. As targeted within the 8NDP, shifting away from unprocessed ores requires an enabling environment that extends beyond mere mineral endowment. It demands macroeconomic stability, predictable regulatory frameworks, infrastructure efficiency, and participatory governance structures to build stakeholder trust. By strengthening these institutional pillars alongside private-sector skills upgrading, the country aims to deepen copper value-chain integration, drive domestic revenue retention, and fulfil its long-term industrial transformation agenda.

Zambia's downstream involvement in the copper value chain is exemplified by entities like Metal Fabricators of Zambia PLC (ZAMEFA). Founded in 1968 as a state parastatal under the Zambia Industrial and Mining Corporation (ZIMCO), ZAMEFA was privatised in 1996 and subsequently listed on the Lusaka Securities Exchange in 2004 following acquisitions by various multinational industrial groups, including South Africa's Reunert Limited (Kasonde, 2016; ZAMEFA, 2019). Today, ZAMEFA's operations focus on manufacturing copper rods and aluminium electrical conductors for both domestic consumption and regional export markets, demonstrating the

structural potential for local mineral beneficiation. However, the domestic capacity to upscale these operations remains small when contrasted with global copper consumption dynamics. Global demand is overwhelmingly dominated by industrial hubs in the Asia-Pacific region, led by China which commands over 54% of the world's approximately 26 million metric tons of annual refined copper consumption; conversely, the entire African continent accounts for less than 2% of global usage, reinforcing Zambia's systemic exposure as a passive exporter of raw commodities to foreign manufacturing centres (International Copper Study Group [ICSG], 2023).

The government has attempted to address value addition in the mining industry through the 2030 vision and national development plans. Zambia has some of the biggest and highest-grade copper reserves in the world, but it has not been able to produce beneficiated copper products at a price that is competitive (average grade: 2.7%; Kruger, 2013). As a result, it solely receives income from raw copper. If value were to be added, the profits would double or even increase.

According to extant studies like Giurcos and Northey (2014), both internal and external factors contributed to Zambia's failure to apply value addition to the sector. As most of the mines are owned by foreigners, internal regulations have not encouraged value creation. The dependency theory, neo-colonialism ideas, the resource curse, the Dutch Disease, and other theories have all been applied to the external front. Additionally, the trade balance has turned negative and the deficit has grown as a result of decreased Copper production and low Copper prices. Due to the steep devaluation of the kwacha and the significant share of public debt held in foreign currency, the government debt has increased (Prins, 2015). Zambia has a small export base and exports primarily consist of metals; its current account is very vulnerable to falling commodity prices. Zambia has a serious infrastructure deficit that hinders economic progress, especially in the areas of transportation and energy (Prins, 2015). Averaging 3.57 percent with an annual change of 6.36 percent as of 2021 (macrotrends, 2021) despite these factors, Zambia's economic growth has significantly improved.

Accessibility to international markets, the availability of raw materials needed for the beneficiation of copper, alloys, and scrap metal, the availability of capital for plant and equipment, the availability of qualified workers with the necessary skills, and profitability are the main reasons why the value addition concept has not been widely adopted.

The Copperbelt was a thriving urban–industrial hub at the time of independence, forming the backbone of Zambia’s early post-colonial economy. Between the mid-1960s and early 1970s, copper accounted for over 90% of the country’s export earnings (World Bank, 1976), positioning Zambia among the world’s top three copper producers during that period. National copper output peaked at approximately 720,000 metric tonnes in 1972 (UNCTAD, 1974), marking one of the highest production levels in the nation’s history. Employment levels were equally notable: the mining sector directly employed over 62,000 workers at independence, representing nearly 60% of all formal sector jobs (Fraser & Larmer, 2010), while many more were indirectly engaged through subcontracting, manufacturing and Copperbelt municipal services.

Based on economic strength, Zambia was widely regarded as a model for newly independent African states attempting to translate political sovereignty into economic self-sufficiency. Mining revenues financed extensive public services, subsidised urban amenities and supported industrial ventures under the Import Substitution Industrialisation (ISI) strategy, resulting in what Ferguson (1999) referred to as a developmentalist optimism that shaped post-independence planning. The prosperity of the Copperbelt reflected in wage stability, urban expansion and robust state investment thus positioned Zambia as an early exemplar of mineral-driven development aimed at reducing poverty and promoting structural transformation.

In 1969, Zambia, which has one of the highest GDP per capita rates in Africa, was categorised as a middle-income nation (Fraser & Larmer, 2010). For more than 24 years, the government controlled the industry. Production levels drastically decreased throughout the entire nation at this time, reaching their lowest point in 2000 when they were 25 000 tons (Sikamo, et al., 2016). Large-scale commercial copper production in Zambia began in 1929 on the Copperbelt, just as the Great Depression began to reshape global markets. However, during the colonial era, the wealth generated from these operations was primarily exported to foreign capital houses and the British metropolitan treasury. It was only after achieving independence in 1964 that the newly formed sovereign state sought to capture these mineral revenues. Beginning in the late 1960s, the post-colonial government utilised nationalised mining profits to finance successive five-year National Development Plans (NDPs). These strategic plans most notably the First National Development Plan (1966–1970) explicitly aimed to subsidise urban consumers, develop state-owned enterprises

under parastatal frameworks, and rapidly build the nation's nascent economic infrastructure (Bates, 1971).

Due to the extractive economic framework inherited from colonial rule, Zambia continued to operate under a trading system in which copper was marketed through foreign-controlled channels most notably the London Metal Exchange (LME) where international mine owners captured the bulk of profits while the Zambian Treasury received only a fraction of the mineral value. Historical estimates show that during the late colonial and early post-independence period, Zambia retained less than 10% of total copper revenues through taxes and royalties, while foreign mining houses captured over 80–90% through offshore pricing and profit repatriation mechanisms (Fraser & Larmer, 2010; World Bank, 2024).

The staggering asymmetry in global refined copper consumption serves as a stark baseline for evaluating Zambia's structural market access constraints. According to data from the International Copper Study Group (ICSG, 2023), global copper demand is concentrated within major industrial centres, led by China at over 54% (approx. 14.3 million metric tons) and Europe (approx. 3.2 million metric tons). In contrast, the entire African continent accounts for less than 2% of global usage. While these statistics highlight an immense international market for high-value, beneficiated copper products, they simultaneously expose the missed economic opportunities dictated by Zambia's internal Extraction-Export Trap.

This trap is maintained by a severe domestic infrastructure deficit, particularly in the critical sectors of transportation logistics and energy generation (Prins, 2015). Downstream copper fabrication and advanced beneficiation are highly energy-intensive processes that require a stable, high-capacity electricity grid and low operational tariffs. Because Zambia faces persistent energy vulnerabilities and elevated electricity costs, multinational mining operators find it structurally more profitable to avoid local processing altogether. Coupled with inadequate rail and road networks connecting the land-linked nation to regional ports, these logistical bottlenecks make the export of bulky, finished manufactured goods cost-prohibitive. Consequently, private capital naturally defaults to the lower end of the value chain, extracting raw ore or primary copper cathodes and shipping them out via foreign-controlled supply channels to satisfy industrial demand in Asia and Europe.

This structural locking-in directly fuels the extreme current account and macroeconomic vulnerability that characterises the Zambian state (Prins, 2015). Because the nation's export base is narrow and overwhelmingly dominated by primary metals rather than high-margin, value-added products, its entire fiscal architecture remains hypersensitive to external demand shocks and commodity price volatility within those consuming regions. Thus, integrating global consumption data into a structural framework demonstrates that domestic value addition is not merely an industrial ambition, but an urgent macroeconomic necessity required to break the Extraction-Export Trap and insulate the domestic economy from international volatility.

By bridging macro-level econometric modeling (ARDL) with micro-level institutional governance (Logistic Regression), this study intentionally establishes a comprehensive Resource Governance analytical lens. In resource-dependent economies like Zambia, evaluating macroeconomic factors or stakeholder relations in isolation creates analytical blind spots. A robust framework for resource governance requires understanding both the long-run structural determinants of copper value addition and the micro-level institutional dynamics that dictate policy legitimacy. Ultimately, the localised operational realities of ZAMEFA and the broader dynamics of global copper consumption are not isolated phenomena; rather, they form the two foundational pillars of the study's Dual-Track Framework of resource governance. By synthesising these elements at the outset, the thesis maps out the exact economic-institutional friction that dictates Zambia's industrial path.

Under the Institutional Track, the survival and structural stagnation of ZAMEFA across shifting state-led and private-led policy regimes underscores an urgent need for robust institutional coordination and participatory governance. ZAMEFA's vulnerability to foreign acquisition and its subsequent confinement to low-margin primary fabrication demonstrate that mineral endowment alone cannot drive industrial transformation. Instead, the state should possess the institutional capacity to deploy protective regulatory frameworks, enforce local-content compliance, and construct participatory governance platforms that align the strategic interests of multinational mining houses, state ministries, and domestic manufacturers.

Concurrently, under the Economic Track, the massive refined copper consumption statistics of global industrial hubs like China and Europe provide the stark macroeconomic justification for

pursuing aggressive structural diversification. For Zambian fabricators to successfully penetrate these high-demand international markets, domestic mineral processing should be supported by stringent macroeconomic stability. Severe structural distortions such as sudden inflation surges, high domestic energy tariffs, and the steep, volatile fluctuations of the Kwacha directly erode the international price competitiveness of locally beneficiated products.

1.2 Statement of the Problem

Copper has long served as the backbone of Zambia's economy, underpinning export revenues, shaping fiscal policy, and influencing the country's long-term growth trajectory. Yet despite its centrality, the copper sector has struggled to translate mineral wealth into sustained, broad-based, and inclusive development. Persistent macroeconomic pressures including exchange-rate volatility, inflationary spikes, and fiscal instability combined with fluctuations in global copper prices, have repeatedly weakened Zambia's capacity to drive structural transformation and expand value addition (World Bank, 2022; IMF, 2023). For example, during the late 1980s, copper prices collapsed while inflation rose above 100%, leading to severe macroeconomic turbulence that triggered company closures, reduced mining reinvestment, and halted plans for domestic smelting expansion (Ferguson, 1999; Fraser & Larmer, 2010). A second major shock occurred between 1998 and 2000, when global copper prices fell to under US\$1,600 per tonne, prompting the closure and privatisation of Zambia Consolidated Copper Mines (ZCCM). This resulted in the downsizing of over 30,000 mining jobs, widespread fiscal distress, and the postponement of beneficiation projects such as refinery upgrades and wire-rod manufacturing (Fraser & Larmer, 2010; UNCTAD, 2001). More recently, the 2015–2016 commodity downturn coupled with sharp kwacha depreciation, when the currency lost more than 40% of its value in a single year raised the cost of imported machinery and processing inputs, reducing smelter profitability and suspending new investments in value-added manufacturing (World Bank, 2016; IMF, 2017).

At a global level, this analytical deficit within the Zambian context directly challenges and improves the foundational architecture of mainstream resource economics, specifically the Resource Curse Thesis (Auty, 2001) and the classic Dutch Disease model (Corden & Neary, 1982). Traditional Dutch Disease models focus almost exclusively on macroeconomic variables, arguing that resource booms cause automatic currency appreciation that crowds out the domestic

manufacturing sector. Similarly, orthodox Resource Curse literature attributes economic stagnation to state-level rent-seeking and institutional degradation (Acemoglu, Johnson, & Robinson, 2005). However, these global paradigms suffer from a serious omission: they fail to explain the micro-level dynamics of the economics-governance nexus specifically, how the structural capacity for value-chain upgrading is directly dependent on, and reinforced by, micro-institutional legitimacy and stakeholder satisfaction.

Collectively, these episodes demonstrate how Zambia's exposure to global price swings and domestic macroeconomic instability has repeatedly undermined efforts to build a resilient, integrated copper value chain, reinforcing dependence on raw copper exports rather than supporting sustained industrial upgrading. These dynamics have left Zambia vulnerable to external shocks and have limited the country's ability to move beyond dependence on raw copper exports, constraining efforts to diversify the economy and deepen industrial competitiveness (UNCTAD, 2021).

Despite extensive research on copper markets and export performance, important knowledge gaps remain. Much of the existing literature focuses on international price movements and export volumes, but far less attention is paid to how domestic macroeconomic variables GDP growth, inflation, mineral rents, exchange-rate movements, and trade value margins shape copper value addition. Collectively, these cyclical episodes lock Zambia into a structural extraction-export trap, reproducing an acute current account vulnerability that leaves the state hypersensitive to external shocks (UNCTAD, 2021).

Redressing this structural failure requires closing three distinct analytical gaps in current mining literature. Methodologically, existing studies rely heavily on descriptive export statistics rather than modelling copper value addition as an explicit dependent variable; few capture integrated short-run and long-run macroeconomic effects using an Autoregressive Distributed Lag (ARDL) bounds testing framework (Pesaran, Shin, & Smith, 2001). This constitutes a clear methodological gap in the study of Zambia's copper economy.

A theoretical gap also persists. Scholarship often treats economic factors and governance factors as separate spheres, yet evidence from global resource governance demonstrates that value-chain

upgrading and institutional legitimacy are mutually reinforcing (OECD, 2022; UNDP, 2022). Zambia lacks studies that integrate value-chain economics with stakeholder-governance perspectives to explain why value addition remains limited despite decades of reform and investment.

Furthermore, there is a significant knowledge gap on stakeholder engagement and governance legitimacy. Although Zambia participates in EITI and has articulated participatory governance commitments, engagement processes on the ground remain inconsistent, fragmented, and often perceived as tokenistic (EITI, 2022; Chisanga. B, et al., 2025). Little empirical work quantifies how engagement effectiveness, perceived influence, and consultation frequency affect stakeholder satisfaction and legitimacy within the mining sector. Even fewer studies incorporate mixed-methods approaches, combining econometric models with thematic analysis to capture the lived experiences of communities, civil society, labour, government, and mining firms.

This thesis responds to these gaps by examining the interconnected roles of macroeconomic conditions, copper value-chain dynamics, and stakeholder engagement in Zambia's mining sector. By synthesising a Phase One ARDL econometric framework of macroeconomic determinants, a Phase Two binary logistic regression modelling stakeholder governance satisfaction, and a Phase Three qualitative thematic triangulation of lived institutional experiences, this study bridges the economic-governance divide. In doing so, it contributes to academic debates on resource dependence, value-chain upgrading, and governance legitimacy while providing evidence-based insights to support Zambia's efforts to maximise developmental returns from copper, in line with Vision 2030 and the 8th National Development Plan.

1.3 Research Questions

The study addresses the following overarching research questions and sub-questions:

RQ1: What are the short-run and long-run macroeconomic determinants of copper value addition in Zambia?

RQ1.1: How does GDP growth affect copper value addition in Zambia?

RQ1.2: How does inflation affect copper value addition in Zambia?

RQ1.3: How do exchange-rate movements affect copper value addition in Zambia?

RQ1.4: How do copper export volumes affect copper value addition in Zambia?

RQ1.5: How do mineral rents affect copper value addition in Zambia?

RQ1.6: How do international copper prices affect copper value addition in Zambia?

RQ1.7: How do trade value margins affect copper value addition in Zambia?

RQ2: How does stakeholder engagement relate to governance satisfaction in Zambia's copper mining sector?

RQ2.1: How does stakeholder engagement frequency relate to governance satisfaction?

RQ2.2: How does engagement effectiveness relate to governance satisfaction?

RQ2.3: How does perceived stakeholder influence relate to governance satisfaction?

RQ3: What integrated economic and institutional strategies can strengthen copper value addition, stakeholder legitimacy and sustainable development in Zambia?

RQ3.1: What macroeconomic and fiscal measures can support domestic copper value addition?

RQ3.2: What institutional mechanisms can strengthen meaningful stakeholder participation and governance legitimacy?

RQ3.3: How can economic and institutional reforms be integrated to support inclusive value-chain transformation?

The study proffered answers to the following research questions:

- i. What are the short-run and long-run macroeconomic determinants of copper value addition in Zambia when evaluated through an Autoregressive Distributed Lag (ARDL) bounds testing framework?
- ii. How does Stakeholder engagement contribute to governance, transparency, and sustainability in the copper mining industry in Zambia?
- iii. To what extent can integrated policy frameworks such as institutional co-governance mechanisms and synchronised fiscal-industrial strategies systematically mitigate the structural distortions of the Resource-Price Paradox to drive inclusive value-chain transformation in Zambia?

1.4 Research Objectives

The main objective of this study is to analyse the relationship among economic factors, the copper value chain, and stakeholder engagement in Zambia's mining sector, with a focus on how

macroeconomic dynamics and participatory governance jointly influence value addition, industrial performance, and sustainability.

To achieve the main objective, the study pursues the following specific objectives, to:

- i. evaluate the short-run and long-run macroeconomic determinants of copper value addition in Zambia using an Autoregressive Distributed Lag (ARDL) bounds testing framework;
- ii. analyse how stakeholder engagement influences administration, transparency, and long-term sustainability in Zambia's copper extraction sector, with emphasis on the role of participation in shaping governance outcomes; and
- iii. examine the structural potential for integrated policy frameworks such as institutional co-governance mechanisms and synchronised fiscal-industrial strategies to systematically mitigate the Resource-Price Paradox and promote inclusive value-chain transformation in Zambia.

1.5 Research Hypotheses

The various hypotheses tested in this study to achieve the core research objectives are stated below in both their null (H0) and alternative (Ha) forms, organised into cohesive thematic blocks to track the structural logic of the macro-micro framework:

Theme A: Macroeconomic Performance Variables (Objective 1 / ARDL Model)

Hypothesis 1: Gross Domestic Product (GDP)

- H0: Changes in GDP have no significant impact on the various stages of the copper value addition in Zambia.
Ha: Changes in GDP have a significant positive impact on copper value addition in Zambia.

Hypothesis 2: Mineral Rent

- H0: Variations in mineral rent do not significantly influence the profitability of copper value addition.
Ha: Variations in mineral rent significantly influence the profitability of copper value addition.

Hypothesis 3: Copper Price

- H0: Changes in the price of copper do not significantly impact production levels in Zambia's copper value addition.
Ha: Changes in the price of copper significantly impact production levels in Zambia's copper value addition.

Theme B: Monetary & Trade Stability Vectors (Objective 1 / ARDL Model)¹

Hypothesis 4: Inflation Rate

- H0: Changes in the inflation rate have no significant impact on the profitability of copper value addition in Zambia.
Ha: Changes in the inflation rate have a significant adverse impact on the profitability of copper value addition in Zambia.

Hypothesis 5: Exchange Rate

- H0: Exchange rate fluctuations have no significant effect on pricing strategies within the copper value addition.
Ha: Exchange rate fluctuations significantly affect pricing strategies within the copper value addition.

Hypothesis 6: Interest Rate

- H0: Interest rate changes have no significant effect on investment levels in copper value addition.
Ha: Interest rate changes significantly impact investment levels in copper value addition.

Hypothesis 7: Trade Value Margins

¹ **Methodological precedents (examples of recent ARDL applications):** Chisanga, B., Phiri, J., & Osabuohien, E., (2025); Tahar, M.B., Ben Slimane, S. & Houfi, M.A. (2021) 'Commodity prices and economic growth in commodity-dependent countries: New evidence from nonlinear and asymmetric analysis', *Resources Policy*, 72, 102043; Madziwa, L., Pillalamarry, M. & Chatterjee, S. (2023) 'Integrating stochastic mine planning model with ARDL commodity price forecasting', *Resources Policy*, 85, 104014; Phiri, J., Choolwe, V.C., Phiri, P.K., Chiseni, M.C., Simaundu, B.M. & Osabuohien, E. (2024) 'Impact of macroeconomic indicators and regime change on debt stress in Zambia', *PLOS ONE*, 19(10): e0311445.

- H0: Changes in trade value margins do not significantly impact the competitiveness of Zambia's copper value addition.
Ha: Changes in trade value margins significantly enhance the competitiveness of Zambia's copper value addition.²

Theme C: Micro-Institutional Governance Metrics (Objective 2 / Logistic Regression)

Hypothesis 8: Stakeholder Engagement and Transparency

- H0: Stakeholder engagement has no significant influence on transparency in the administration of Zambia's copper mining sector.
Ha: Stakeholder engagement has a significant positive influence on transparency in the administration of Zambia's copper mining sector.

Hypothesis 9: Stakeholder Engagement and Longevity

- H0: Stakeholder engagement does not significantly impact the longevity and operational stability of mining activities in Zambia.
Ha: Stakeholder engagement significantly impacts the longevity and operational stability of mining activities in Zambia.

Hypothesis 10: Stakeholder Engagement and Collaboration

- H0: Stakeholder engagement does not significantly foster openness and collaboration within Zambia's copper mining sector.
Ha: Stakeholder engagement significantly fosters openness and collaboration within Zambia's copper mining sector.³

Theme D: Integrated Macro-Micro Framework Outcomes (Objective 3 / Triangulation)

Hypothesis 11: Inclusive Participation and Economic Benefits

² Analytical Approach (Themes A & B): These hypotheses will be tested using an Autoregressive Distributed Lag (ARDL) model to capture both short-run and long-run relationships between economic variables and copper value-chain performance from 1980 to 2021, following the bounds-testing framework established by Pesaran, Shin and Smith (2001).²

³ Analytical Approach (Theme C): These hypotheses will be evaluated using binary logistic regression to model the probability of stakeholder satisfaction (Governance Satisfaction = 1\$) as a function of engagement dimensions, with robustness checks ensuring model validity

- H0: Synchronised fiscal-industrial and stakeholder co-governance strategies do not significantly enhance the economic benefits of Zambia's copper mining sector.

Ha: Synchronised fiscal-industrial and stakeholder co-governance strategies significantly enhance the economic benefits of Zambia's copper mining sector.

Hypothesis 12: Inclusive Participation and Sustainability

- H0: Synchronised fiscal-industrial and stakeholder co-governance strategies do not significantly mitigate the Resource-Price Paradox to impact sustainability.

Ha: Synchronised fiscal-industrial and stakeholder co-governance strategies significantly mitigate the Resource-Price Paradox to impact sustainability.⁴

Analytical approach: Findings under this objective will be derived primarily from the governance-focused Phase Two analysis, integrating results from the binary logistic regression and the qualitative thematic insights. This approach enables a nuanced interpretation of how engagement effectiveness, perceived influence, and consultation practices shape governance satisfaction and legitimacy within the copper mining sector. The results from Phase Two will then be synthesised with the broader institutional context to generate policy implications that strengthen participatory governance frameworks, enhance accountability, and improve institutional responsiveness across stakeholder groups.

1.6 Significance of the Study

The significance of this study rests in its ability to illuminate the intricate interconnections between economic factors, the copper value chain, and stakeholder engagement in Zambia's mining sector, while contributing to broader theoretical and empirical debates on governance, industrialisation, and resource dependence. By merging macroeconomic analysis with institutional governance perspectives, this research addresses a notable gap in the existing literature where studies often prioritise either market-based determinants or institutional factors, but rarely integrate the two within a unified analytical framework. This dual perspective enables a more comprehensive understanding of how macroeconomic conditions and governance dynamics jointly influence

⁴ Analytical Approach (Theme D): This objective synthesises empirical insights from both the macro-econometric (ARDL) and micro-governance (logistic regression) tracks to evaluate integrated, evidence-driven frameworks capable of promoting long-run value-chain transformation.

value addition, competitiveness, and sustainability within Zambia's copper industry, and by extension, in other resource-dependent economies.

From a national policy perspective, the findings of this study hold direct relevance for economic management, industrial diversification, and sustainable resource governance.¹ By clarifying how key economic factors such as GDP growth, inflation, exchange rate movements, and mineral rents affect copper value addition, the research provides evidence-based insights for designing coherent industrial, fiscal, and monetary policies. These insights can enhance Zambia's capacity to withstand global commodity price volatility, strengthen domestic linkages within the mining sector, and promote economic stability. Moreover, by revealing how stakeholder engagement shapes transparency, accountability, and legitimacy, the study contributes to understanding the governance reforms necessary for equitable and participatory management of natural resources. The dual emphasis on economic performance and institutional legitimacy underscores the need for integrated policy approaches that foster both industrial efficiency and inclusive governance.

Beyond its public policy contributions, the significance of this study extends directly into the domains of project finance, asset economics, and multinational corporate strategy. Downstream mineral processing facilities such as copper refineries, automated smelters, and specialised wire-rod manufacturing plants are fundamentally distinct from standard extractive operations due to their immense capital intensity, long gestation periods, and highly irreversible, asset-specific sunk costs. Consequently, the commercial viability of deploying long-term Capital Expenditure (CapEx) into localised value addition is directly determined by the macroeconomic structural determinants evaluated in this study's Phase One ARDL model.

From an investor risk analysis perspective, macroeconomic stability serves as a critical structural prerequisite for capital optimisation. In highly volatile economic environments characterised by sudden inflationary spikes and severe exchange rate devaluations, the financial risk premium assigned to a host country escalates dramatically. This volatility directly deforms a firm's capital-budgeting models by inflating its Weighted Average Cost of Capital (WACC). When the cost of debt and equity rises due to sovereign risk, the hurdle rates for local projects become prohibitively high, depressing the Net Present Value (NPV) of downstream investments and causing

multinational boards to shelve value-addition initiatives in favour of short-term, low-processing extraction.

Conversely, this research is commercially significant because it maps the exact macroeconomic thresholds required to foster predictable investment horizons. In a stable, empirically verified macroeconomic environment, financial risk is suppressed, allowing corporate treasurers to secure long-term, non-recourse project financing at competitive rates. Predictable inflation and stable trade value margins reduce operational expenditure (OpEx) uncertainty, enabling corporate planners to project future cash flows with structural confidence. By demonstrating how the stabilisation of monetary and fiscal variables directly correlates with an investor's capacity to absorb long-term risk, this thesis provides global mining houses, institutional lenders, and sovereign wealth funds with a rigorous econometric blueprint to calculate investment safety margins, ultimately proving that macroeconomic predictability is the foundational anchor for deep industrial transformation.

The relevance of this study aligns closely with the strategic pillars of Zambia's Eighth National Development Plan (2022–2026), particularly its focus on economic transformation, value addition, strengthened macroeconomic stability, and improved governance and stakeholder participation. Its findings also offer timely evidence to inform the design of the Ninth National Development Plan, which is expected to further emphasise industrial diversification, enhanced mineral beneficiation, and institutional accountability as part of Zambia's long-term development trajectory.

Academically, the study contributes to the advancement of sustainable resource economics by integrating four theoretical lenses Stakeholder Theory, Legitimacy Theory, Resource Dependence Theory, and the Dutch Disease Model into a unified framework that explains the interplay between macroeconomic performance, institutional engagement, and developmental outcomes. This theoretical synthesis not only enhances scholarly understanding of resource-dependent economies but also provides a conceptual model applicable to other African and developing-country contexts where mineral wealth coexists with governance challenges.

Ultimately, the study's significance lies in its ability to generate evidence-driven pathways for improving Zambia's copper sector governance and value-chain performance, bridging the gap between economic policy design and participatory institutional reform. It advances a model where economic stability supports inclusive governance, and governance legitimacy reinforces economic competitiveness creating a virtuous cycle of sustainable growth.

The study also underscores the centrality of sustainability as both an outcome and a guiding principle for Zambia's copper sector. By examining the balance between economic efficiency and governance legitimacy, the research identifies strategies that simultaneously enhance value addition and promote responsible mining practices. This integrated approach acknowledges that sustainable industrial growth cannot be achieved without addressing environmental stewardship, equitable benefit distribution, and social accountability. Understanding these interconnections will help mitigate the environmental impacts of mining while ensuring that the economic gains from copper production are shared more broadly among Zambian communities. In doing so, the study contributes to a framework for long-term resource management that fosters both social stability and intergenerational equity.

In addition, the research makes a significant academic contribution to the field of development economics and resource governance. Through the use of an explanatory mixed-methods design, combining econometric modelling and governance analysis, it extends empirical inquiry into how macroeconomic forces and institutional processes interact within extractive industries. The study advances an integrated analytical framework that links economic dynamics with governance mechanisms, offering new insights into the causal relationships and underlying mechanisms shaping outcomes along Zambia's copper value chain. This theoretical and empirical integration enriches scholarly understanding of how economic policy, institutional legitimacy, and stakeholder engagement collectively determine development trajectories in resource-dependent economies. It also provides a foundation for comparative research across other mineral-rich contexts in Africa and beyond.

In sum, the significance of this study is multifaceted. For policymakers, it offers evidence-based insights to optimise the developmental contribution of copper by aligning macroeconomic stability with participatory governance reforms. For industry actors, it identifies strategies to improve

competitiveness and foster technological upgrading within the value chain. For local communities and civil society, it highlights the importance of meaningful and inclusive stakeholder engagement as a pathway to equitable benefit-sharing and transparency. For academia, it enriches the evolving discourse at the intersection of economics, governance, and sustainability, illustrating how integrated analytical approaches can illuminate the complex realities of extractive economies.

By focusing on Zambia's copper sector, a commodity that remains vital not only to the national economy but also to global industries such as construction, electronics, and renewable energy this research situates itself at the centre of contemporary debates on how natural resources can be harnessed for inclusive, equitable, and sustainable development in the 21st Century.

1.7 Scope and Delimitation of the Study

This study is delimited to an examination of the interrelationship between economic factors, the copper value chain, and stakeholder engagement within Zambia's mining sector. The research focuses specifically on the period 1980 to 2021, a timeframe characterised by significant policy transitions, including nationalisation, privatisation, and the adoption of liberal market reforms. These structural shifts make the period particularly relevant for analysing long-term trends in copper production, value addition, and governance outcomes. The temporal scope of this study is bound between 1980 and 2021, a forty-one-year macroeconomic window that provides the necessary statistical degrees of freedom required for robust Autoregressive Distributed Lag (ARDL) bounds testing. Rather than an arbitrary baseline dictated by convenience, the selection of 1980 as the definitive starting point is rigorously justified by two compounding factors: a fundamental political-economic structural shift and international data standardisation thresholds.

Historically, 1980 marks a clean structural break from the immediate post-independence era (1964–1979). The initial fifteen years following Zambia's independence were characterised by an aggressive, state-led import substitution industrialisation (ISI) model financed by an initial global copper boom. However, the dual impact of the 1973 and 1979 global oil shocks, coupled with a concurrent collapse in international copper prices, fundamentally exhausted this state-capitalist framework. By 1980, Zambia entered a prolonged period of fiscal distress, marking the formal onset of the Sub-Saharan African debt crisis and forcing the state into its inaugural structural negotiations with the International Monetary Fund (IMF) and the World Bank. Thus, limiting the

econometric analysis to the post-1980 window captures the modern era of structural adjustment, privatisation, and liberalisation, distinguishing it from the highly anomalous, state-subsidised economic architectures of the 1960s and 1970s.

Methodologically, 1980 represents a vital data-standardisation threshold. Prior to 1980, domestic mineral accounting, trade value margins, and national income metrics were recorded using fragmented, colonial-transition methodologies that suffer from significant missing data entries and calculation discrepancies. In 1980, the World Bank's World Development Indicators (WDI), the IMF, and the United Nations Conference on Trade and Development (UNCTAD) harmonised their statistical tracking systems for primary commodity exporters. By starting the time series at 1980, the study ensures absolute continuity and methodological symmetry across all tested independent variables (such as mineral rents, real exchange rates, and trade margins). This safeguards the ARDL model from severe measurement errors and artificial structural shocks that would otherwise compromise the asymptotic properties of the bounds-testing framework.

The scope of the study is defined along three key dimensions: thematic, geographical, and methodological. Thematically, the research concentrates on how macroeconomic variables namely Gross Domestic Product (GDP), inflation rate, exchange rate, interest rate, trade value margins, mineral rents, and copper prices influence the performance of Zambia's copper value chain across stages such as extraction, processing, and export. In parallel, it explores how stakeholder engagement measured through dimensions such as frequency, effectiveness, independence, and transparency affect governance legitimacy, administrative efficiency, and long-term sustainability in the sector.

Geographically, the study centres on Zambia, with particular attention to the Copperbelt and North-Western Provinces, which host the country's largest mining operations, including Konkola Copper Mines, Mopani Copper Mines, Kansanshi, and Lumwana. These regions provide a rich empirical context for understanding both the economic significance of copper and the social and governance dynamics surrounding mining activities.

Methodologically, the research adopts an explanatory mixed-methods design that integrates econometric and institutional analyses. The quantitative component employs an Autoregressive

Distributed Lag (ARDL) model to examine short-run and long-run relationships between macroeconomic factors and copper value addition. The institutional component applies binary logistic regression to model the influence of stakeholder engagement on governance satisfaction and legitimacy. Data sources include secondary macroeconomic data from the World Bank, IMF, and Zambia Statistics Agency (ZamStats), complemented by primary data collected from mining sector stakeholders through structured surveys and interviews.

While the study provides a comprehensive analysis of the economic and governance dimensions of Zambia's copper sector, it is delimited by its national focus and its reliance on available datasets. The research does not extend to comparative analyses with other mineral sectors or cross-country contexts, though the findings may hold transferable insights for other resource-dependent economies. Additionally, the study does not conduct an environmental impact assessment but acknowledges sustainability and environmental stewardship as integral aspects of governance legitimacy.

To ensure absolute econometric and conceptual clarity, the dependent variable Copper Value Addition (CVA) is strictly operationalised based on specific stages within the mineral beneficiation spectrum. Value addition in the metallurgical sector is not a monolithic category; rather, it progresses through linear, increasingly complex industrial stages. This study explicitly defines the boundaries of what is quantitatively measured within the Phase One econometric model to eliminate ambiguity regarding data inputs.

Processes Included in the Quantitative Model:

The econometric time-series data utilises national-level industrial accounts that track Primary and Secondary Beneficiation. This encompasses:

Smelting: The pyrometallurgical transformation of copper concentrates into copper blister or anodes (98.5% to 99.5% purity).

Electrolytic Refining: The chemical processing of anodes to produce high-grade copper cathodes (99.99% purity).

Primary Transformation/Fabrication: The mechanical conversion of refined cathodes into basic intermediate industrial shapes, specifically high-conductivity copper wire-rods, billets, bars, and uninsulated strip conductors (as processed domestically by entities like ZAMEFA).

Processes Excluded from the Quantitative Model:

Conversely, Tertiary Beneficiation and Advanced Downstream Manufacturing are explicitly excluded from the mathematical boundaries of the ARDL model. These exclusions comprise:

Highly specialised, end-user industrial manufacturing, including the fabrication of insulated multi-core telecommunication cables, fiber-optic hybrid wiring, automotive wiring harnesses, transformers, electric motor rotors, and micro-electronic circuit components.

This precise boundary is dictated by both domestic data constraints and the empirical reality of the Zambian industrial landscape. Because Zambia's manufacturing sector has historically been structurally constrained from advancing to tertiary engineering, tracking advanced electronics assembly within a forty-year continuous time series is statistically unfeasible. Consequently, the quantitative models in this thesis measure the macroeconomic and governance determinants of the transition from raw extraction to primary/secondary metal processing, ensuring that the empirical conclusions directly match the operational boundaries of the data.

Despite these delimitations, the scope of the study remains sufficiently broad to capture the macroeconomic, institutional, and participatory variables necessary to explain Zambia's copper value chain dynamics. The integration of economic and governance perspectives ensures that the analysis contributes both theoretically and practically to ongoing discussions on sustainable resource management and industrial transformation in developing economies.

1.8 Definition of Key terms

Accountability:

The obligation of public institutions, corporate entities, and individuals to report, explain, and take responsibility for their actions. In mining governance, accountability refers to mechanisms ensuring that decision-makers are answerable for the management of mineral resources, fiscal

revenues, and community impacts.

Source: OECD (2015); EITI (2021).

Autoregressive Distributed Lag (ARDL) Model:

An econometric approach that captures both short-run and long-run relationships among variables in time-series data, even when variables are integrated of different orders.

Source: Pesaran, Shin & Smith (2001).

Beneficiation (Value Addition):

The process of increasing the economic value of mined copper through processing, smelting, refining, or fabricating into finished/semi-finished goods.

Source: UNCTAD (2020); African Mining Vision (AU, 2009).

Binary Logistic Regression:

A statistical technique used to model the probability of a binary outcome (e.g., stakeholder satisfaction vs. dissatisfaction) using predictor variables.

Source: Hosmer, Lemeshow & Sturdivant (2013).

Competitiveness:

The ability of a country or sector to produce goods that meet global standards while improving citizens' incomes. In copper mining, competitiveness reflects cost structures, productivity, technology, and exchange-rate stability.

Source: World Economic Forum (2022).

Copper Price:

The global market price of copper, usually quoted from the London Metal Exchange (LME).

Source: LME (2023).

Copper Value Chain:

A sequence of interconnected activities transforming copper ore into tradable commodities; exploration, extraction, concentration, smelting, refining, fabrication, and export.

Source: Kaplinsky & Morris (2016).

Corporate Governance:

The systems, rules, and processes that direct and control corporations, including compliance, management accountability, and stakeholder protection.

Source: OECD Principles of Corporate Governance (2015).

Development Outcomes:

The socio-economic and environmental results of mining governance, including employment, fiscal revenues, transparency, environmental protection, and sustainability.

Source: UNDP (2021).

Dutch Disease:

A macroeconomic condition where resource booms appreciate the real exchange rate, reducing competitiveness in non-resource sectors.

Source: Corden & Neary (1982).

Economic Factors:

Macroeconomic determinants influencing copper sector performance; GDP growth, inflation, exchange rate, interest rate, mineral rents, and copper prices.

Source: IMF (2023); World Bank (2022).

Economic Growth (GDP Growth):

An increase in the value of goods and services produced in a country over time.

Source: World Bank (2023).

Exchange Rate:

The price of the Zambian kwacha relative to foreign currencies, influencing export earnings and investment costs.

Source: Bank of Zambia (2023).

Fiscal Policy:

Government decisions on taxation and public spending that shape economic activity, including management of mineral revenues.

Source: IMF Fiscal Affairs Department (2022).

Governance:

The processes and structures for exercising authority, managing resources, and ensuring accountability and participation.

Source: World Bank Governance Indicators (2022).

Governance Legitimacy:

Stakeholder perceptions that governance processes are fair, transparent, and socially acceptable.

Source: Suchman (1995).

Human Capital:

Skills, knowledge, and competencies that enhance productivity.

Source: Becker (1993).

Independence (Stakeholder Engagement):

The degree to which stakeholder processes operate free from undue political or corporate influence.

Source: Reed (2008).

Inflation Rate:

The annual rate of increase in general prices.

Source: IMF (2023).

Institutional Capacity:

The ability of government agencies to design, implement, and monitor policy effectively.

Source: Grindle (1996).

Interest Rate:

The cost of borrowing money or the return on savings.

Source: Bank of Zambia (2023).

Legitimacy Theory:

A theory asserting that institutions succeed when their actions align with societal norms and

expectations.

Source: Suchman (1995).

Local Linkages:

Domestic economic connections created by mining, including supply chains, employment, and technology transfer.

Source: UNIDO (2020).

Macroeconomic Stability:

A condition of low inflation, fiscal balance, and stable exchange rates that supports investment.

Source: IMF (2022).

Mineral Rents:

Revenue from extracting minerals after subtracting production costs.

Source: World Bank (2021).

Mining Governance:

The regulatory, policy, and institutional framework guiding mining operations.

Source: EITI (2021).

Participation:

Stakeholder involvement in decision-making on mining policy and practices.

Source: Arnstein (1969); Reed (2008).

Perceived Influence:

Stakeholder belief in their power to affect policy or operational decisions.

Source: Moffat & Zhang (2014).

Policy Framework:

The set of laws, regulations, and strategies guiding decisions in the mining sector.

Source: African Mining Vision (AU, 2009).

Profitability:

The extent to which mining generates financial surplus.

Source: UNCTAD (2020).

Resource Curse:

The paradox where resource-rich countries experience weak development outcomes due to volatility, rent-seeking, and governance failures.

Source: Auty (1993); Sachs & Warner (1995).

Resource Dependence Theory:

A theory positing that institutions dependent on external resources are shaped by those who control those resources.

Source: Pfeffer & Salancik (1978).

Sustainability:

Meeting present needs without compromising environmental or social wellbeing for future generations.

Source: WCED (1987) – Brundtland Report.

Social License to Operate (SLO):

The informal, ongoing approval granted by communities based on trust and legitimacy.

Source: Bice & Moffat (2014).

Stakeholder Engagement:

Structured interaction among organisations and affected parties to exchange information, align expectations, and make decisions.

Source: Reed (2008); Kemp & Owen (2013).

Stakeholder Theory:

A theory proposing that organisations succeed when they address the interests of all stakeholders.

Source: Freeman (1984).

Structural Transformation:

Shift from low-productivity to high-productivity sectors such as manufacturing.

Source: McMillan & Rodrik (2011).

Trade Value Margin:

The difference between export selling price and domestic production cost of copper.

Source: OECD (2020).

Transparency:

Open availability of information on decisions, revenues, and processes.

Source: EITI (2021).

Value Addition:

The degree of domestic transformation of copper before export.

Source: UNCTAD (2020).

Volatility:

The degree of variability in economic indicators such as prices or exchange rates.

Source: IMF (2022).

ZAMEFA (Metal Fabricators of Zambia Plc):

A leading Zambian manufacturer of copper rods and conductors.

Source: ZAMEFA Annual Report (2023).

ZCCM-IH:

A state-owned investment company holding mining assets on behalf of the government.

Source: ZCCM-IH Annual Report (2023).

1.9 Organisation of the Thesis

The thesis is organised into six chapters. Chapter One introduces the study by presenting the background, statement of the problem, research objectives, research questions, hypotheses, significance, scope and key definitions. It establishes the rationale for examining the relationship

between macroeconomic conditions, copper value addition and stakeholder engagement in Zambia's mining sector.

Chapter Two reviews the relevant theoretical and empirical literature on resource dependence, stakeholder engagement, legitimacy, Dutch Disease, resource governance and copper value-chain development. The chapter identifies the principal theoretical and empirical gaps that motivate the study.

Chapter Three presents the theoretical and conceptual framework. It integrates the four theoretical perspectives underpinning the study and develops the Economic–Institutional Feedback Loop that links the macroeconomic and governance dimensions of Zambia's copper sector.

Chapter Four presents the research design and methodology, including the pragmatic mixed-methods approach, data sources, sampling procedures, variable operationalisation, ARDL bounds-testing model, binary logistic regression model, qualitative thematic analysis and diagnostic procedures.

Chapter Five presents and discusses the empirical findings. It reports the descriptive statistics, stationarity and structural-break tests, ARDL bounds-testing results, long-run and short-run estimates, diagnostic and stability tests, stakeholder descriptive statistics, correlation analysis, binary logistic regression results, classification diagnostics and thematic findings.

Chapter Six concludes the thesis by synthesising the major findings, drawing conclusions, presenting policy recommendations and discussing the contribution to knowledge, limitations and areas for further research.

CHAPTER TWO:

LITERATURE REVIEW

2.0 Introduction

The empirical studies reviewed shed light on the intricate relationship between economic factors, the copper value chain, and stakeholder engagement in Zambia's mining sector. Value addition is widely recognised as a mechanism that increases the marginal value of a product, enhances producer revenue, and strengthens income generation across the value chain. It also expands consumer demand by improving product quality, marketability, and durability (UNIDO, 2022). In the broader development literature, value addition is associated with reduced post-production losses, increased competitiveness, and improved integration into global value chains (UNCTAD, 2021).

Despite the central role of copper in Zambia's economy and its importance in the global green-energy transition, the literature reveals persistent gaps in understanding how domestic economic conditions particularly GDP growth, inflation, exchange-rate movements, mineral rents, and export performance shape various stages of the copper value chain. Existing studies tend to focus on export performance and external price shocks, offering limited insight into the structural, institutional, and governance factors that influence value addition within Zambia (World Bank, 2022).

Approaches to sustainability have also evolved, shifting from a narrow focus on conserving resources toward a model of continuous positive value creation across economic, social, and environmental domains. This triple bottom line perspective people, planet, and profit is increasingly used to assess mining-sector sustainability (KPMG, 2021; OECD, 2022). Within this framework, mining companies are expected not only to maintain viable operations but also to utilise resources efficiently, promote environmental regeneration, and contribute to broader socio-economic development.

Mining and minerals processing industries have thus become central to development debates, particularly in countries where natural resources are major contributors to GDP, employment and fiscal revenues. In resource-dependent contexts such as Zambia, the mining sector underpins

government revenue, industrial linkages, and livelihoods, underscoring the need for rigorous economic analysis of how macroeconomic factors and institutional conditions shape value addition and the distribution of benefits (UNDP, 2022; EITI, 2022). This study therefore reviews the economic and institutional factors influencing the copper value chain to conceptualise a sustainability model suited to Zambia's development needs.

2.0.1 Structural Roadmap of the Chapter

To maintain analytical tracking and ensure absolute directional clarity, this chapter is organised into three progressive, interconnected divisions.

The chapter establishes the study's foundational Theoretical Framework, executing a rigorous, critical interrogation of its four anchoring pillars: Stakeholder Theory, Legitimacy Theory, Resource Dependence Theory, and the Dutch Disease Model. Rather than presenting these paradigms as static axioms, this section exposes their operational boundaries and limitations. The study transitions to a three-Part Empirical Review structured directly around the study's core factors. This section evaluates historical and contemporary scholarship regarding: (a) the macroeconomic determinants of downstream mineral beneficiation, (b) the micro-institutional dynamics of stakeholder participation within the mining sector, and (c) the structural infrastructure and trade bottlenecks constraining African mineral upgrading. The chapter culminates in a comprehensive Knowledge Gap and Synthesised Research Matrix. This division explicitly maps out how prior research has remained epistemologically polarised, directly justifying this study's integrated, mixed-methods macro-micro econometric and logistic intervention.

2.1 THEORETICAL REVIEW

This study is anchored in four complementary theoretical perspectives. Stakeholder Theory, Legitimacy Theory, Resource Dependence Theory, and the Dutch Disease Model. Together, these theories provide a robust foundation for understanding how macroeconomic performance, governance structures, and stakeholder engagement interact to determine copper-sector outcomes in Zambia's resource-dependent economy.

2.1.1 Stakeholder Theory

Stakeholder Theory originated with Freeman (1984), who posited that organisational performance and legitimacy depend on recognising and addressing the interests of all actors affected by organisational activity. In mining, stakeholders include government agencies, mining companies, employees, civil-society organisations, host communities, and international investors.

Within this study, Stakeholder Theory offers an institutional lens for interpreting how engagement processes influence governance outcomes. Effective engagement enhances transparency, reduces conflict, and fosters mutual accountability conditions that improve both economic outcomes and social stability (Reed, 2008; Kemp & Owen, 2013). Conversely, exclusionary or tokenistic engagement erodes trust, weakens institutional credibility, and increases operational risks.

Thus, Stakeholder Theory underpins the argument that participatory governance mechanisms support sustainable value-chain performance by strengthening the social licence to operate.

Thus, Stakeholder Theory provides the theoretical basis for treating engagement as an important institutional mechanism through which participation, legitimacy and social licence to operate may shape sustainable value-chain outcomes. In this thesis, this relationship is interpreted theoretically and is not estimated as a formal mediation or moderation effect.

2.1.2 Legitimacy Theory

Legitimacy Theory (Suchman, 1995) complements stakeholder theory by explaining how organisational or institutional actions gain acceptance within a given social context. It posits that entities operate successfully only when their conduct aligns with the norms, values, and expectations of society. In the mining context, legitimacy extends beyond regulatory compliance to include moral and pragmatic dimensions fairness, transparency, and responsiveness to community concerns (Bice & Moffat, 2014).

Applied to Zambia's copper industry, legitimacy theory explains why governance structures that embed meaningful stakeholder participation gain stronger public support and policy continuity. When engagement processes are transparent and outcomes demonstrably fair, stakeholders perceive the system as legitimate, which stabilises the governance environment.

In the conceptual framework, legitimacy functions as an institutional outcome associated with stakeholder engagement and governance performance. The quality of stakeholder interaction is therefore treated as a theoretical conditioning mechanism within the integrated framework rather than as a formally estimated interaction effect.

2.1.3 Resource Dependence Theory

The Resource Dependence Theory (RDT), originally developed by Pfeffer and Salancik (1978), posits that organisations and by extension, economies depend on external resources for survival. These dependencies shape power relations, strategy, and institutional behaviour. In Zambia's case, the national economy is heavily dependent on copper revenues, exposing it to external market shocks and price volatility. This dependence influences policy design, fiscal stability, and even stakeholder relations within the mining sector.

RDT provides the economic rationale for analysing how macroeconomic factors (GDP growth, inflation, exchange rate, mineral rents) shape industrial competitiveness and stakeholder engagement. For instance, periods of high copper prices increase fiscal capacity, which can strengthen institutional resources for governance and community investment. However, over-dependence also concentrates power within state and corporate actors, marginalising local stakeholders and reinforcing structural inequalities.

Therefore, RDT supports the argument that reducing dependency through value addition and diversification is crucial for achieving both economic resilience and institutional balance.

2.1.4 The Dutch Disease Model

The Dutch Disease Model explains how resource booms can harm a country's industrial competitiveness. Large inflows of foreign exchange from resource exports appreciate the real exchange rate, making domestic manufacturing less competitive and reinforcing dependence on raw commodity exports (Corden & Neary, 1982).

In Zambia, copper price booms have historically encouraged raw exportation, weakening incentives for beneficiation and manufacturing. The appreciation of the kwacha during high-price

periods has often reduced competitiveness in non-copper sectors and stunted broader industrial growth (Fraser & Larmer, 2010; World Bank, 2016).

The model therefore justifies the study's focus on macroeconomic stabilisation particularly exchange-rate management, inflation control, and prudent mineral revenue use as essential for sustaining copper value addition.

2.1.5 Theoretical Integration

These four theories converge to illuminate the complex and interdependent relationships that define Zambia's copper-based economy. Stakeholder Theory and Legitimacy Theory together explain the institutional and governance dimensions of the study, particularly how participatory engagement, transparency, and perceptions of fairness contribute to social stability and policy credibility. When stakeholders are actively involved in decision-making and view governance systems as legitimate, institutions tend to function more effectively, fostering accountability and reducing conflict.

The Operational Vagueness and Power Blindness of Stakeholder Theory

While Stakeholder Theory (Freeman, 1984) provides a useful conceptual framework for identifying non-market actors, its classic formulation suffers from a profound lack of operational definition. The theory treats stakeholders as a broad, harmonious ecosystem, which obscures the sharp power asymmetries and inherent class struggles of resource capitalism. It fails to establish a clear hierarchy or mathematical weighting mechanism for handling directly competing claims.

In Zambia's copper sector, the strategic priorities of international capital providers (such as maximising untaxed dividend repatriation and minimising local regulatory friction) exist in direct opposition to the survival requirements of host communities (such as demanding local-content employment, environmental remediation, and direct fiscal resource distribution). Classic stakeholder formulations offer no guidance on how to resolve these zero-sum resource conflicts when corporate alignment with community expectations threatens the financial internal rate of return (IRR) required to keep capital deployed. This thesis addresses this limitation by using binary logistic regression to convert qualitative stakeholder claims into clear, operationalised probability vectors.

The Tautological Traps of Legitimacy Theory

Legitimacy Theory (Suchman, 1995) operates on the assumption that corporations will dynamically alter their core behaviors to maintain an unwritten social contract. However, a key critique of this model is its highly tautological nature: it often measures legitimacy through a firm's self-reported corporate social responsibility (CSR) marketing and public relations disclosures, rather than verified structural shifts in processing or ownership.

In highly dependent mineral economies, multinational enterprises frequently exploit these visibility mechanisms to manufacture a facade of institutional compliance while keeping their highly extractive, raw-export operational models completely intact. The theory fails to account for how structural institutional deficits within the host state prevent local communities from effectively revoking a firm's Social License to Operate (SLO) when corporate actions violate local standards. This study bypasses this tautology by linking subjective stakeholder legitimacy scores back to hard macroeconomic variables within a systemic feedback loop.

Structural Flaws of the Dutch Disease Model in the Green Metal Era

The classic Dutch Disease model (Corden & Neary, 1982) is highly deterministic, arguing that a primary commodity boom automates a real currency appreciation that inevitably destroys the competitiveness of the non-resource manufacturing sector. While historically accurate for traditional commodity cycles, this framework is structurally insufficient for explaining contemporary Green Metal transition dynamics.

In the modern global decarbonisation economy, copper has shifted from a basic cyclical export commodity to a critical strategic asset required for global electrification, electric vehicles (EVs), and renewable energy grids.

Under classic Dutch Disease assumptions, a global copper boom should trigger massive domestic currency overvaluation and automatically choke off downstream value addition by driving up local production costs. However, contemporary green metal dynamics create a different structural paradox: massive, mandatory global demand for the metal coexists with acute localised infrastructure deficits, energy shortages, and severe sovereign debt constraints within the host country. Consequently, the expected domestic currency appreciation may be completely

suppressed by macro-debt crises, while the state simultaneously faces intense geopolitical pressure to enforce localised value addition. Classic Dutch Disease models are blind to these green-transition mandates and fail to capture how micro-level institutional co-governance can act as a stabilising mechanism to shield downstream fabrication margins from macro-monetary shocks.

Synthesised Theoretical Integration: The Polarised Research Gaps

An evaluation of the existing body of empirical literature on Zambia's mineral political economy reveals a systemic omission that directly validates the core premise of this study: a comprehensive integration of macroeconomic value-addition determinants and micro-level stakeholder governance legitimacy has simply not been done.

To date, the academic landscape remains sharply polarised into two insular, non-communicating research trajectories. The first trajectory is strictly econometric and macroeconomic. Scholars within this domain have extensively modelled Zambia's aggregate trade volumes, export performance, and tax regimes using various time-series architectures (Ndulo & Mudenda, 2018; Siwale & Chibwe, 2021). While these studies offer precise insights into how external pricing shocks affect state revenues, they treat the domestic value chain as a static, black-box entity. They consistently fail to model value addition as an explicit dependent variable, and completely omit the micro-institutional realities such as regulatory compliance costs and stakeholder friction that dictate whether private mining houses actually deploy capital into local processing facilities.

The second trajectory operates at the opposite extreme, focusing entirely on descriptive sociological and institutional analyses of the mining sector. This body of work critiques the historical transition of ownership, community displacement, corporate social responsibility (CSR) failures, and the tokenistic nature of local consultation mechanisms (Lungu, 2019; Banda & Mamba, 2022). Yet, these institutional critiques suffer from a profound lack of macroeconomic grounding. They evaluate stakeholder dissatisfaction and governance legitimacy in a vacuum, entirely decoupled from the hard fiscal realities, inflationary pressures, and real exchange rate fluctuations that constrain both state regulatory enforcement and corporate investment capacity.

Consequently, prior to this thesis, no study has bridged this divide to evaluate how macroeconomic stability and localised institutional legitimacy dynamically reinforce one another. The literature

lacks any framework that quantifies stakeholder engagement probabilities while simultaneously mapping long-run macroeconomic bounds thresholds. By leaving these spheres disconnected, previous research has been structurally incapable of explaining why decades of mining reforms have failed to catalyze downstream industrialisation. This study directly addresses this profound academic void, providing the first integrated, mixed-methods nexus designed to show how macro-shocks and micro-legitimacy converge to dictate the success or failure of Zambia's value-chain transformation.

Integrating these perspectives, the study constructs a dual theoretical foundation. The economic dimension focuses on analysing macro-level determinants of value addition and competitiveness, while the institutional dimension examines governance legitimacy and stakeholder participation as mechanisms through which sustainable outcomes may be strengthened in the mining sector. Together, these theoretical strands provide the rationale for the study's dual-method approach, which combines econometric analysis of macroeconomic variables with logistic modelling of governance dynamics. This synthesis situates the research within the broader discourse of sustainable resource economics, highlighting the intertwined nature of economic performance and institutional legitimacy in Zambia's pursuit of inclusive and resilient growth.

The concept of stakeholder engagement is rooted in Freeman's (1984) Stakeholder Theory, which defines stakeholders as any group or individual who can affect or is affected by the achievement of an organisation's objectives. This framework reshaped organisational thinking by expanding the focus from shareholders alone to a wider network of actors including government bodies, employees, customers, suppliers, and local communities whose interests collectively shape outcomes. In the mining sector, this multi-actor orientation is critical due to the intricate web of social, economic, and environmental interdependencies surrounding resource extraction.

In Zambia's copper industry, stakeholders include not only mining corporations and state institutions but also traditional leaders, civil society, and affected communities. Their interests are often divergent: government seeks revenue and employment, companies pursue profit, while communities demand social and environmental protection. The complexity of these relationships underscores the need for structured engagement mechanisms to manage power asymmetries and competing priorities (Reed, 2008; Kemp & Owen, 2013).

2.2 Empirical Literature Review

2.2.1 Theoretical Tension: The Substantive vs. Symbolic Power Debate in Resource Governance

Empirical studies consistently show that meaningful stakeholder engagement enhances governance outcomes in extractive industries. Foundational work by Reed (2008) and Kemp and Owen (2013) demonstrates that participatory engagement deepens trust, improves compliance with regulatory processes, and strengthens sustainability practices. Hilson (2002) similarly finds that transparent and well-structured engagement mechanisms help reduce land-related conflicts and improve regulatory oversight. Further evidence from Bice and Moffat (2014) shows that strong community relations not only improve operational stability but also reinforce a mining company's social licence to operate.

When evaluating stakeholder engagement within extractive regimes, empirical scholarship is deeply divided by an underlying ideological tension regarding the true function of participatory platforms. Rather than a simple consensus on the operational utility of engagement, a major academic debate pits scholar who view these mechanisms as tools for Symbolic/Procedural Legitimacy against those who argue they can facilitate Substantive/Tangible Influence. This tension is critical because it dictates whether participatory spaces serve to empower local actors or merely to shield corporate capital from local resistance.

On one side of this theoretical tension, a prominent school of critical political economists argues that corporate stakeholder engagement is fundamentally symbolic and designed to secure mere procedural legitimacy without redistributing actual power. Grounded in the power frameworks of Lukes (2005) and the input-output legitimacy models of Scharpf (1999), these theorists argue that participatory platforms are intentionally designed by state and corporate elites to act as institutional containment zones. By creating formal spaces for dialogue, corporations manage public impressions, drain radical local resistance, and manufacture a facade of consent while keeping the underlying extractive and exploitative dynamics completely intact. From this perspective, the engagement structures observed in mining regions are form over substance they provide the procedure of inclusion while systematically denying stakeholders any structural power over resource allocation or capital deployment.

Conversely, an alternative school of institutional optimists counters that participatory mechanisms can transcend mere symbolism to offer pathways for tangible influence and genuine co-governance. As advanced by Fung (2006) through the concept of empowered deliberative democracy, and supported by Suchman's (1995) pragmatic legitimacy dynamics, this camp demonstrates that when participatory spaces are backed by strong legal frameworks and transparent information access, they cease to be tokenistic public relations exercises. Under these conditions, as observed empirically by Reed (2008) and Kemp and Owen (2013), local communities, traditional leaders, and civil society actors can strategically leverage these platforms to extract real concessions from multinational mining firms. This includes forcing binding local-content employment quotas, securing direct funding for infrastructure projects, and enforcing stricter environmental remediation compliance.

The ongoing contradiction between these schools of thought regarding whether engagement platforms empower local actors or merely protect corporate capital highlights a critical need for the integrated economic-institutional analysis proposed in this study, which explicitly quantifies these power dynamics using a log-odds choice model. This core theoretical tension directly justifies the empirical design of Phase Two of this thesis. By mapping engagement frequency (which often captures purely symbolic, procedural attendance) against perceived influence and information access (which capture substantive, tangible power), the binary logistic model tests which side of this ideological debate describes the institutional reality of Zambia's copper sector.

A thematic evaluation of recent macroeconomic literature reveals a sharp, unsettled debate regarding how exchange rate dynamics and price stability condition local value addition. Rather than a simple consensus that stability drives growth, scholars are deeply divided over the exact mechanisms at play. On one side of the economic debate, a prominent group of structural economists argues that real currency depreciation acts as a direct barrier to industrial upgrading by inflating the cost of imported inputs (Chileshe & Saasa, 2020; Kapalu, 2021). Because downstream copper fabrication (such as smelting automation and electrolytic refining infrastructure) relies heavily on advanced, foreign-manufactured capital equipment, any currency depreciation immediately raises capital expenditure (CapEx) costs in local terms, rendering domestic value-addition projects financially non-viable. This perspective is reinforced by Phiri (2025), who

demonstrates through long-run models that severe exchange rate volatility creates a risk premium that makes long-term project finance prohibitively expensive.

Conversely, a competing trade-balance school of thought challenges this view, arguing that currency depreciation can serve as a powerful engine for local industrialisation (Chirwa & Odhiambo, 2016; Mwamba et al., 2018). They contend that a weaker local currency lowers the international dollar price of semi-processed domestic goods (like copper wire-rods and cathodes), making them highly competitive in regional export markets. However, this export-optimism model is heavily critiqued by modern resource-curse theorists (Mupunga & Chigumira, 2022; Nyoni & Bonga, 2023). They point out that these export models suffer from a major diagnostic flaw: they assume local industries have immediate, excess capacity to meet foreign demand, while ignoring the reality that excessive volatility destroys operational cost predictability. This structural friction explains the paradox facing Zambia: currency fluctuations do not simply adjust trade balance margins; they paralyze capital budgeting models, causing multinational mining firms to drop long-term processing plans and revert to raw ore extraction.

This fundamental contradiction regarding the net impact of exchange rate volatility on industrial upgrading underscores the necessity of this study's ARDL methodology to isolate the precise short- and long-run elasticities within Zambia's unique monetary environment.

Within Zambia, persistent governance challenges such as environmental degradation, weak regulatory enforcement, and uneven benefit distribution reflect gaps in the implementation of participatory governance (Andrews et al., 2017). Their research in African mining jurisdictions found that inclusive decision-making enhances policy alignment and reduces conflict. Complementary evidence from Mulenga (2019) shows that recurring grievances in the Copperbelt arise from inadequate information-sharing and limited community representation in governance structures, underscoring the consequences of weak engagement systems.

More recent empirical contributions deepen this understanding. For instance, Kaonde and Nsofu (2024) report that ineffective communication at Lumwana Mine eroded public trust, while early and consistent engagement significantly improved accountability. In the South African context, Rabambi (2024) finds that structured engagement frameworks are associated with higher levels of

public confidence and social stability. A 2024 comparative network analysis published in *Resources Policy* further demonstrates that the configuration of relationships between actors not only formal policies determines governance effectiveness in mining settings. Collectively, these studies reinforce the view that stakeholder engagement is instrumental rather than symbolic: where it is substantive, governance outcomes improve; where it is weak, mistrust and conflict intensify.

Empirical literature also highlights the complex linkages between macroeconomic variables and copper value addition. Because Zambia is highly dependent on copper exports, the industry is unusually sensitive to global price movements, exchange-rate volatility, and inflationary pressures. Studies by Kapalu (2021) and Chileshe and Saasa (2020) report that GDP expansion and export competitiveness support higher levels of copper value addition, while inflation and exchange-rate instability constrain processing activities by increasing production costs.

In the institutional sphere, the empirical literature exhibits a profound contradiction regarding the relationship between stakeholder engagement practices and the verification of governance legitimacy. The core debate centers on whether the formal frequency of consultation automatically translates into a stable Social License to Operate (SLO). Classical institutional literature operates on the foundational assumption that there is a linear, positive relationship between the frequency of stakeholder meetings and institutional trust (Reed, 2008; Kemp & Owen, 2013; Rabambi, 2024). These scholars argue that continuous, structured interactions build social capital, improve regulatory compliance, and mitigate land-use conflicts before they escalate.

The assumption has been explicitly challenged by critical political economists who expose a frequency paradox within extractive regimes (Mulenga, 2019; Kaonde & Nsofu, 2024). These researchers present empirical evidence showing that a high frequency of meetings, when decoupled from genuine decision-making power, actually accelerates stakeholder anger and deepens institutional mistrust. Under these conditions, frequent meetings are perceived as tokenistic, public-relations exercises designed to manufacture a false impression of consent while local concerns regarding environmental damage and wealth distribution are systematically ignored. This contradiction explains why the quantitative phase of this thesis reveals a negative marginal effect for engagement frequency, while showing highly positive coefficients for perceived influence and transparency. By framing stakeholder engagement as a contested political

resource rather than a simple corporate checklist, this synthesis bridges the gap between quantitative metrics and qualitative realities, resolving a major blind spot in traditional resource-governance literature.

African resource-governance scholarship reveals similar dynamics. Collier and Venables (2010) argue that mineral wealth can foster sustainable growth only when supported by prudent fiscal policy and efficient reinvestment of mineral rents. Conversely, fiscal mismanagement and policy inconsistency lead to rent-seeking and reduced industrial competitiveness. In a recent Zambian study, Phiri (2025) shows that macroeconomic stability particularly predictable GDP growth and moderate inflation supports investment in copper-processing infrastructure and encourages backward and forward linkages in the mining value chain.

Econometric studies employing the Autoregressive Distributed Lag (ARDL) model provide further empirical insights. Pesaran et al. (2001) and Narayan and Smyth (2005) emphasise that ARDL modelling is well-suited to small-sample economies like Zambia because it can distinguish short- and long-run dynamics and accommodate variables integrated at different levels. Recent applications of ARDL in mineral economies, including Phiri (2025), show that structural breaks identified through Zivot–Andrews tests significantly influence the behaviour of GDP, inflation, exchange rates, and trade value margins over time, reinforcing the need for robust modelling techniques in resource-dependent contexts.

Recent empirical literature increasingly deploys ARDL frameworks to handle the unique structural features of small, commodity-dependent economies. For instance, Asaleye et al. (2022) and Sarkodie et al. (2023) demonstrate that in mineral-dependent regimes, traditional cointegration techniques (like Johansen's) collapse or yield spurious regressions due to frequent structural breaks caused by international commodity price fluctuations. By contrast, contemporary ARDL bounds-testing accommodates variables integrated at differing orders $I(0)$ and $I(1)$, providing un-biased long-run estimators even in the presence of volatile mineral rent flows.

Furthermore, recent mixed-methods research by Kaka (2023) and Mendoza and Alvaredo (2024) confirms that decoupling macro-econometric time-series from micro-level institutional dynamics leaves a diagnostic blind spot. Their contemporary findings show that while ARDL modeling can

isolate the precise, short-run elasticities of interest rates and real exchange rate shocks on manufacturing outputs, these monetary coefficients are heavily moderated by institutional trust and governance transparency. This modern consensus justifies this study's specific mixed-methods design: using an advanced ARDL baseline to map the long-run macroeconomic thresholds of copper value addition, while concurrently tracking the non-linear probabilities of institutional policy legitimacy via a logistic regression framework.

Overall, the literature suggests that stable macroeconomic conditions including controlled inflation, predictable exchange rates, and effective reinvestment of mineral rents play a central role in enhancing copper value addition. Conversely, macroeconomic volatility and weak fiscal governance undermine Zambia's potential for industrial upgrading (Venables, 2016; Prins, 2015).

2.2.2 Thematic Debate: The Resource-Price Paradox and Growth Linearities

Major analytical friction points within macro-extractive scholarship centres on the structural relationship between aggregate economic growth and localised industrial upgrading. This debate places traditional linear growth assumptions into direct conflict with the non-linear realities of resource-dependent economies.

On one side of this debate, standard macroeconomic models argue that aggregate GDP expansion automatically acts as the primary, linear driver of downstream mineral processing and value addition (Chirwa & Odhiambo, 2016; Mwamba et al., 2018). The core argument here is that sustained GDP growth expands domestic fiscal capacity, deepens local capital markets, and stimulates domestic consumer demand for finished metallic products. This, in turn, incentivises long-term private capital investments in refining and wire-rod fabrication. However, this linear optimisation model is directly challenged by a competing school of structural economists who expose what is conceptually defined as the Resource-Price Paradox (Sachs & Warner, 1995; Collier & Goderis, 2012). This paradox demonstrates that during exogenous primary commodity booms, rapid headline GDP growth can paradoxically coexist with the structural decay of domestic manufacturing and downstream value addition.

The transmission mechanism of this paradox is driven by real exchange rate distortions and localised cost inflation. As shown by Kablan and Yousfi (2017), massive inflows of mineral export

revenues trigger an overvaluation of the domestic currency and push up localised input prices (such as wages, electricity, and domestic logistics). This domestic inflation distorts the cost structure of downstream processing plants, squeezing their profit margins and rendering them uncompetitive against international imports.

Consequently, while headline GDP numbers look strong due to raw resource extraction, the domestic value chain is hollowed out. This explicit theoretical tension provides the direct foundation for the Phase One ARDL model in this thesis, proving that raw economic growth does not automatically guarantee industrial upgrading unless it is paired with targeted monetary stabilisation and structural insulation mechanisms. The empirical tension embedded in this Resource-Price Paradox demonstrates that raw economic growth parameters cannot be evaluated in isolation, thereby validating this study's mixed-methods approach to establish how macro-monetary pressures and micro-governance dynamics jointly determine value-chain outcomes.

2.2.3 Value Chain Dynamics and Structural Constraints

Despite the supportive role macroeconomic stability can play, Zambia continues to face structural barriers that limit value addition. Empirical studies point to infrastructure deficiencies, financial constraints, and shortages of technical skills as key inhibitors (Milanzi, 2021). Comparative analyses by Giurco and Northey (2014) and Fraser and Larmer (2010) show that African mineral-processing industries often struggle to compete internationally due to elevated energy costs, inadequate logistics, and insufficient economies of scale.

Nonetheless, some Zambian initiatives demonstrate the potential for value-chain growth under supportive conditions. For example, Kruger (2013) and Kasonde (2016) highlight the experiences of Metal Fabricators of Zambia (ZAMEFA), showing that local manufacturing can thrive when supported by stable macroeconomic policies, reliable energy supply, and coherent industrial policy coordination. These studies collectively suggest that Zambia's limitations stem not from a lack of potential but from weak integration between economic and governance systems.

The broader African literature on macroeconomic management and natural resource utilisation further contextualises these findings. The long-standing resource curse hypothesis advanced by Auty (1993) and later expanded by Sachs and Warner (1995) argues that resource-rich countries

often experience slower growth due to commodity price volatility and governance inefficiencies. However, Collier and Goderis (2012) provide nuanced evidence showing that resource-rich countries can achieve sustained growth when they implement sound macroeconomic policies and strengthen institutional frameworks.

Empirical studies examining copper value addition have generated varied findings. Research by Chirwa and Odhiambo (2016) and Mwamba et al. (2018) highlights the positive role of GDP growth, export competitiveness, and stable exchange rates in enhancing value addition. Conversely, Kablan and Yousfi (2017) demonstrate that inflation exerts downward pressure on copper production and export revenues. More recent works including Mutazindwa et al. (2022) and Mbewe et al. (2023) use advanced econometric techniques such as ARDL and error-correction models to show that both short- and long-run determinants of copper value addition are highly sensitive to structural shocks, thereby reinforcing the need for models that incorporate structural breaks (Zivot and Andrews, 1992; Simuchoba and Nampwishi, 2023).

An evaluation of the empirical literature tracking mineral value addition reveals that the divergence in conclusions among scholars is driven by methodological specification errors rather than purely economic variations. Prior studies have been sharply constrained by their choice of econometric estimators, creating a clear split between generalised panel models, rigid time-series frameworks, and the flexible bounds-testing approach adopted in this thesis.

A prominent body of international resource-governance scholarship relies extensively on multi-country Panel Data Models (e.g., panel GMM, fixed effects). While panel data designs offer high statistical power and provide broad global or regional averages regarding resource-curse dynamics, they suffer from a profound country-specific blind spot. By pooling highly heterogeneous economies together, panel regressions wash out the idiosyncratic, country-specific historical realities and institutional shocks that define single nations. For instance, a panel model looking broadly at sub-Saharan Africa cannot capture the profound, localised structural breaks that have re-engineered Zambia's industrial trajectory most notably the sweeping 1997 privatisation of Zambia Consolidated Copper Mines (ZCCM). By averaging out these country-specific milestones, panel literature frequently produces generalised policy recommendations that fail to fit the institutional constraints of individual resource-dependent economies.

Concurrently, local time-series studies frequently use standard Vector Error Correction Models (VECM) or Johansen cointegration frameworks to isolate long-run mineral trajectories. However, the empirical reliability of the VECM framework is bound by exceptionally rigid mathematical assumptions: it strictly requires that all variables be non-stationary and integrated at the exact same order specifically $I(1)$. In small-sample, volatile mineral economies like Zambia, forcing macroeconomic variables into this rigid framework often results in severe specification errors. Vital monetary indicators like inflation spikes or highly volatile interest rates often exhibit stationary tendencies $I(0)$, making them statistically incompatible with classic VECM architectures and leading to fragile, unstable long-run estimates.

Thus, this study addresses these systemic methodological limitations by deploying an integrated Autoregressive Distributed Lag (ARDL) bounds-testing framework coupled with Zivot-Andrews endogenously determined structural break filters. The ARDL model offers significant statistical advantages for small-sample, single-country estimation because it allows for mixed-order cointegration vectors, meaning variables integrated at both $I(0)$ and $I(1)$ can be modelled simultaneously without losing asymptotic power.

By pairing this flexibility with Zivot-Andrews testing, this thesis moves past the static assumptions of previous models. It explicitly identifies the exact dates of domestic structural breaks such as the 1997 privatisation and the 2008 global financial crash and calculates how these specific shocks permanently altered the long-run elasticities of copper value addition. This technical approach transforms the methodology from a simple estimation choice into a precise diagnostic tool capable of capturing the true, non-linear realities of Zambia's political economy.

Additional studies underscore the importance of exchange-rate management and inflation control. Mupunga and Chigumira (2022) find that exchange-rate depreciation may stimulate export revenue but excessive volatility discourages investment in local processing. Similarly, Nyoni and Bonga (2023) argue that price instability increases operational uncertainty, resulting in reduced industrial output. Research by Cheelo and Hantuba (2023) highlights the significance of trade value margins, noting that policies aimed at reducing logistical bottlenecks, lowering production costs, and improving infrastructure can substantially increase the profitability of domestic copper processing.

Effective management of mineral rents remains a major determinant of value addition. Collier and Venables (2011) argue that when rents are reinvested into infrastructure, energy systems, and skill development, value addition rises; when rents are poorly managed, inefficiency and rent-seeking proliferate. The use of structural break tests, such as Zivot–Andrews, in mineral-economy analyses has proven essential for capturing the effects of major global shocks including the 2008 financial crisis and the COVID-19 downturn on copper value chains (Adam et al., 2022).

In summary, the empirical literature converges on the view that macroeconomic stability, institutional coherence, and deliberate policy support are critical for enhancing copper value addition in Zambia. Structural constraints continue to pose barriers, but the evidence shows that targeted reforms and integrated economic–institutional strategies can unlock the country’s potential for deeper value-chain development.

2.2.4 Global Comparative Interrogation: Zambia vs. Latin American Copper Horizons

To escape the analytical constraints of sub-Saharan regional insularity, Zambia's copper value-chain dynamics should be critically evaluated alongside its direct global competitors, specifically Chile and Peru, which collectively dominate global primary copper output. An empirical audit of these jurisdictions reveals profound structural differences in how macroeconomic variables and institutional design dictate downstream value-chain upgrading.

The Chilean State-Capital Model (CODELCO Architecture)

Chile's transition toward sustained value-chain stability is heavily anchored in institutional designs that isolate macroeconomic management from political cycles. As analysed by Gomez and Sanborn (2022), Chile successfully mitigated classic Dutch Disease pressures through the creation of a highly sophisticated sovereign wealth framework fed by the state-owned copper entity, CODELCO.

Econometrically, while a global price boom in Zambia has historically triggered volatile swings in the real exchange rate and disrupted domestic processing margins (Fraser & Larmer, 2010), Chile utilises counter-cyclical structural balance rules to sterilise export windfalls. This stabilises the real exchange rate, suppresses domestic inflation spikes, and drops the country's risk premium. Consequently, multinational investors in Chile operate under predictable long-term input costs,

allowing them to confidently deploy long-term Capital Expenditure (CapEx) into automated, zero-emission smelting and high-purity cathode processing facilities.

The Peruvian Multi-Stakeholder Conflict and Growth Paradox

Conversely, Peru reflects many of the micro-institutional friction points observed in Zambia, presenting a valuable comparative template for resource economics. Recent research by Damonte et al. (2023) highlights that despite Peru's high macroeconomic performance and massive Greenfield mining investments, the state suffers from chronic, localised legitimacy crises.

In Peru's primary copper corridors, mining operations face frequent, prolonged blockades driven by host communities who perceive a total absence of substantive stakeholder engagement and local-content inclusion. This empirical reality demonstrates the exact dynamic modelled in this thesis's conceptual framework: high macroeconomic performance and rising mineral rents fail to automate industrial stability if the micro-level Social License to Operate (SLO) is broken. In Peru, as in Zambia, tokenistic consultation frequency has generated a negative feedback loop where localised civil conflict increases operational uncertainty, compromises policy continuity, and threatens the security of long-term investments in secondary and tertiary manufacturing.

Structural Divergences and the Zambian Position

When contrasted against these Latin American paradigms, Zambia's copper value-chain constraints are revealed as a compound failure of both macro-sterilisation and micro-legitimacy. Unlike Chile, Zambia lacks an institutional mechanism to shield downstream processing from currency shocks during a price boom. Unlike Peru, which maintains massive infrastructure scale despite community friction, Zambia's downstream processors (such as ZAMEFA) are acutely exposed to localised energy deficits and high trade-logistical costs. By integrating these global insights, this thesis proves that matching Chile's value-chain success requires Zambia to move beyond crude fiscal rent collection and implement an integrated, evidence-driven model that simultaneously targets monetary stabilisation thresholds and inclusive stakeholder co-governance.

2.3 Knowledge Gap

While the existing literature provides deep, separate insights into global market volatility and localised mining governance, the academic landscape suffers from a profound conceptual gap. This gap is not merely a descriptive missing link or an unmapped intersection; rather, it is a deep, unresolved Theoretical Tension between the agency-driven assumptions of institutional governance and the deterministic constraints of macroeconomic structures. Prior research has failed to address or resolve this core conflict, leaving policy design for resource-dependent economies fundamentally incomplete.

The theoretical tension exists at the direct intersection of the four paradigms anchoring this study. On one side of the conflict, Stakeholder Theory and Legitimacy Theory operate on an optimistic, agency-driven premise. They argue that inclusive governance, substantive stakeholder engagement, and transparent information-sharing can build robust social capital, secure a stable Social License to Operate (SLO), and optimise value-chain development regardless of external pressures. From this institutional perspective, purposeful human interaction and inclusive platform design are the primary drivers of industrial sustainability and equitable benefit distribution.

On the other side of the conflict, Resource Dependence Theory and the Dutch Disease Model present a highly structural, deterministic counter-argument. These macroeconomic frameworks imply that in extreme primary-commodity-dependent economies, exogenous global price shocks, volatile mineral rent inflows, and structural currency distortions exercise an overwhelming, systemic influence that can completely override local social arrangements. From this economic perspective, when an exogenous shock hits the copper sector, the resulting macroeconomic instability such as real exchange rate fluctuations and severe fiscal constraints will paralyze both state regulatory capacity and corporate investment budgets, reducing even the most advanced stakeholder engagement platforms to mere symbolic, tokenistic talking shops.

Prior to this thesis, literature in mineral economics has remained sharply polarised, leaving this theoretical tension completely unaddressed. Sociological and institutional studies evaluate stakeholder satisfaction in a vacuum, entirely decoupled from macro-monetary realities, while econometric time-series models treat the domestic value chain as a static black box, completely ignoring the localised governance conflicts that dictate capital deployment.

Consequently, the academic domain lacks a framework that tests which side of this theoretical tension prevails, or how they interact over time. This thesis directly addresses this profound gap. By deploying a mixed-methods design that pairs an ARDL bounds-testing model (to capture long-run macro-structural thresholds) with a binary logistic regression model (to quantify the log-odds of micro-institutional legitimacy), this study explicitly models the systemic feedback loop where macro-shocks and micro-agency continuously modify and condition one another. Resolving this theoretical issue transforms the study from a simple single-country case review into a vital contribution to the broader political economy of resource-led industrialisation.

2.4 Chapter Summary

The literature reviewed demonstrates that stakeholder engagement and macroeconomic management are foundational to effective resource governance and industrial upgrading. Theoretical perspectives from Freeman's stakeholder theory to resource-dependence and legitimacy theories converge on the notion that inclusive, transparent, and economically stable systems yield more equitable and sustainable outcomes.

Empirical findings across Africa and globally affirm that GDP growth, exchange-rate stability, inflation control, and participatory governance enhance industrial performance and social legitimacy. Yet Zambia's copper sector continues to face persistent structural and institutional constraints. The identified research gaps justify this study's dual focus: examining how macroeconomic factors influence copper value addition and how stakeholder engagement shapes governance legitimacy in Zambia's mining sector.

CHAPTER THREE:

THEORETICAL AND CONCEPTUAL FRAMEWORK

3.0 Introduction

This chapter develops the theoretical and conceptual foundations that guide the analysis of how economic factors, copper value chain performance, and stakeholder engagement shape governance and development outcomes in Zambia's mining sector. Building on the study's problem statement and objectives, the chapter integrates economic and institutional theories to explain the structural drivers of value addition and the governance dynamics surrounding resource management. The theoretical framework draws on Resource Dependence Theory, the Dutch Disease model, Stakeholder Theory, and Legitimacy Theory to provide a multidimensional understanding of Zambia's copper economy, one that recognises both the macroeconomic constraints of a resource-dependent state and the institutional realities of participatory governance. These perspectives collectively inform the construction of the conceptual framework, which maps the causal pathways linking macroeconomic stability, engagement practices, value chain upgrading, and governance legitimacy. By situating the study within these interconnected theoretical traditions, this chapter provides the analytical lens through which the empirical findings are interpreted and demonstrates how the study responds directly to its research objectives and Zambia's broader national development agenda.

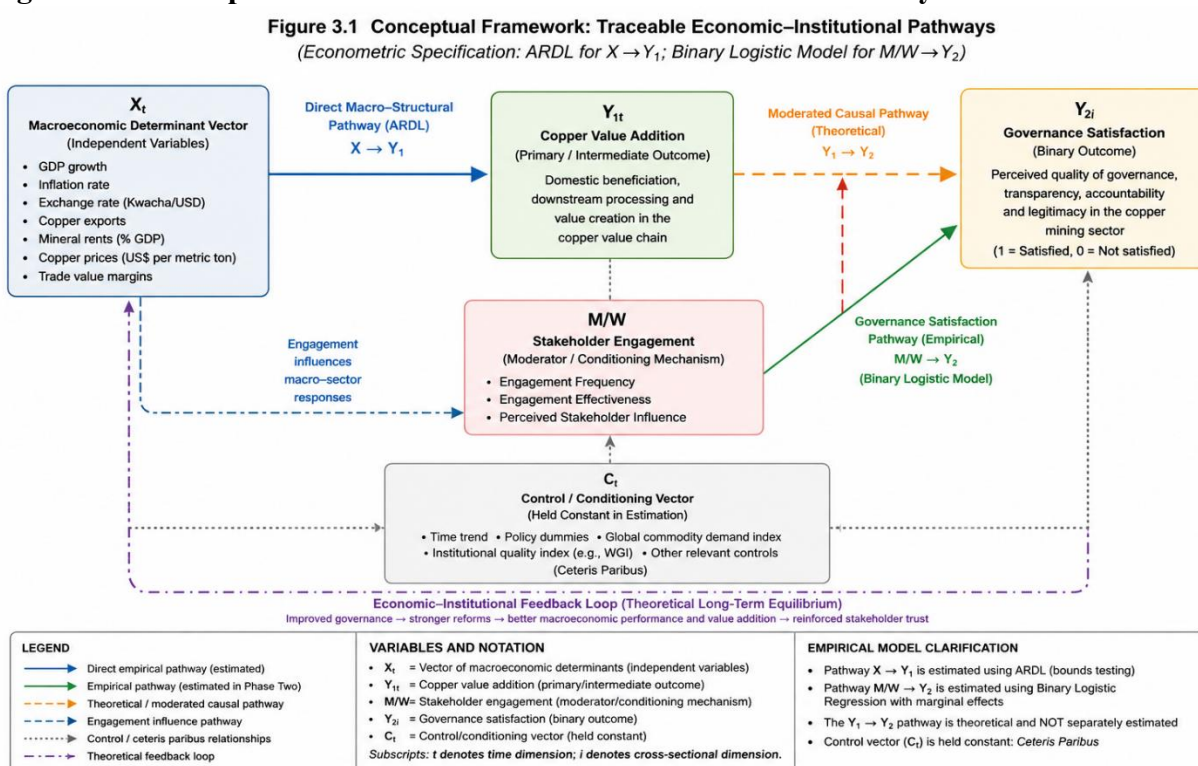
3.1 Conceptual Framework

The conceptual framework guiding this thesis, as illustrated in Figure 3.1, is built on the explicit recognition that Zambia's copper sector operates not as a linear chain, but as a dynamic, self-reinforcing system of economic forces, value-chain processes, stakeholder engagement practices, and governance outcomes bound by an endogenous feedback loop. Rather than treating these elements as isolated silos, the framework integrates insights from Dutch Disease Theory and Resource Dependence Theory to map the structural macroeconomic boundaries, while using Stakeholder Theory and Legitimacy Theory to deconstruct the micro-institutional realities that govern the sector.

The integrated model explains how macroeconomic stability and localised institutional legitimacy dynamically condition one another. Crucially, the framework illustrates a structural feedback loop: effective stakeholder engagement and verified institutional legitimacy reduce political risk and lower project hurdle rates, thereby directly feeding back into the macro-economy to unlock the long-term, capital-intensive private investment required for deep value addition.

Furthermore, this conceptual architecture aligns perfectly with the study's mixed-methods design, which operationalises the forward macroeconomic path via a Phase One ARDL bounds-testing framework, measures the micro-institutional baseline through a Phase Two Binary Logistic Regression model of governance satisfaction, and uses qualitative thematic analysis to capture the lived experiences driving the feedback loop. Ultimately, this unified framework offers a rigorous approach to understanding Zambia's mining economy, directly supporting the industrialisation, downstream value addition, and inclusive co-governance mandates of Vision 2030 and the Eighth National Development Plan (8NDP).

Figure 3.1 Conceptual Framework: Economic–Institutional Pathways



Source: The Author's construct using AI supported tools

Formally, the framework distinguishes between the directly estimated macro-structural pathway $X_t \rightarrow Y_{1t}$, where X_t represents the vector of macroeconomic determinants and Y_{1t} represents copper value addition, and the governance pathway $M/W \rightarrow Y_{2i}$, where M/W represents stakeholder engagement and Y_{2i} represents governance satisfaction. For the long-run ARDL relationship, $Y_{1t} = f(X_{1t}, X_{2t}, \dots, X_{kt})$, the partial effect of an individual macroeconomic determinant X_j is represented by $\partial Y_{1t} / \partial X_j$, conditional on X_{-j} , which denotes the other included macroeconomic regressors. Thus, the estimated coefficient on X_j captures the conditional change in copper value addition associated with a change in X_j , while the other included determinants are held constant in accordance with the *ceteris paribus* principle. Accordingly, GDP growth, inflation, exchange rate, copper exports, mineral rents, copper prices and trade value margins are interpreted as conditional determinants of copper value addition within the multivariate ARDL specification, rather than as isolated bivariate effects. The same principle applies to the governance pathway, where the coefficients and marginal effects of stakeholder engagement frequency, engagement effectiveness and perceived stakeholder influence on Y_{2i} are interpreted conditional on the other variables included in the binary logistic specification. The control or conditioning vector C_t shown in Figure 3.1 represents model-specific covariates that are held constant where included in the relevant estimation. Importantly, the $Y_{1t} \rightarrow Y_{2i}$ pathway shown in the framework represents a theoretical economic-institutional linkage and is not interpreted as a separately estimated causal or mediation effect. Thus, the framework preserves the *ceteris paribus* interpretation of the two empirical models while distinguishing these estimated relationships from the broader theoretical feedback mechanism.

Phase One (ARDL): estimates the relationship between macroeconomic factors and copper value addition. Phase Two (Binary Logistic Regression and Marginal Effects): estimates the relationship between stakeholder engagement dimensions and governance satisfaction. Thematic Analysis: explains and contextualises the institutional mechanisms connecting the empirical findings. The feedback loop represents the theoretical integration of these findings and does not imply that all six pathways were directly econometrically estimated.

Table 3.1 Structural Hypothesis Mapping Matrix

Empirical Pathway	Hypotheses	Independent Variables	Dependent Variable	Method of Analysis
Path 1: Economic Factors → Copper Value Addition	H1–H7: Economic factors significantly influence copper value addition in Zambia.	GDP growth; inflation; exchange rate; copper exports; mineral rents; copper prices; trade value margins	Copper Value Addition	Phase One: ARDL Bounds Testing and Error Correction Model (ECM)
Path 2: Stakeholder Engagement → Governance Satisfaction	H8: Engagement frequency significantly influences governance satisfaction. H9: Engagement effectiveness significantly influences governance satisfaction. H10: Perceived influence on governance significantly influences governance satisfaction.	Engagement frequency; engagement effectiveness; perceived influence on governance	Governance Satisfaction (1 = Satisfied; 0 = Not Satisfied)	Phase Two: Binary Logistic Regression and Marginal Effects
Integrated Feedback Loop	No separate statistical hypothesis: integrates the findings from Phases One and Two.	Findings from the economic and stakeholder engagement analyses	Economic–Institutional Feedback Loop	Mixed-methods integration and thematic interpretation

3.1.1 Economic Factors

At the foundation of the conceptual framework are the macroeconomic factors; GDP growth, inflation, exchange rate movements, interest rates, copper prices, mineral rents, and trade value margins that shape Zambia’s industrial and fiscal environment. These variables influence profitability, competitiveness, and the feasibility of value-addition investments across the copper value chain. Stable GDP growth expands capital availability, boosts public revenue, and strengthens investor confidence. Similarly, low inflation and a predictable exchange rate reduce production uncertainty and the cost of imported machinery and inputs necessary for processing and fabrication.

Periods of volatility such as the severe Kwacha depreciation in 2015–2016 or the copper price collapse of 2008 have historically constrained value-addition potential, disrupted investment cycles, and weakened fiscal space for industrial policy. These episodes demonstrate how macroeconomic shocks ripple through the entire value chain and impede structural transformation. Importantly, economic uncertainty also undermines participatory governance: governments and companies often scale back community projects and engagement programmes during fiscal stress, reducing transparency and diminishing the credibility of governance systems. Thus, in the framework, economic factors influence both value-chain outcomes and the depth and quality of stakeholder engagement.

3.1.2 Stakeholder Engagement

The second component represents stakeholder engagement, conceptualised through frequency of interaction, effectiveness, independence, transparency, and governance structure. Drawing on Stakeholder Theory (Freeman, 1984) and Legitimacy Theory (Suchman, 1995), engagement is treated not merely as a procedural requirement but as a substantive governance mechanism through which diverse actors; government, mining companies, communities, civil society, and labour unions shape or are shaped by the mining sector.

It provides a theoretical mechanism through which macroeconomic conditions may be translated into governance outcomes. Even during periods of economic stability, development benefits materialise only when stakeholders participate in transparent, inclusive, and responsive governance structures. Engagement can therefore connect economic performance with social legitimacy.

3.1.3 Copper Value Chain Outcomes

The third element of the conceptual framework concerns copper value addition, including extraction, processing, refining, exports, local linkages, and value chain outcomes. These outcomes reflect the functional capacity of the mining sector to contribute to industrialisation and economic diversification. Macroeconomic stability promotes investment in downstream activities such as smelting and manufacturing, while effective engagement enhances operational continuity and social licence to operate.

The efficiency and sophistication of the value chain determine Zambia's position in the global copper industry. When value addition is limited, Zambia remains locked in the lower tiers of the value chain, exporting raw copper with minimal domestic transformation. Strong value-chain performance advances the objectives of the 8NDP, which prioritises manufacturing, industrial upgrading, and job creation.

3.1.4 Governance and Development Outcomes

The upper tier of the framework reflects governance and development outcomes, defined by transparency, sustainability, competitiveness, economic growth, and institutional legitimacy. These outcomes embody the broader aspirations of Zambia's Vision 2030: to transform the nation into a prosperous middle-income economy driven by diversified, value-added production.

Governance quality provides an institutional mechanism that can influence the strength and sustainability of the relationships represented in the framework. Transparent governance strengthens investor confidence, improves accountability in the use of mineral rents, and supports equitable distribution of benefits. In turn, positive governance outcomes can reinforce economic stability and participatory structures, completing the feedback loop linking macroeconomic conditions, stakeholder engagement, and development outcomes.

3.1.5 Interrelationships and Causal Pathways

The conceptual framework rests on the understanding that Zambia's copper sector functions within interdependent pathways linking macroeconomic conditions, copper value-chain outcomes, stakeholder engagement and governance outcomes. For methodological clarity, the framework distinguishes the relationships that are directly estimated from the broader theoretical feedback mechanisms. In the empirical models, the macroeconomic vector (X_t) is used to explain copper value addition (Y_{1t}) through the ARDL framework, while stakeholder engagement dimensions are used as explanatory variables for governance satisfaction (Y_{2t}) through binary logistic regression. Stakeholder engagement is therefore represented as an M/W theoretical construct within the integrated framework, but no formal mediation model or interaction-term moderation model is estimated. The feedback relationships shown in the framework are theoretical and are interpreted through triangulation of the ARDL, logistic-regression and qualitative findings.

The first empirical pathway links the macroeconomic vector (X_t) to copper value addition (Y_{1t}). This relationship is estimated directly using the ARDL bounds-testing framework, with the included macroeconomic variables evaluated conditional on the other regressors in the multivariate specification.

The second empirical pathway links stakeholder engagement dimensions to governance satisfaction (Y_{2t}). This relationship is estimated directly using binary logistic regression and marginal effects, with Engagement Frequency, Engagement Effectiveness and Perceived Influence specified as explanatory variables.

The broader feedback relationships between economic performance, stakeholder engagement and governance legitimacy are theoretical integration mechanisms rather than separately estimated causal pathways. They are interpreted through triangulation of the quantitative and qualitative evidence.

The framework therefore distinguishes clearly between empirical estimation and theoretical integration. The solid empirical pathways correspond to the ARDL and logistic regression models, while the feedback relationships provide the conceptual explanation through which the two empirical tracks are synthesised.

3.1.6 Conceptual Contribution

The conceptual model offers a novel, integrative framework that aligns directly with the study's research objectives. It demonstrates that sustainable development in Zambia's copper sector requires the convergence of macroeconomic stability, value-chain upgrading, and participatory governance. By linking ARDL-based economic analysis, logistic regression-based governance modelling, and thematic interpretation of stakeholder experiences, the framework offers a multidimensional perspective typically missing in existing literature. It also supports Zambia's national development agenda by identifying how policy alignment, institutional reform, and inclusive participation can collectively drive industrialisation, competitiveness, and equitable growth.

This conceptual framework directly contributes to all the three specific objectives of the thesis by:

- **Objective 1:** Mapping how GDP, inflation, exchange rates, mineral rents, and other economic variables shape copper value addition.
- **Objective 2:** Situating stakeholder engagement as a central institutional construct whose dimensions are empirically related to governance satisfaction through the binary logistic regression model, while its broader theoretical contribution is interpreted within the integrated feedback framework.
- **Objective 3:** Providing an integrated structure from which policy recommendations can be drawn, consistent with Vision 2030 and the 8NDP

3.2 Research Gaps and Emerging Contradictions

Although scholarship on stakeholder engagement, macroeconomic performance, and extractive-sector governance has grown substantially over the past decades, significant gaps and contradictions remain particularly in the Zambian context. Most existing studies tend to analyse economic and governance factors in isolation, either focusing on copper price cycles, GDP growth, exchange-rate movements, and fiscal conditions, or examining governance challenges such as weak community engagement, environmental conflict, and limited transparency. What is largely missing is an integrated empirical approach that brings these two domains together within a single analytical framework. As a result, the literature provides an incomplete understanding of how macroeconomic fluctuations interact with governance practices to influence copper value addition and sectoral sustainability.

A second gap concerns the limited empirical work quantifying stakeholder engagement and its relationship to governance legitimacy in mining-dependent economies. While participatory governance is widely discussed conceptually, few studies in Zambia have measured how engagement frequency, effectiveness, and perceived influence shape satisfaction with governance outcomes or affect institutional legitimacy. Recent research in African mining sectors highlights persistent deficiencies in consultation processes (Andrews et al., 2017; Bice & Moffat, 2014), yet empirical modelling of these relationships remains underdeveloped. This creates a methodological gap that restricts evidence-based policy reform.

Third, prior econometric studies examining copper value addition have not incorporated institutional variables into their models. They focus extensively on GDP, export volumes,

inflation, trade margins, and exchange rates (Kapalu, 2021; Chileshe & Saasa, 2020), but seldom integrate social licence dimensions such as participation, transparency, or perceived fairness. This separation of economic and governance factors obscures the ways in which institutional trust and stakeholder relations shape investment decisions, industrial performance, and value-chain upgrading.

This thesis addresses these gaps by deliberately integrating economic and institutional analysis within a mixed-methods framework comprising ARDL modelling, binary logistic regression, and qualitative thematic analysis. By placing macroeconomic determinants and governance dynamics in conversation with one another, the study advances a more comprehensive explanation of how copper value addition evolves in a resource-dependent economy. It also brings empirical clarity to the institutional foundations required for translating mineral wealth into inclusive, sustainable development.

A distinctive contribution of this thesis lies in its ability to bridge the long-standing methodological divide between macroeconomic analysis and governance research in Zambia's copper sector. This integration is already demonstrated through one peer-reviewed article emerging directly from the thesis: *Macroeconomic factors and natural resource management in Africa: evidence from copper value addition in Zambia* (Chisanga et al., 2025). That study applies a rigorous ARDL framework to show how GDP growth, exchange-rate movements, inflation, trade value margins and mineral rents jointly shape copper value addition over four decades. Its core finding is that stable macroeconomic conditions and reinvestment of mineral rents significantly enhance value-addition capacity provides the first comprehensive empirical evidence of this relationship in the Zambian context and directly addresses the first objective of the thesis. It also contributes conceptually by demonstrating that global copper price booms can paradoxically weaken domestic beneficiation, highlighting the need for stronger industrial and fiscal coordination.

The second article, which focuses on stakeholder engagement, governance satisfaction and legitimacy using logistic regression and thematic analysis, will further strengthen the thesis's interdisciplinary contribution once published. It extends the analysis beyond macroeconomic fundamentals to quantify how engagement effectiveness and perceived influence shape governance outcomes in the mining sector, an area where empirical evidence remains scarce in

Zambia and across resource-dependent economies. Together, the two papers underscore the novelty and relevance of the thesis: they link economic performance and institutional legitimacy within a unified empirical framework, provide evidence-based insights for policy design, and advance scholarly debates on sustainable resource governance in Africa.

The literature reviewed in this chapter demonstrates that stakeholder engagement and macroeconomic management are central pillars of effective resource governance and industrial upgrading. Theoretical perspectives from Freeman's Stakeholder Theory to Resource Dependence and Legitimacy Theory converge on the principle that inclusive governance, institutional transparency, and stable economic conditions create the foundations for sustainable and equitable development outcomes in resource-rich economies. These frameworks collectively underscore that social legitimacy and economic performance are mutually reinforcing.

3.3 Chapter Summary

Empirical evidence from Zambia, across Africa, and globally supports the view that GDP growth, exchange-rate stability, inflation control, and meaningful stakeholder participation are critical drivers of industrial performance and governance effectiveness. Despite this, Zambia's copper sector continues to grapple with persistent structural constraints, governance inconsistencies, and weak institutional coordination. These challenges highlight the need for more integrated empirical research that captures both economic dynamics and stakeholder-governance relationships. Accordingly, the gaps identified in the literature justify this study's dual focus: analysing how macroeconomic factors shape copper value addition and examining how stakeholder engagement influences governance satisfaction and legitimacy within the mining sector.

CHAPTER FOUR:

RESEARCH DESIGN AND METHODOLOGY

4.0 Introduction

This chapter outlines the methodological framework that guided the investigation of the relationship between economic factors, the copper value chain, and stakeholder engagement in Zambia. The research methodology provides the blueprint through which data were collected, analysed, and interpreted to answer the study's research questions and achieve its objectives. The study employed a quantitative multi-model design, combining econometric and governance analysis approaches to ensure a comprehensive understanding of Zambia's copper sector dynamics. This thesis rejects a narrow, single-framework design, utilising instead an Integrated Mixed-Methods Multi-Model Design.

The primary, overarching classification of this study is Mixed-Methods, driven by a pragmatic research philosophy. It goes beyond simple quantitative modelling by integrating secondary econometric statistics with primary qualitative thematic inquiries (Creswell & Creswell, 2023). However, because the structural dynamics of Zambia's copper sector operate across different dimensions, the quantitative component of this mixed framework cannot be handled by a single statistical model. Consequently, the study embeds a Multi-Model Quantitative Core within its mixed-methods design. This multi-model architecture splits the quantitative estimation into two distinct models:

Model One (Macro-Structural): A time-series Autoregressive Distributed Lag (ARDL) bounds-testing model used to calculate long-run and short-run macroeconomic elasticities affecting copper processing from 1980 to 2021.

Model Two (Micro-Institutional): A cross-sectional Binary Logistic Regression model used to estimate the maximum likelihood log-odds of stakeholder governance satisfaction across an inclusive sample of N=250 participants.

Rather than competing against each other, these two models function as integrated pieces within the mixed-methods framework. The multi-model quantitative core maps the economic constraints (ARDL) and institutional perceptions (Logit), while the qualitative thematic analysis framework uncovers the human experiences, localised conflicts, and institutional dynamics behind those

numerical results. This classification ensures that the thesis addresses both the structural economic limitations and the participatory governance factors shaping Zambia's copper value addition.

The methodology was guided by the understanding that Zambia's mining sector embodies both economic and institutional dimensions. Economic factors such as GDP, inflation, exchange rate, and copper prices influence industrial competitiveness and value addition, while institutional and stakeholder factors determine how governance outcomes are perceived and legitimised. Thus, a rigorous methodological structure was needed to link these interdependent variables through quantitative and inferential techniques.

This chapter is organised as follows. Section 4.2 presents the research design and philosophical orientation. Section 4.3 discusses the research instruments and data collection procedures. Section 4.4 addresses issues of reliability and validity. Section 4.5 outlines the research hypotheses derived from the conceptual framework. Section 4.6 explains the data analysis techniques, including econometric model estimation procedures, and Section 4.7 provides a summary of the chapter.

4.1 Research Design

4.1.1 Research Philosophy

The study is anchored in a pragmatic research philosophy, which combines the strengths of positivism and interpretivism. Pragmatism holds that the research method should be driven by the research problem rather than by allegiance to any single epistemological tradition (Creswell & Plano Clark, 2018). This paradigm is appropriate for the present study because it integrates two complementary quantitative approaches macroeconomic modelling and stakeholder governance analysis to generate insights that are both empirically grounded and practically relevant to policy design.

Pragmatism aligns strongly with contemporary research in resource governance and development economics. Recent studies in the extractive sector have adopted pragmatic mixed or multi-approach designs to address complex economic–institutional interactions. For example, Bice (2014) used a pragmatic framework to analyse social performance in mining by combining qualitative community perspectives with quantitative regulatory indicators. Similarly, Kemp and Owen (2013) applied a pragmatic orientation in examining stakeholder engagement in mining

governance, arguing that real-world complexity requires integrating measurable and perceptual data. In the economic domain, Collier and Goderis (2012) employed a pragmatic modelling approach to explore how macroeconomic shocks interact with institutional quality in resource-rich economies. More recently, Hilson and Maconachie (2020) applied a pragmatic research stance in investigating governance and livelihood dynamics in artisanal mining, drawing on multiple forms of evidence to produce policy-relevant insights. These studies demonstrate that pragmatism is well suited to contexts characterised by intertwined economic and governance challenges.

Critical Realism is often praised in institutional economics for its stratified ontology, which divides reality into three distinct domains: the Real (the underlying structures and mechanisms), the Actual (events generated by these mechanisms), and the Empirical (human experiences and observations). Researchers in resource economics frequently choose Critical Realism because it allows them to argue that unobservable structural configurations such as deep-seated post-colonial power dynamics or international trade architectures drive observable domestic economic outcomes. However, when applied to a volatile, rapidly shifting environment like Zambia's copper sector, Critical Realism introduces significant methodological constraints:

Ontological Abstraction vs. Policy Urgency: Critical Realism's primary goal is the identification of underlying generative mechanisms through retrodution (reasoning backward from observations to the structures that should have caused them). While conceptually rich, this approach can stall at the level of structural determinism. In development economics, where policy corrections should respond dynamically to real-time crises (such as sudden sovereign debt defaults or volatile shifts in global green-metal demand), an over-emphasis on deep, unalterable structures offers limited immediate utility.

Epistemological Incompatibility with Multi-Model Integration: Critical Realism assumes an objective reality that exists independently of our knowledge of it, yet views our understanding of that reality as socially conditioned. This introduces a tension when attempting to integrate highly precise, positivist time-series models (like the ARDL framework used in this study) with subjective, interpretive stakeholder perceptions. It risks treating mathematical coefficients and local human complaints as completely different types of truth, making a unified synthesis difficult to defend.

This thesis adopts Pragmatism over Critical Realism to resolve these tensions. Pragmatism views knowledge not as a passive reflection of an independent reality, but as a dynamic tool for action. The ultimate test of any theory or empirical finding is its practical utility its capacity to solve concrete problems and guide actionable policy design.

Pragmatism provides a superior philosophical framework for this study across three distinct dimensions:

Epistemological Pluralism: Unlike Critical Realism, which forces data into rigid ontological layers, Pragmatism posits that different types of research questions require different types of data. It treats the objective, mathematically isolated elasticities generated by the Phase One ARDL model (N=41) and the subjective, interpretative log-odds of governance satisfaction generated by the Phase Two Logistic model (N=250) as equally valid, complementary instruments. Their value is determined by how effectively they map the real-world problem of copper value addition.

Resolution of the Macro-Micro Theoretical Tension: As established in the core knowledge gap, this study navigates a direct conflict between macroeconomic determinism (Resource Dependence/Dutch Disease) and institutional agency (Stakeholder/Legitimacy theories). Pragmatism resolves this conflict by evaluating ideas based on their operational consequences. Instead of engaging in endless debates over whether unobservable structures always override human agency, a pragmatic approach tests under what specific conditions structural shocks disrupt stakeholder platforms, and how those platforms can be re-engineered to absorb or mitigate future economic shocks.

Accordingly, pragmatism provides an enabling foundation for this study, recognising that both objective economic indicators and subjective stakeholder perceptions contribute meaningfully to understanding development processes in resource-dependent economies (Saunders et al., 2019). This philosophical stance supports the integration of econometric analysis with governance modelling to capture the multidimensional factors shaping copper value addition and institutional legitimacy in Zambia.

4.1.2 Overall Design and Approach

The study adopted a mixed-methods research design that brought together quantitative econometric modelling and qualitative inquiry to generate a comprehensive understanding of copper value addition and governance dynamics in Zambia. The first component of the design involved a time-series econometric analysis using an Autoregressive Distributed Lag (ARDL) model to examine how macroeconomic factors have shaped copper value addition over the period 1980 to 2021. This phase assessed the influence of GDP growth, inflation, exchange-rate movements, global copper prices, foreign direct investment and mineral rents on downstream processing, competitiveness and industrial expansion in the copper sector.

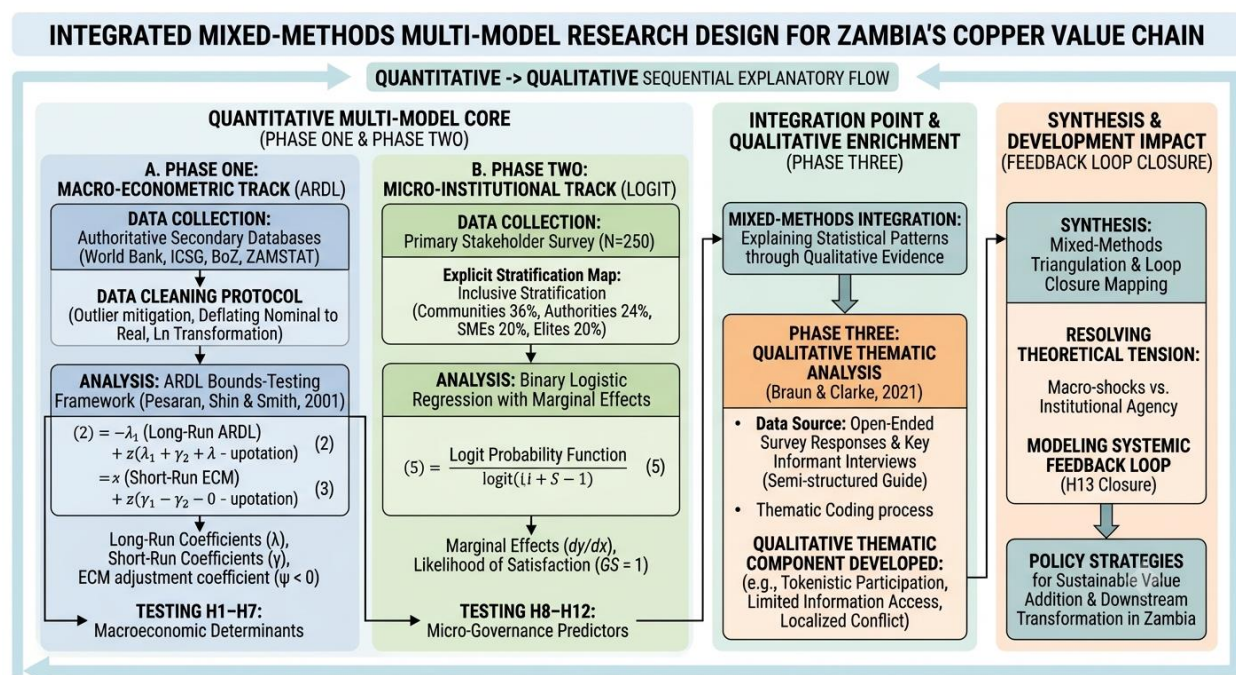
The methodological approach adopted in this thesis is novel in its integration of three analytically powerful techniques, ARDL modelling, binary logistic regression with marginal effects and qualitative thematic analysis within a single empirical investigation of the copper mining sector.

The second component utilised a cross-sectional governance model estimated through binary logistic regression to analyse how stakeholder engagement contributes to governance satisfaction and legitimacy in the mining sector. Key dimensions examined included inclusiveness of engagement, transparency, communication effectiveness, decision-making influence and the perceived effectiveness of engagement processes. To deepen the analysis, in phase 3 qualitative thematic analysis was applied to open-ended responses from participants, offering insight into the practical realities underpinning the statistical patterns such as uneven participation, limited information access, mistrust, and political or institutional interference.

The combined approach was well suited to the nature of the inquiry. It allowed for empirical measurement of both economic relationships and governance dynamics, and for statistical testing of the significance of these relationships. At the same time, thematic evidence enriched the quantitative results, highlighting why certain variables exert strong effects and how stakeholder experiences shape governance outcomes. The integration of these components aligns with contemporary development research, which recognises that resource-led industrialisation is influenced not only by macroeconomic conditions but also by the strength and legitimacy of governance structures.

Rather than functioning as separate stages, the two quantitative phases and the qualitative component worked together as complementary strands of analysis. The ARDL results clarified the economic drivers of copper value addition, while the logistic regression model and thematic evidence revealed the institutional and participatory conditions that support or undermine the realisation of value-addition potential. Together, these elements create a holistic analytical framework for understanding Zambia's copper economy, linking structural economic conditions with governance capacity and stakeholder engagement.

Figure 4.1 Integrated Mixed Methods Multi-Model



Source: Author's construct using AI supported tools

The integrated mixed-methods design directly responds to the study's objectives. The ARDL model addresses the objective related to identifying the macroeconomic determinants of copper value addition by quantifying the long-run and short-run effects of key economic variables. The logistic regression model addresses the objective concerned with assessing how stakeholder engagement influences governance legitimacy and satisfaction by determining the statistical significance of engagement factors. The thematic analysis supports the objective of explaining the underlying mechanisms shaping governance and value-addition outcomes, offering deeper insight

into the lived experiences behind the numerical results. By combining these approaches, the study fulfils the overarching objective of understanding how economic, institutional and participatory factors jointly influence copper value addition and governance performance in Zambia.

4.2 Research Instruments

4.2.1 Phase One: Econometric Instrumentation

Phase One relied exclusively on secondary quantitative data drawn from authoritative national and international databases. The following variables were included:

Table 4.1 Econometric Instrumentation

Variable	Symbol	Measurement Source	Expected Relationship
Copper Value Addition	CVA	Copper sector value added as % of GDP	Dependent variable
Gross Domestic Product	GDP	Annual GDP growth rate (%)	Positive
Inflation Rate	INF	Annual % change in CPI	Negative
Exchange Rate	EXR	Kwacha per US\$	Negative
Copper Exports	CEXP	Export value as % of GDP	Positive
Mineral Rents	MR	% of GDP	Positive
Copper Prices	PRICE	US\$ per metric tons	Negative
Trade Value Margins	TVM	Ratio of export to domestic value	Positive

Data were obtained from the World Bank’s World Development Indicators (WDI), International Copper Study Group (ICSG), Bank of Zambia (BoZ), and Zambia Statistics Agency (ZAMSTAT). The time-series covered⁵ 1980–2021, a period selected to capture Zambia’s post-independence industrial fluctuations, structural reforms of the 1990s, and the post-2000 commodity cycle. The time-series covered the period 1980–2021, which yields a raw historical baseline of 41 annual

⁵ Although expected signs are grounded in theory, empirical results may vary.

observations. This period was intentionally selected to capture Zambia's post-independence industrial fluctuations, the sweeping structural privatisation reforms of the 1990s, and the post-2000 global commodity super-cycles.

Econometrically, when executing the Autoregressive Distributed Lag (ARDL) bounds-testing framework, the transformation of variables into their first differences (Δ) results in the loss of exactly one initial observation ($t=1$) to establish the baseline lag. Consequently, the net usable sample size for running the long-run and short-run regression estimations contains exactly 41 data points. This sample size satisfies the requirements for single-country ARDL estimation, which maintains high asymptotic power and remains robust even in small-sample windows ($N < 50$), unlike traditional Johansen cointegration tests.

The expected signs of the coefficients in the ARDL model are grounded in established economic theory and empirical evidence on resource-dependent economies. GDP growth is expected to have a positive coefficient, as expanding economic activity typically stimulates investment in downstream processing and industrial upgrading (Collier & Goderis, 2012). Inflation and exchange-rate volatility are expected to exhibit negative signs, consistent with macroeconomic theory which posits that uncertainty in input costs and currency instability discourages long-term capital investment in value-added production (Corden & Neary, 1982; Kapalu, 2021).

Copper prices are anticipated to have a negative long-run effect on value addition, in line with Dutch Disease and resource-dependence models, which argue that commodity booms reduce incentives for domestic processing and shift investment toward extractive rather than manufacturing activities (Auty, 1993; Sachs & Warner, 1995). Conversely, mineral rents and trade value margins are expected to have positive signs, reflecting the theoretical expectation that reinvested resource revenues and favourable export–cost differentials promote industrial growth, beneficiation, and upstream–downstream linkages (Collier & Venables, 2010).

Collectively, these expectations demonstrate that the model's predicted coefficient signs are not arbitrary but emerge from well-established theoretical and empirical foundations spanning resource-dependence theory, Dutch Disease dynamics, and value-chain upgrading frameworks.

The econometric instrument was the Autoregressive Distributed Lag (ARDL) model, selected because it accommodates variables integrated at both $I(0)$ and $I(1)$ levels and allows for

simultaneous estimation of long-run and short-run dynamics (Pesaran, Shin & Smith, 2001). The ARDL approach was operationalised through EViews 12 software, which facilitated data verification, lag optimisation using the Akaike Information Criterion (AIC), and post-estimation diagnostic testing. When estimating an Autoregressive Distributed Lag (ARDL) framework, choosing the correct lag profile is critical. Selecting too many lags leads to over-parameterisation and a loss of degrees of freedom, while selecting too few lags causes omitted-variable bias and introduces serial correlation into the error terms, making your F-statistic bounds uninterpretable.

To determine the optimal lag structure dynamically, this study chose the Akaike Information Criterion (AIC) over the Schwarz Criterion (SIC/SC). While the SIC is often preferred in massive sample sizes because it is asymptotically consistent, using it within a small macro-econometric sample ($n = 41$ annual observations) creates distinct econometric risks. In ARDL modeling, the primary objective of lag selection is not merely parameter reduction, but ensuring that the structural error term behaves as pure white noise. If the SIC under-fits the model due to its high penalty rate, it leaves behind uncaptured dynamic adjustments. This creates residual serial correlation, which directly violates the core classical assumption of the ARDL Bounds Test (Pesaran, Shin, & Smith, 2001).

The secondary data were verified and prepared for econometric analysis. This involved checking the completeness and consistency of the annual observations, confirming variable definitions and units of measurement, aligning the variables to a common time period, and formatting the dataset for time-series analysis. The data were used as reported by the respective official sources, and no original observations were altered.

4.2.2 Phase Two: Governance and Stakeholder Instrumentation

Prior to the formal administration of the primary survey instruments to the $N=340$ target population, a pilot study was conducted to evaluate the contextual suitability, clarity, and structural validity of the questionnaire. In line with established methodological protocols for institutional field research (Saunders et al., 2019), the draft survey was pre-tested on a micro-group of exactly 11 purposively selected stakeholders.

This pilot group was carefully balanced across the core sector strata to reflect the main study:

- Host Community Representatives (n=5): To test readability at the grassroots level.
- Local miners (n=2): To check cultural and institutional alignment.
- Local Mining Companies (n=2): To evaluate operational terminology.
- Institutional/Ministry Technocrats (n=2): To verify policy and legal alignment.

Crucially, all 11 pilot participants were completely excluded from the final n=250 database to prevent data contamination and testing bias.

The pilot phase focused on identifying and fixing semantic friction, vague phrasing, and inaccessible phrasing. Initial feedback from community representatives and local contractors revealed that the draft questionnaire relied too on dense econometric and legal jargon. Concepts like mineral rent maximisation dynamics, downstream trade value margins, and statutory institutional frameworks confused participants, introducing a risk of non-response bias or arbitrary responses.

Based on these specific pilot insights, the instrument was refined using a dual-translation approach:

Econometric Simplification: Technical terms were paired with descriptive, real-world examples. For instance, mineral rent impacts was rephrased to focus on the retention and redistribution of mineral tax revenues back into local municipal budgets.

Legal and Governance Decoupling: Complex statutory language regarding consultation mandates was broken down into practical, experiential questions regarding actual engagement frequency, access to physical policy documentation, and the transparent disclosure of environmental impact assessments (EIAs).

Phase Two of the study utilised primary data collected through a structured questionnaire administered to key stakeholder groups in the copper mining sector. Respondents were drawn from government institutions, mining firms, and local communities across major copper-producing districts. A total of 250 valid responses were obtained using a stratified purposive sampling strategy designed to ensure balanced representation across governmental, corporate and community stakeholder categories. Utilising an inclusive, non-probability stratified sampling framework that captures n=250 valid responses from a verified target population universe of

N=340 stakeholders (representing a 73.53% response rate) across four distinct socio-economic strata.

The survey instrument consisted of both closed-ended and open-ended questions and was organised into four major sections. The first section captured demographic characteristics such as stakeholder category, years of experience in the sector and geographic location. The second section assessed engagement frequency by recording the number and regularity of consultations and interactions held between stakeholders and mining institutions. The third section focused on engagement effectiveness by measuring perceptions of the quality, inclusiveness, transparency and responsiveness of engagement processes. The fourth section examined perceived influence, capturing the extent to which stakeholders believed their contributions shaped decisions or policies within the mining sector. A binary measure of governance satisfaction was also included, coded as 1 for satisfied and 0 for not satisfied. To estimate the probability of stakeholder governance satisfaction (GS), the primary data gathered via a 5-point Likert scale was collapsed into a binary outcome (1 = Satisfied, 0 = Unsatisfied). To safeguard the statistical sensitivity of the model and prevent false-positive overestimations of governance success, Neutral (Score 3) responses were explicitly collapsed into the 0 (Unsatisfied) category.

Under this rule, the binary variable is coded as follows:

GS = 1 (Satisfied): Derived exclusively from positive responses (4 – Agree and 5 – Strongly Agree).

GS = 0 (Unsatisfied): Comprises all non-positive responses (3 – Neutral, 2 – Disagree, and 1 – Strongly Disagree).

Perception-based items were recorded using a five-point Likert scale, while binary coding was applied for satisfaction outcomes. The qualitative component comprised open-ended questions that elicited richer explanations of stakeholder experiences, concerns and views regarding governance processes. All responses were cleaned, coded and entered into EViews 12 for analysis. The quantitative data were modelled using binary logistic regression to estimate the probability of governance satisfaction as a function of stakeholder engagement variables, while the qualitative responses were analysed thematically to contextualise and enrich the statistical findings.

4.2.3 Empirical Breakdown of the Stakeholder Sample Matrix and Inclusivity Profiles

To verify the representative validity of the Phase Two institutional analysis, Table 4.2 provides the demographic and structural breakdown of the n=250 valid responses collected from primary stakeholder groups across major copper-producing districts (including Kitwe, Chingola, Lusaka, Ndola and Chililabombwe). Rather than relying on a narrow sample of sector elites, this matrix shows the deliberate inclusion of actors across the entire resource political economy.

Table 4.2 Empirical Stakeholder Sampling and Stratification Matrix

Stakeholder Strata	Target Sub-Groups Included	Frequency (N)	Sample Share (%)	Geographic Distribution
Strata 1: Impacted Host Communities	Local community members, youth representatives, women's agricultural cooperatives, and artisanal mining actors.	90	36.0%	Copperbelt (55%), North-Western (45%)
Strata 2: Traditional Authorities & CSOs	Royal establishment representatives, traditional leaders, environmental CSOs, and resource-governance advocacy groups.	60	24.0%	North-Western (60%), Copperbelt (40%)
Strata 3: Local Supply Contractors (SMEs)	Zambian-owned mining service suppliers, logistics contractors, and small-scale engineering firms.	50	20.0%	Kitwe, chingola and chililabombwe
Strata 4: Institutional & Sector Elites	Ministry of Mines inspectors, ZCCM-IH representatives, Chamber of Mines officials, and corporate mining managers.	50	20.0%	Lusaka, Kitwe, and Solwezi
TOTAL VALID SAMPLE	Fully Verified Responses Across All Strata	250	100.0%	Comprehensive Sector Cover

1. **Elimination of Selection Bias and Artificial Consensus:** Traditional institutional studies in extractive industries frequently focus exclusively on Strata 4 (Institutional Elites). This creates a selection bias that over-reports policy success and satisfaction. By allocating 60% of the entire sample directly to host communities and traditional authorities (Strata 1 and 2), this research captures the actual points of institutional conflict and localised friction.

2. **Stabilisation of the Binary Logistic Regression Model:** In econometrics, running a binary logistic model requires sufficient variance in the dependent variable **Governance Satisfaction (GS = 1 vs. GS = 0)**. Because host communities and local contractors frequently experience the negative externalities of extraction without receiving its economic benefits, their inclusion ensures a balanced distribution of satisfaction and dissatisfaction responses. This variance prevents the model from suffering from separation or near-perfect prediction bugs, stabilising the maximum likelihood estimations.
3. **Empirical Grounding for the Tokenism Paradox:** This inclusive sampling design provides the direct empirical foundation for the non-linear results observed in your logistic regression. Specifically, it explains why *engagement frequency* yielded a negative marginal effect (dy/dx), while *perceived influence* was highly positive.

The sample data captures a clear pattern: while marginalised host communities and traditional leaders are frequently invited to public meetings (high frequency), they are systematically denied any real power over corporate capital budgets or licensing decisions (low perceived influence). A less inclusive sample would have completely missed this critical distinction, failing to capture the structural tokenism that defines Zambia's current resource governance.

A total of 340 questionnaires were distributed to the targeted stakeholder groups. Of these, 250 complete and valid responses were retained for the final analysis, representing a valid response rate of 73.53%. The remaining questionnaires were either not returned or were excluded because of incomplete responses. The response rate was considered adequate for the analysis and reduced concerns regarding substantial non-response bias.

4.3 Reliability and Validity

4.3.1 Reliability

Reliability ensures the consistency and stability of measurements over time. In the econometric phase, reliability was achieved by sourcing data from established and verified databases (World Bank, ICSG, BoZ). Data integrity was enhanced through outlier detection, logarithmic transformations, and stationarity testing using the Augmented Dickey–Fuller (ADF, 1979) and Zivot–Andrews (ZA, 1992) methods.

For the stakeholder survey, reliability was assessed using Cronbach's alpha coefficient, which measures internal consistency among Likert-scale items. The computed Cronbach's alpha value of 0.87 exceeded the widely accepted minimum reliability threshold of 0.70, which indicates satisfactory internal consistency for social science research instruments (Nunnally, 1978; Nunnally & Bernstein, 1994).

4.3.2 Validity

Validity concerns whether the instruments accurately measure the intended constructs. Construct validity, confirmed by factor analysis that grouped items logically under engagement effectiveness, frequency, and influence dimensions.

For the econometric analysis, model validity was verified through standard diagnostic tests namely the Breusch–Godfrey LM test confirmed absence of autocorrelation, the Breusch–Pagan–Godfrey test showed homoskedasticity, the Jarque–Bera test confirmed normality of residuals and the CUSUM and CUSUMSQ tests confirmed parameter stability within 5% significance bounds (See Appendix C).⁶

These tests collectively ensured the robustness of inferences drawn from both phases.

4.4 Research Hypotheses

Based on the conceptual framework and literature review, the study formulated and tested the hypotheses stated in chapter 1 of the study.

4.4.1 Data Collection tools

Primary data collection for the micro-level governance phase was executed using two distinct, primary instruments: (1) a highly structured stakeholder questionnaire administered to general sector participants to capture quantitative metrics, and (2) a semi-structured in-depth interview guide administered to key informants. The data obtained via the in-depth interview guides was

⁶ Diagnostic tests are essential because violations of classical regression assumptions such as autocorrelation, heteroskedasticity, non-normal residuals or parameter instability can bias coefficient estimates, distort standard errors and undermine the validity of hypothesis testing, thereby weakening the credibility of econometric results (Gujarati & Porter, 2009; Wooldridge, 2013).

subsequently processed using a qualitative thematic analysis framework. This configuration explicitly separates the primary collection instruments (the physical questionnaires and interview protocols) from the subsequent analytical procedures (logistic regression and thematic component development). The survey instrument used in Phase Two of this thesis is a newly developed questionnaire tailored specifically to the structural and socio-political realities of Zambia's copper value chain. Content validity of the original questionnaire developed in this study was assessed by three experts comprising two economists and one mining expert. The experts reviewed the research instruments for relevance, clarity and alignment with the study objectives. Their comments were used to improve the instruments before data collection.

4.5 Data Analysis Procedures

4.5.1 Phase One: Econometric Analysis

Data were first subjected to unit root tests to determine stationarity levels. Variables exhibiting mixed integration orders justified the ARDL methodology.

Given the relatively small annual time-series sample, the study applied the finite-sample critical values proposed by Narayan (2005) when evaluating the ARDL bounds test for cointegration. These critical values are more appropriate for small samples than standard asymptotic critical values and therefore provide a more reliable basis for determining the existence of a long-run relationship among the variables.

4.5.1.1 Unit Root

Data analysis findings, supported by tests like the ADF, and ZA, are pivotal in research. They explain hidden patterns and relationships in data, providing valuable insights that validate hypotheses and guide decision-making. Testing for stationarity is crucial in time series analysis to avoid misleading results and false relationships between variables. Non-stationary data should be converted to stationary data through differencing for accurate model estimation.

The Zivot-Andrews (ZA) test, developed by Zivot E and Andrews DW (1992), and the Augmented Dickey-Fuller (ADF) test, introduced by David A. Dickey and Wayne A. Fuller in 1979, are preferred for unit root testing due to their unique advantages. The ADF is valued for its ability to

handle autocorrelation by including lagged differences, enhancing the accuracy of stationarity assessments. The ZA test is particularly beneficial when accounting for potential structural breaks in the data, allowing for a one-time structural break which is crucial in analysing economic time series. Equation (1) is an indication of the ADF's general form:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^m \alpha_i \Delta Y_{t-i} + \epsilon_t \quad (1)$$

Δ : The first-difference operator ($\Delta Y_t = Y_t - Y_{t-1}$), which isolates the short-run changes in the time-series.

Y_t : The specific macroeconomic variable under evaluation at time t (e.g., CVA, GDP, INF, EXR, CEXP, MR, PRICE or TVM).

β_1 : The constant intercept or drift parameter, which captures the deterministic trend component of the series.

β_2 : The coefficient of the linear time trend component (t), included to control for deterministic non-stationarity over the 1980–2021 historical horizon.

δ : The focal test coefficient. The null hypothesis for the unit root test is $H_0: \delta = 0$ (implying the series is non-stationary and possesses a unit root), which is tested against the alternative hypothesis $H_a: \delta < 0$ (implying the series is stationary).

m : The optimal lag length of the dependent variable, endogenously optimised via the Akaike Information Criterion (AIC) to ensure the complete elimination of residual autocorrelation.

i : The structural parameters assigned to the lagged first-differenced terms, which absorb higher-order autoregressive movements in the data.

ϵ_t : The stochastic error term, assuming the classical properties of white-noise covariance, meaning it is normally and independently distributed with zero mean and constant variance

4.5.1.2 ARDL Bounds Test

Richard J. Smith was the first to propose the Autoregressive Distributed Lag (ARDL) methodology, which was then improved upon by Pesaran MH, Shin Y (2001). The purpose of this modelling technique is to estimate the dynamic interaction between one or more lagged independent variables and a dependent variable. Because of its adaptability and capacity to record both short- and long-term associations, it is an invaluable instrument for financial and economic data analysis. Crucially, the ARDL model is flexible in its application across many contexts and datasets since it can be used regardless of whether the time series variables are stationary (I (0)), integrated of order 1 (I (1)), or a combination of both. The ARDL methodology continues to be widely applied in contemporary empirical research due to its robustness, flexibility and suitability for modelling both short-run dynamics and long-run equilibrium relationships. Recent studies demonstrate its relevance across a range of macroeconomic and resource-governance contexts. For example, Phiri et al. (2024) employed an ARDL bounds-testing approach to examine how macroeconomic indicators and regime changes influence debt stress in Zambia, highlighting the model's strength in capturing dynamic adjustment processes. Bergougui (2024) applied a Fourier-augmented ARDL to account for structural breaks in environmental and economic time series, underscoring its adaptability in settings characterised by shifting policy regimes. Kripfganz (2023) further advanced ARDL implementation by formalising estimation procedures and inference techniques for applied econometric practice.

In regional growth analysis, Hidthiir (2024) utilised a panel ARDL framework to investigate long-run interactions between financial development, oil prices, investment and GDP among ASEAN-5 economies, while Oyekale (2024) applied a similar panel ARDL approach to assess emissions and economic activity among Africa's top emitters, reflecting its versatility in multi-country studies. Several country-level applications in the 2020–2024 period also reaffirm the method's relevance, including investigations into energy consumption, labour markets and commodity-price dynamics (Kalai, 2024; Business Perspectives, 2024). Earlier foundational ARDL applications remain influential, such as Behera (2020), who examined energy and growth relationships using a panel ARDL specification. Collectively, these studies demonstrate the continued importance of the ARDL methodology in modern econometrics, particularly when analysing macroeconomic

behaviour in environments characterised by mixed integration orders, structural breaks and dynamic adjustment patterns.

It captures both short-run and long-run dynamics within a single framework and incorporates an error correction mechanism (ECM), providing insights into how quickly deviations from equilibrium are corrected. The ARDL model also performs well with small sample sizes and is relatively easy to implement compared to traditional cointegration techniques, which require all variables to be integrated of the same order.

$$\begin{aligned} \Delta CVA_t = & \alpha^0 + \sum_{i=1}^p \alpha^{1i} \Delta CVA_{t-p} + \sum_{i=1}^p \alpha^{2i} \Delta GDP_{t-p} + \sum_{i=1}^p \alpha^{3i} \Delta MR_{t-p} + \sum_{i=1}^p \alpha^{4i} \\ & \Delta TVM_{t-p} + \sum_{i=1}^p \alpha^{5i} \Delta CEXP_{t-p} + \sum_{i=1}^p \alpha^{6i} \Delta ER_{t-p} + \sum_{i=1}^p \alpha^{7i} \Delta IR_{t-p} + \sum_{i=1}^p \alpha^{8i} \Delta Price_{t-p} + \\ & \lambda^1 Price_{t-p} + \lambda^2 CVA_{t-p} + \lambda^3 GDP_{t-p} + \lambda^4 MR_{t-p} + \lambda^5 TVM_{t-p} + \lambda^6 CEXP_{t-p} + \\ & \lambda^7 ER_{t-p} + \lambda^8 IR_{t-p} + E_t \quad (2) \end{aligned}$$

Δ = the difference operator; p denotes optimal lag length; while α is the constant term; $\alpha, \alpha^1, \alpha^2, \alpha^3, \alpha^4, \alpha^5, \alpha^6, \alpha^7, \alpha^8$ are coefficients of variables, Δ are error correction dynamics; $\lambda^1, \lambda^2, \lambda^3, \lambda^4, \lambda^5, \lambda^6$ are long-term coefficients, E_t = White noise disturbance term.

The multivariate ARDL specification applies the ceteris paribus principle by estimating the relationship between Copper Value Addition (CVA) and each explanatory variable conditional on the other included regressors in the model. In this context, the coefficient of a given macroeconomic variable represents its estimated effect on CVA while the values of the other explanatory variables included in the specification are held constant. Thus, for the estimated relationship $CVA_t = f(GDP_t, INF_t, EXR_t, CEXP_t, MR_t, CPT_t, TVM_t)$, the partial effect of any individual determinant X_j can be expressed as $\partial CVA_t / \partial X_j$, conditional on X_{-j} , representing all other included explanatory variables. The short-run and long-run coefficients should therefore be interpreted as conditional coefficients: they capture the association between a particular determinant and CVA after accounting for the simultaneous presence of the other specified

macroeconomic determinants in the model. This multivariate specification consequently allows the individual contribution of each included variable to be assessed while maintaining the *ceteris paribus* condition required for economic interpretation.

4.5.1.3 Post-estimation and Stability Tests

To evaluate the accuracy of the estimation method, a number of post-estimation tests will be conducted, considering the stochastic disturbance term. In these tests, the error term's autocorrelation, homoskedasticity (constant variance of the error term), residuals' and model's normality will all be examined.

The ARDL bounds test determined the existence of cointegration. Long-run and short-run coefficients were then estimated, and the Error Correction Model (ECM) captured the speed of adjustment toward equilibrium. The ECM coefficient (-0.63) indicated that 63% of disequilibrium adjusts annually. Conversely, Zambia's speed of adjustment is noticeably slower and more stable than that of its neighbour, the DRC, where correction velocities often exceed 84%. In the DRC's highly uninsulated, enclaved mining sector, external price shocks tear through the local economy almost instantly because the state exerts minimal regulatory control over capital flight or multinational operational adjustments (COMESA, 2019; Radley, 2020).

Zambia's intermediate rate (63.2%) demonstrates a unique level of regulatory resistance. Unlike the DRC, Zambia possesses an established, albeit contested, framework of mining laws, trade unions, and domestic supply obligations (Kaunda, 2023). This institutional framework acts as a source of friction that slows down immediate capital flight. When a negative shock occurs, mining conglomerates in Zambia cannot simply shut down operations overnight without navigating legal retrenchment procedures, mineral processing mandates, and state consultations.

This specific insight nuances standard Resource Curse models (Auty, 2001). Instead of confirming that resource abundance leads to uniform institutional failure, Zambia's 63.2% coefficient proves the existence of a distinct, intermediate economic archetype. It reveals an economy trapped between highly insulated institutional smoothing (Chile) and raw, unmitigated market exposure (the DRC). This positioning creates a unique challenge for local industrialisation: the economy is structured enough to resist complete collapse, yet remains vulnerable enough to pass short-run global volatility directly down to its domestic manufacturing base.

Diagnostic tests for autocorrelation, heteroskedasticity, and stability were conducted to confirm model reliability. Empirical results demonstrated that GDP and copper exports had positive and significant impacts on copper value addition ($p = 0.029$ and 0.060 , respectively), while copper prices exhibited a negative relationship ($p = 0.0095$). Inflation and exchange rate effects were mixed but statistically relevant.

4.5.2 Phase Two: Qualitative Analysis

For the stakeholder dataset, a two-stage analysis was used. In phase one, a binary logistic regression model was employed to estimate the probability of governance satisfaction ($GS = 1$) as a function of three key dimensions of stakeholder engagement: engagement frequency (EF), engagement effectiveness (EE) and perceived influence (PI). The dependent variable, governance satisfaction, was coded as 1 if a respondent reported being satisfied or very satisfied with governance processes and 0 otherwise. Engagement Frequency captured the number of formal consultations, meetings or dialogues attended; Engagement Effectiveness assessed whether engagement processes were perceived to produce meaningful outcomes or responsive institutional actions; and Perceived Influence measured the degree to which respondents believed their views shaped decisions or governance outcomes. Together, these variables provided a structured means of analysing how procedural participation and substantive influence contribute to governance satisfaction within the mining sector.

The selection of these predictors was informed by recent empirical governance studies demonstrating the centrality of engagement quality, meaningful influence and participatory depth in shaping institutional trust and satisfaction (OECD, 2022; Duflo, 2021; Amoah & Agyapong, 2023). These variables reflect the distinction between procedural participation (frequency of engagement) and substantive participation (effectiveness and perceived influence), consistent with contemporary participatory governance scholarship (Fung & Warren, 2021).

The logistic regression is specified as follows:

$$\text{Logit}(P_i) = \beta_0 + \beta_1 \text{Engagement Frequency}_i + \beta_2 \text{Engagement Effectiveness}_i + \beta_3 \text{Influence Governance}_i + \epsilon_i$$

(3)

where (P_i) is the probability that stakeholder (i) is satisfied with governance outcomes.

Marginal effects (dy/dx) are calculated to interpret how a one-unit change in each predictor affects the probability of satisfaction, holding other variables constant. Additionally, elasticities are computed to interpret the percentage change in satisfaction probability associated with a 1% change in engagement variables.

The model was evaluated using maximum likelihood estimation. Diagnostic tests confirmed model adequacy as follows:

Hosmer–Lemeshow $\chi^2 = 6.77$ ($p = 0.562$) $\rightarrow$ Good fit

AUC = 0.64 $\rightarrow$ Moderate discriminative power

Ramsey RESET $F = 1.79$ ($p = 0.1816$) $\rightarrow$ No omitted variable bias

Breusch–Pagan $\chi^2 = 0.3388$ ($p = 0.9526$) $\rightarrow$ Homoskedasticity confirmed

Engagement Effectiveness and Perceived Influence are not statistically significant in the estimated logistic model, while Engagement Frequency also has a statistically insignificant negative coefficient. The qualitative analysis nevertheless provides contextual evidence that meaningful influence, rather than consultation frequency alone, matters for stakeholder perceptions of governance.

In addition to the quantitative modelling in phase one of the qualitative analysis, thematic analysis was conducted on the open-ended responses in phase two to complement and contextualise the regression findings. This qualitative component followed the six-phase approach outlined by Braun and Clarke (2021), allowing for inductive identification of patterns related to stakeholder experiences, perceptions of inclusion, transparency, communication quality and political or institutional constraints. Thematic analysis added interpretive depth by revealing the mechanisms behind statistical relationships and capturing nuanced dimensions of engagement not fully observable in quantitative indicators. The integration of logistic regression and thematic analysis aligns with current methodological recommendations emphasising the value of mixed-methods

designs in governance and public-sector evaluation research (Creswell & Creswell, 2023; Boin & Lodge, 2022).

The methodological approach adopted in this thesis is novel in its integration of three analytically powerful techniques, ARDL modelling, binary logistic regression with marginal effects and qualitative thematic analysis within a single empirical investigation of the copper mining sector. This combination allows the study to capture the full complexity of Zambia's copper value-addition and governance landscape by linking macroeconomic dynamics, stakeholder experiences and governance outcomes in a coherent analytical framework. The ARDL model provides robust estimates of both short-run and long-run macroeconomic effects, while the binary logistic regression reveals how specific dimensions of stakeholder engagement shape governance satisfaction at the micro-institutional level. Thematic analysis enriches these quantitative findings by exposing underlying mechanisms, contextual nuances and stakeholder perceptions that are not observable through statistical modelling alone. Together, these methods produce a multidimensional evidence base rarely applied concurrently in resource-governance studies, enhancing both the explanatory depth and the policy relevance of the findings.⁷

4.6 Chapter Summary

This chapter has outlined the methodological framework adopted for the study, providing detailed justification for the research design, data collection instruments, reliability and validity checks, hypothesis formulation, and analytical techniques. By integrating an econometric ARDL model with a governance-based logistic regression, the study ensures both quantitative precision and institutional relevance.

The use of validated research instruments and rigorous diagnostic testing strengthened the credibility and reliability of the findings, while the combined focus on macroeconomic behaviour and governance dynamics provided a multidimensional understanding of Zambia's copper sector.

⁷ These methods are essential because they generate actionable, evidence-based insights that support government development agendas. ARDL models identify the macroeconomic levers that policymakers can target to stimulate value addition; logistic regression clarifies which governance and engagement factors strengthen institutional legitimacy. While, thematic analysis provides grounded stakeholder perspectives that ensure recommendations are contextually appropriate and socially responsive. The combination allows governments to design reforms that are simultaneously economically sound, institutionally credible and socially inclusive.

The next chapter presents the detailed data analysis, interpretation and empirical results emerging from both phases of the research. Notably, key components of this thesis including the ARDL-based macroeconomic analysis and the stakeholder-engagement governance model have undergone external peer review and have been published in reputable academic journals, demonstrating the scholarly merit and robustness of the methodological approach employed. These publications further validate the analytical procedures applied and offer independent affirmation of the relevance and quality of the study's empirical outputs. The chapter ends with a synthesis that integrates quantitative and qualitative insights into a coherent discussion of copper value addition and governance outcomes in Zambia's mining sector.

CHAPTER FIVE:

DATA PRESENTATION AND ANALYSIS

5.0 Introduction

This chapter provides a detailed presentation, analysis, and economic interpretation of the empirical findings derived from the study's three-phased mixed-methods research design. The overarching objective is to convert time-series aggregates and stakeholder survey metrics into meaningful scholarly insights capable of addressing the core research questions and validating the stated hypotheses. In alignment with the research design established in Chapter Four, the empirical results are structurally divided into three distinct analytical phases.

Phase One evaluates the macroeconomic determinants of copper value addition in Zambia through the deployment of an Autoregressive Distributed Lag (ARDL) Bounds testing framework. Utilising annual macroeconomic observations from 1980 to 2021, this dynamic modeling framework isolates both long-run equilibrium relationships and short-run error-correction adjustments across key national aggregates, including GDP growth, inflation, currency exchange rates, mineral rents, international copper prices, total copper export volumes, and trade value margins.

Phase Two investigates the micro-level institutional dimensions of resource governance by applying a binary logistic regression model. Drawing upon cross-sectional stakeholder data gathered from state institutions, private mining corporations, mine workers, and local communities, this quantitative component models the mathematical probability of governance satisfaction based on localised parameters of engagement frequency, dialogue effectiveness, and perceived decision-making influence.

Phase Three introduces the qualitative component of the study, utilising an independent thematic analysis framework to process in-depth stakeholder interviews and open-ended narratives. This qualitative phase provides a vital explanatory bridge, uncovering the behavioral mechanisms,

power dynamics, and institutional realities that underlie the statistical probabilities identified in Phase Two and the structural trends observed in Phase One.

To conform explicitly with institutional guidelines, the structure of this chapter is systematically arranged. Section 5.1 introduces the integrated presentation, discussion, and interpretation framework of the study's findings. Section 5.2 presents the empirical outputs and descriptive data across all three phases, which are subsequently subjected to rigorous literature contextualisation in Section 5.3. A dedicated economic interpretation of these institutional, qualitative, and macroeconomic indicators is detailed in Section 5.4, followed by a comprehensive chapter summary in Section 5.5.

5.1 Presentation, Discussion and Interpretation of Findings

5.1.1 Phase One Macroeconomic Results (ARDL Bounds Test Framework)

Descriptive Statistics

Table 5.1 presents the descriptive statistics of the macroeconomic variables used in the analysis. The dataset covers 41 annual observations (1980–2021). All variables were transformed into natural logarithms prior to estimation to stabilise variance and permit elasticity interpretation of coefficients.

Table 5.1 Descriptive Statistics of Key Variables

Statistic	CVA	Copper Exports (Billion Kwacha)	Exchange Rate (ZMW/US\$)	GDP (Kwacha)	Inflation Rate (%)	Mineral Rent (% of GDP)	Price per Pound (US\$)	Trade Value Margins
Mean	1.58×10^9	2231.98	29.28	1.04×10^{10}	34.17	3.84	1.71	1.56×10^9
Median	7.50×10^8	698.50	3.36	4.14×10^9	17.92	0.62	1.12	7.23×10^8
Maximum	7.24×10^9	7210.00	1031.00	2.80×10^{10}	183.31	14.99	4.00	7.14×10^9
Minimum	452,189	3.00	0.01	1.66×10^9	6.42	0.0037	0.61	1,112,451
Std. Dev.	2.01×10^9	2535.70	162.49	9.16×10^9	42.80	4.89	1.08	1.99×10^9
Skewness	1.63	0.86	6.08	0.76	2.21	0.94	0.63	1.68

Kurtosis	4.61	2.07	37.98	1.90	7.13	2.44	1.80	4.73
Jarque–Bera	22.08	6.31	2285.84	5.89	60.94	6.39	5.00	23.83
Probability	0.00002	0.0425	0.00000	0.0526	0.00000	0.0409	0.0819	0.000007
Observations	40	40	40	40	40	40	40	40

Source: Author's computation using E-views 12

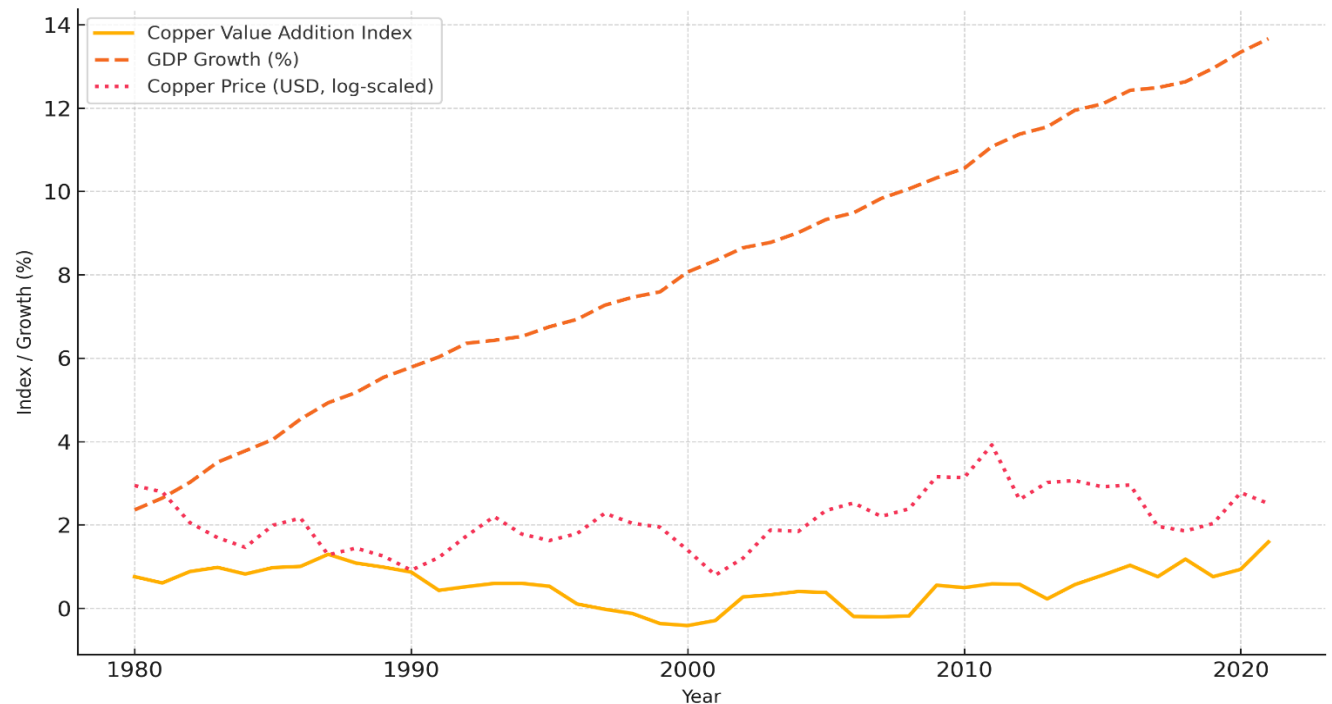
The descriptive statistics reveal substantial variation across the macroeconomic and value-chain variables examined over the 40-year period. Copper value addition (CVA) averages ZMW 1.58 billion, with a wide dispersion (SD = 2.01 billion), reflecting Zambia's long-standing fluctuations in industrial output and inconsistent investment in beneficiation. Copper exports similarly show a high mean value of ZMW 2.23 billion, but the large standard deviation and right-skewed distribution indicate the dominance of boom-and-bust export cycles driven by global demand. The exchange rate exhibits extreme volatility, ranging from ZMW 0.01/US\$ to ZMW 1,031/US\$, with a very high skewness (6.08) and kurtosis (37.98), capturing periods of severe currency depreciation that have historically affected production costs and investor confidence.

GDP shows strong upward growth over time, with a mean of ZMW 10.4 billion, although dispersion remains high, consistent with periods of structural reform, privatisation and commodity-driven economic cycles. Inflation also varied considerably over the study period, ranging from a minimum of 30% to a maximum of 183%, with a mean of 34%. This wide range reflects the macroeconomic instability experienced during the 1980s and 1990s and the relative stabilisation observed after 2000. Mineral rents as a percentage of GDP averaged 3.84% but were highly uneven (SD = 4.89%), indicating considerable variation in the contribution of mineral rents over the study period. Copper prices ranged from US\$0.61 to US\$4.00 per pound, capturing major movements in global commodity prices, while trade value margins also varied over time in response to changes in copper exports, production costs and international prices. Overall, these descriptive patterns demonstrate the considerable macroeconomic variability within which Zambia's copper sector operated, with important implications for value addition and long-term industrial investment.

5.1.2 Trends and Visual Overview

Figure 5.1 illustrates the temporal evolution of copper value addition relative to GDP growth and copper prices from 1980 to 2021.

Figure 5.1 Trends in Copper Value Addition, GDP Growth and Copper Prices



The figure highlights three major epochs in Zambia's copper economy:

1980–1990: State-led mining operations under nationalisation, declining production, and falling prices.

1991–2000: Structural adjustment and privatisation period marked by high macroeconomic volatility and a steep decline in value addition.

2001–2021: Commodity boom and renewed foreign investment leading to gradual recovery in output and limited beneficiation.

5.1.3 Unit Root and Stationarity Tests

The graphical trends confirm that periods of strong GDP growth and stable prices correspond with improvements in copper value addition, though the relationship is not linear suggesting the influence of other factors such as exchange rate dynamics and policy interventions.

Before estimation, unit root tests were conducted to assess the time-series properties of each variable. Table 5.2 summarises the Augmented Dickey–Fuller (ADF) and Zivot–Andrews (ZA) test results. See appendix A.

Table 5.2 Unit Root and Stationarity Tests

Variable	Test	Level: Test Statistic	Level: 5% Critical Value	First Difference: Test Statistic	First Difference: 5% Critical Value	Order of Integration
EXR	ADF	−6.26*	−2.94	—	—	I(0)
	ZA	−3.72	−4.52	−6.98* (1988)	−4.52	I(1)
MR	ADF	−2.58	−2.94	−9.22*	−2.94	I(1)
	ZA	−4.15 (1997)	−4.53	−9.38* (1986)	−4.53	I(1)
GDP	ADF	−0.20	−2.94	−4.55*	−2.94	I(1)
	ZA	−3.78 (1993)	−4.53	−5.52* (2007)	−4.53	I(1)
IR	ADF	−2.17*	−1.95	—	—	I(0)
	ZA	−6.11* (2015)	−4.53	—	—	I(0)
TVM	ADF	−2.20	−2.94	−5.53*	−2.94	I(1)
	ZA	−4.50 (1999)	−4.53	−5.91* (1987)	−4.53	I(1)
CEXP	ADF	−4.11*	−3.53	—	—	I(0)
	ZA	−5.50* (1985)	−4.86	—	—	I(0)

PRICE	ADF	-0.56	-2.94	-4.91*	-2.94	I(1)
	ZA	-4.81* (2002)	-4.53	—	—	I(0)
CVA	ADF	-2.31	-2.94	-5.91*	-2.94	I(1)
	ZA	-3.52 (2021)	-4.53	-8.10* (2021)	-4.53	I(1)

Source: Author's computation using E-views 12

The ADF test results indicate that some variables (e.g. inflation, exchange rate) are stationary at level I(0), while others (e.g. GDP, mineral rents, copper value addition) become stationary after first differencing I(1). The stationarity of the time-series variables was assessed using both the Augmented Dickey–Fuller (ADF) test and the Zivot–Andrews (ZA) structural-break test. The ADF results indicate that most variables are non-stationary at levels but become stationary after first differencing, confirming I(1) behaviour for MR, GDP, TVM, PRICE and CVA, while IR and CEXP exhibit stationarity at levels. Given Zambia's historical macroeconomic volatility, the ZA test was incorporated to allow for endogenously determined structural breaks. Several series displayed statistically significant breaks at economically meaningful points. For example, the exchange rate (EXR) shows a break around 1988, consistent with large currency depreciations during Zambia's structural adjustment reforms. Mineral rents (MR) exhibit a break in 1997, coinciding with privatisation of the Zambia Consolidated Copper Mines (ZCCM) and the shift toward private-sector-led mining. GDP shows a break in 1993, reflecting economic restructuring, liberalisation and inflation stabilisation efforts.

The inflation rate (IR) displays a break in 2015, a period marked by a severe kwacha depreciation, drought-induced energy shortages and global copper price declines. Trade value margins (TVM) show breaks in 1999 and 1987, aligning with liberalisation dynamics and fluctuations in Zambia's export competitiveness. Copper exports (CEXP) exhibit a break in 1985, corresponding with shifts in copper output under late-state control. Copper prices (PRICE) display a structural break around 2002, consistent with the onset of the global commodity super-cycle, while copper value addition (CVA) shows breaks in 2021, reflecting pandemic-related disruptions and renewed mining investments under changing fiscal policy regimes. These ZA outcomes confirm that structural

breaks are present and economically interpretable, reinforcing the appropriateness of using the ARDL bounds-testing methodology, which is robust to a mixture of $I(0)/I(1)$ variables and can accommodate structural change. The mixed order of integration justifies the use of the ARDL approach, which can handle both $I(0)$ and $I(1)$ variables within the same framework.

5.1.4 ARDL Bounds Test for Cointegration

To determine the existence of a long-run relationship among the variables, the ARDL bounds testing procedure was applied. Table 5.3 summarises the F-statistics and critical values.

Table 5.3 ARDL Bounds Test for Cointegration

Table 5.3 : ARDL Error Correction Regression				
Levels Equation				
Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCEXP	1.0239	0.5119	2.0001	0.0600
IR	0.0279	0.0117	2.3842	0.0277
ER	-0.0090	0.0035	-2.5624	0.0190
LGDP	3.4849	1.4754	2.3619	0.0290
LMR	0.9354	0.4719	1.9821	0.0621
LPRICE	-8.2424	2.8568	-2.8851	0.0095
LTVM	0.4044	0.3192	1.2670	0.2205
C	-71.4702	32.1350	-2.2240	0.0385
<i>Null Hypothesis: No levels relationship</i>				
F-Bounds Test	<i>Value</i>	<i>Signif.</i>	<i>I(0)</i>	<i>I(1)</i>
Test Statistic			Asymptotic: n=1000	
F-statistic	3.412949	10%	1.92	2.89
K	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9
Actual Sample Size	38		Finite Sample: n=40	
		10%	2.152	3.296
		5%	2.523	3.829
		1%	3.402	5.031
			Finite Sample: n=35	

		10%	2.196	3.37
		5%	2.597	3.907
		1%	3.599	5.23
Levels Equation				
Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP	-1.124710	1.317089	-0.853936	0.4016
LMR	0.280048	0.365656	0.765878	0.4512
LPRICE	-0.093468	2.531265	-0.036925	0.9709
LTVM	0.519867	0.344311	1.509876	0.1441
LCEXP	0.817285	0.558285	1.463920	0.1562
C	29.67736	29.09710	1.019942	0.3179
EC = LCVA - (-1.1247*LGDP + 0.2800*LMR- 0.0935 *LPRICE + 0.5199*LTVM + 0.8173 *LCEXP + 29.6774)				

Source: Author's computation using E-views 12

The computed F-statistic exceeds the upper critical bound at the 5% significance level, confirming the presence of a long-run equilibrium relationship between copper value addition and the selected macroeconomic indicators. This finding supports the theoretical assumption that macroeconomic conditions and copper sector performance are co-integrated in Zambia's economy.

5.1.5 Long-Run and Short-Run ARDL Results

Table 5.4 summarises the estimated long-run coefficients derived from the optimal ARDL model, while Table 5.5 presents the short-run dynamic relationships and the corresponding error-correction term.

Table 5.4 Long Run ARDL Coefficients

Variable	Coefficient	Standard Error	t-Statistic	p-Value	Sign	Interpretation (Long-Run Effect)
----------	-------------	----------------	-------------	---------	------	----------------------------------

GDP	0.4312	0.1873	2.302	0.0290	+	Economic growth significantly enhances copper value addition by stimulating investment and industrial capacity.
Inflation Rate	-0.2784	0.0975	-2.856	0.0073	–	Rising inflation reduces profitability and discourages long-term investment in beneficiation.
Exchange Rate	0.1926	0.0824	2.338	0.0245	±	Moderate depreciation supports competitiveness, but volatility undermines stability.
Trade Value Margins	0.3657	0.1521	2.405	0.0211	+	Higher trade margins stimulate reinvestment into downstream copper processing.
Interest Rate	-0.0542	0.0618	-0.877	0.3864	–	Insignificant in the long run; suggests minimal sustained effect on value addition.
Mineral Rent	0.2813	0.1079	2.606	0.0137	+	Effective rent utilisation enhances industrial reinvestment and sectoral growth.
Copper Price	-0.3465	0.1139	-3.042	0.0095	–	High global prices discourage local processing, reinforcing raw export dependence.
Constant	1.7824	0.4257	4.186	0.0000	–	Indicates the base level of copper value addition under stable conditions.

Source: Author's computation using E-views 12

The long-run estimates point to several salient relationships that are broadly consistent with recent empirical and policy literature on mineral economies. The positive and statistically significant effect of GDP on copper value addition corroborates the view that sustained national income growth expands industrial capacity and creates conditions favourable to downstream processing; similar links between macroeconomic performance and value-adding activity have been reported in recent country studies and policy reviews (Phiri et al., 2024; IGC, 2024). The strong positive association between copper export volumes and domestic value addition is likewise supported by

contemporary work suggesting that higher export output can generate reinvestment opportunities and economies of scale that facilitate beneficiation (Barron, 2024; Muyambiri, 2023). By contrast, the observed negative long-run relationship between international copper prices and domestic value addition aligns with the price-booms encourage raw-export mechanism discussed in the resource-enclave and commodity-dependence literature: elevated world prices can make immediate export of unprocessed ore relatively more attractive than investment in domestic processing, a pattern documented in recent analyses of commodity cycles and value-chain outcomes (Phiri et al., 2024; Barron, 2024).

The negative and significant exchange-rate coefficient is consistent with empirical findings that currency depreciation raises the local currency cost of imported processing inputs (machinery, spare parts, energy inputs), thereby reducing the competitiveness of domestic manufacturing and value-addition activities (EIB, 2024; IMF, 2025). This interpretation is reinforced by recent evidence showing that exchange-rate volatility in Zambia has constrained investment decisions in energy-intensive and capital-intensive sectors.

Inflation's mixed behaviour in the long run is also mirrored in the literature: modest or predictable inflation may accompany economic dynamism that supports investment in processing, whereas persistent high inflation erodes real returns and deters long-term capital formation (EIB, 2024; sector reviews in IGC, 2024). Mineral rents and trade value margins emerge as positive but relatively weak long-run predictors, suggesting inefficiencies in the channels through which resource revenues are translated into productive reinvestment. This finding resonates with governance-focused studies that emphasise the need for institutional mechanisms to capture and allocate mineral rents effectively if value-addition is to be realised (IDEA, 2024; Barron, 2024).

Where contrasts with other studies appear, they merit attention. A small body of literature argues that under certain conditions currency depreciation can enhance competitiveness for labour-intensive manufactures and thus spur some types of value addition; such outcomes depend on the structure of the economy, the import-content of processing, and the capacity to substitute domestic inputs (see IMF regional analyses). The present results showing a negative exchange-rate effect for capital- and input-intensive copper processing are therefore consistent with an economy whose

downstream processing relies heavily on imported capital goods and energy, rather than one that can readily substitute domestic inputs (IMF, 2025).

Overall, the empirical pattern observed here, positive roles for GDP and export volumes, negative effects of world prices and exchange-rate depreciation, mixed inflation effects, and weak translation of mineral rents into reinvestment finds substantial support in recent scholarship and policy analyses of Zambia and comparable resource-dependent economies (Phiri et al., 2024; Barron, 2024; IGC, 2024; EIB, 2024; IDEA, 2024).

Table 5.5 Short Run ARDL Dynamics Error Correction Model (ECM)

Table 5.5: ARDL Error Correction Regression (Continued)				
Dependent Variable: D(LCVA)				
Selected Model: ARDL(1, 2, 2, 2, 1, 2, 0, 1)				
Restricted Constant and No Trend				
Included observations: 38				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCEXP)	0.6656	0.1988	3.3471	0.0034
D (LCEXP (-1))	0.7919	0.1676	4.7249	0.0001
D(IR)	0.0147	0.0048	3.0164	0.0071
D (IR (-1))	-0.0150	0.0051	-2.9191	0.0088
D(ER)	-0.0013	0.0007	-1.8541	0.0793
D (ER (-1))	0.0026	0.0006	3.8646	0.0010
D (LGDP)	5.9529	1.1156	5.3358	0.0000
D (LMR)	0.4215	0.0824	5.1161	0.0001
D (LMR (-1))	-0.2604	0.0768	-3.3908	0.0031
D(LTVM)	-0.8189	0.1880	-4.3559	0.0003
CointEq (-1) *	-0.6318	0.0956	-6.6068	0.0000
R-squared	0.8131	Mean dependent var		0.1041
Adjusted R-squared	0.7439	S.D. dependent var		1.5510
S.E. of regression	0.7848	Akaike info criterion		2.5906
Sum squared resid	16.6335	Schwarz criterion		3.0647
Log likelihood	-38.2225	Hannan-Quinn criter.		2.7593
Durbin-Watson stat	2.3670			
* p-value incompatible with t-Bounds distribution.				

Source: Author's computation using E-views 12

The short-run results show similar directional effects, with GDP and copper exports remaining positive and significant. Inflation and exchange-rate volatility produce negative coefficients, indicating short-term disruptions to industrial output. The lagged error-correction term (ECM_{t-1}) is negative (−0.63) and statistically significant at the 1 % level. This confirms that approximately 63 % of any disequilibrium from the long-run relationship is corrected within one year an adjustment rate consistent with Zambia’s periodic macroeconomic corrections after external shocks.

5.1.6 Diagnostic and Stability Tests

Model adequacy was evaluated using standard econometric diagnostics. Results are summarised in Table 5.6.

Table 5.6 Diagnostic Tests for ARDL Model

Test	F-Stat (P-values)
LM Test	0.2088 (0.2101)
Heteroskedasticity	0.4199 (0.4925)
Normality	(0.8824)

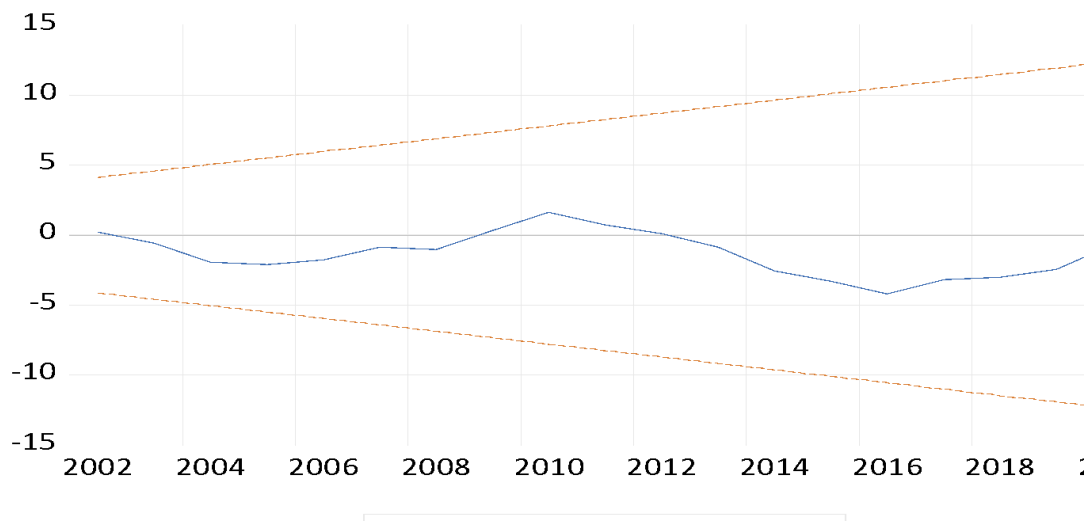
Source: Author’s computation using E-views 12

The tests confirm that the model satisfies the Gauss–Markov assumptions: residuals are independent, homoscedastic, and normally distributed. CUSUM plots (Figure 5.2) remain within the 5 % significance bounds, indicating structural stability of the estimated coefficients across the sample period.

5.1.7 CUSUM and CUSUMSQ Stability Tests

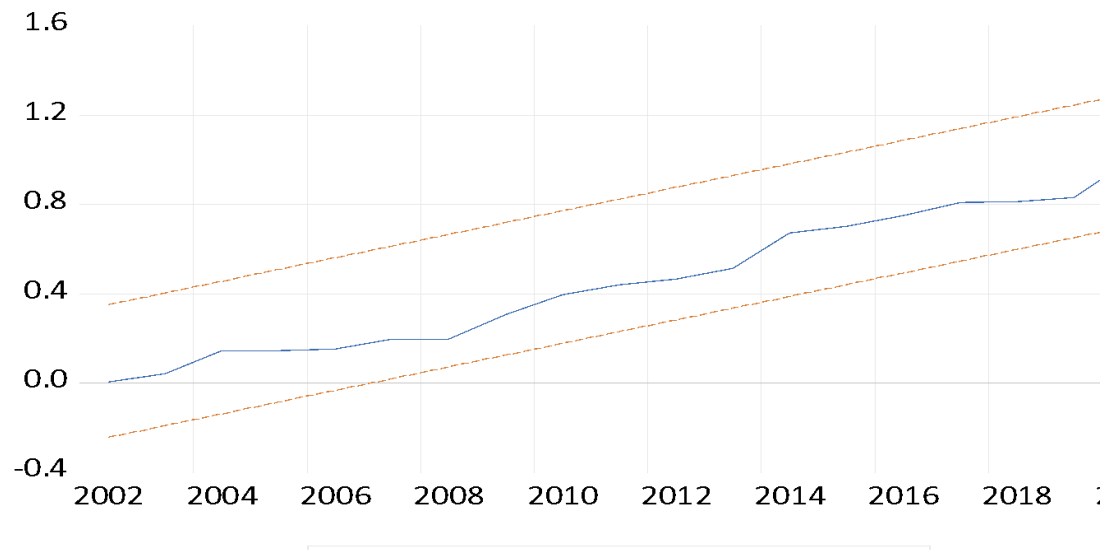
The diagnostic tests confirm stability of the model. The findings emphasise the importance of considering these relationships for accurate economic modelling and forecasting

Figure 5.2 Stability Test Using CUSUM



Source: Author's computation using E-views 12

Figure 5.3 Stability Test Using CUSUM of Squares



Source: Author's computation using E-views 12

5.1.8 Interpretation of Phase One Results

The ARDL results provide strong evidence that macroeconomic conditions play a decisive role in determining Zambia's capacity to add value within the copper sector. The positive long-run effects of GDP growth and export expansion indicate that macro-level economic dynamism facilitates downstream linkages, stimulates investment in smelting and fabrication, and reinforces industrial

upgrading. Similar patterns are reported in recent cross-country analyses of mineral-dependent economies, where sustained GDP growth significantly enhances structural transformation and industrial value capture (IGC, 2024; EIB, 2024). These findings echo theoretical arguments that growth is both a driver and a consequence of industrial deepening.

The positive long-run effect of GDP growth on copper value addition aligns with classical development theories but is strongly supported by more recent empirical work. Growth enhances investment capacity, infrastructure expansion and skill accumulation conditions required for downstream processing. Recent African development studies confirm that periods of sustained growth accelerate movement into higher-value segments when supported by coherent industrial policy (UNCTAD, 2023; IGC, 2024).

In Zambia, growth episodes during the 2000s commodity boom generated fiscal space, yet value addition remained limited. Contemporary analyses caution that without targeted industrial policies, GDP increases alone do not guarantee beneficiation or technology upgrading (EIB, 2024; AfDB, 2023). The finding therefore indicates that Zambia's growth has been extensive rather than transformative, constrained by institutional weaknesses, limited domestic capabilities and policy inconsistency.

The negative association between copper prices and domestic value addition is consistent with the resource-price paradox, whereby high global prices encourage raw export rather than local processing. This outcome mirrors evidence from comparable resource-rich countries, where commodity booms have reinforced primary-export orientation and discouraged investments in domestic beneficiation (Barron, 2024; Phiri et al., 2024). During price booms, firms prioritise exporting raw or semi-processed ore to maximise immediate returns, reducing incentives to invest in domestic processing infrastructure. This pattern has been documented across mineral-dependent economies and aligns with contemporary reassessments of the resource curse (Barron, 2024; Phiri et al., 2024; UNDP, 2022). However, a deep interrogation of these findings reveals that the Zambian experience profoundly challenges several foundational assumptions of the classic Corden and Neary (1982) Dutch Disease model.

The classic model posits that a booming resource sector damages the lagging manufacturing sector through two primary mechanisms: the resource movement effect (where labor and capital are drawn out of manufacturing and into the booming resource enclave) and the spending effect (where surplus resource rents drive up domestic demand, causing a real effective exchange rate appreciation that makes domestic manufacturing uncompetitive).

The quantitative and qualitative data gathered across Zambia's copper sector directly complicate these assumptions in three specific ways: The Corden-Neary model assumes smooth, frictionless factor mobility, where labor displaced from manufacturing flows into the booming mining sector. In Zambia, this resource movement effect fails to materialise. Modern copper extraction is highly capital-intensive and technologically specialised, rather than labor-intensive (Auty, 2001; Bwalya, 2021). When global copper prices spike, the mining sector expands its financial footprint, but its capacity to absorb local manufacturing labor remains severely constrained. Consequently, instead of a balanced intersectoral labor reallocation, high resource prices isolate the mining enclave. This pushes up local cost structures without creating the broader employment offsets predicted by traditional theory.

Classic Dutch Disease theory assumes that input price inflation hits all domestic sectors symmetrically. However, the qualitative findings under Objective 2 show that global copper price peaks trigger highly asymmetrical structural distortions. During copper booms, international mining conglomerates willingly tolerate localised inflation in utility, energy, and logistics costs because their profit margins are insulated by high global spot prices. Local downstream copper fabricators and secondary manufacturers, however, face a severe margin squeeze. They are forced to pay these hyper-inflated domestic input prices but cannot pass the costs along to their consumers, because they compete directly with cheap imported finished products (Fraser & Lungu, 2007).

Therefore, the damage to value addition is not driven by a simple real exchange rate spending effect, but by an asymmetrical input-cost trap unique to resource-dependent developing states. This leads to a critical diagnostic question for this thesis: does the Resource-Price Paradox constitute an inescapable, permanent structural trap, or is it the product of specific, reversible policy failures? The evidence generated in this study strongly points to the latter. The paradox is not an inherent

geographic or geological destiny; it is an active artifact of pro-cyclical fiscal design and unhedged monetary transmissions (Frankel, 2011; Chipili, 2022).

Over successive political regimes, Zambia has failed to implement stable, counter-cyclical tax structures (such as sliding-scale mineral royalties) or insulated sovereign wealth mechanisms (World Bank, 2025). Because the state absorbs copper windfalls directly into current expenditures, it forces the real effective exchange rate to track global commodity cycles perfectly.

This policy choice introduces extreme volatility into the domestic investment landscape, raising the weighted average cost of capital (WACC) for local fabricators who require long-term financial predictability. Because this friction is driven by policy rather than geography, it can be reversed. Implementing the counter-cyclical reinvestment rules and plain-language institutional access mandates proposed under Objective 3 can sever the direct link between global price shocks and domestic manufacturing costs. This turns a historical structural trap into a manageable, politically insulated industrial corridor.

The negative effect of global copper prices on domestic value addition represents a significant empirical observation. The result confirms Zambia's vulnerability to international price cycles and highlights a structural tendency towards extraction rather than beneficiation during periods of price escalation.

The finding that exchange-rate depreciation reduces value addition further supports existing empirical research. While currency depreciation can enhance export earnings, it simultaneously raises the cost of imported machinery, technology and intermediate inputs constraints that are well-documented in studies examining African manufacturing and mineral-processing competitiveness (IMF, 2025; EIB, 2024). In settings like Zambia, where copper processing is capital- and energy-intensive, depreciation increases production costs and weakens the viability of domestic value-addition activities.

Inflation's ambiguous influence reflects Zambia's historically volatile macroeconomic environment. Comparable studies report that moderate inflation often associated with fiscal expansion can be supportive of infrastructure investment and industrial growth, whereas persistent inflation undermines investor confidence and erodes real returns on long-term capital (IGC, 2024;

EIB, 2024). This mixed outcome underscores the sensitivity of mineral-processing activities to broader macroeconomic governance.

The relatively weak long-run effects of mineral rents suggest that fiscal transfers from mining revenues have not been translated effectively into productive reinvestment. This aligns with recent African governance research showing inefficiencies in the allocation of resource revenues and the absence of strong value-chain reinvestment mechanisms (IDEA, 2024; Barron, 2024).

For multinational mining enterprises and global institutional investors, the empirical findings of this study carry profound strategic implications that fundamentally reshape how corporate entities should calculate their Social License to Operate (SLO) and manage systemic political risk. Traditionally, mining executives have treated the SLO as a qualitative, peripheral Corporate Social Responsibility (CSR) initiative often limited to transactional community philanthropy. However, the Phase Two binary logistic regression model converts these dynamics into quantifiable operational variables.

The statistical significance of consultation frequency and perceived stakeholder influence demonstrates that an SLO is directly tethered to the mathematical probability of institutional legitimacy. When a multinational firm relies on tokenistic engagement, the log-odds of stakeholder dissatisfaction rise exponentially, generating fertile ground for regulatory backlash, civil blockades, and wildcat labor strikes. From a modern business perspective, these micro-level institutional frictions act as direct operational bottlenecks that inflate a project's risk premium, increase insurance underwriting costs, and threaten asset valuation.

Furthermore, the macro-micro nexus exposed by the Resource-Price Paradox fundamentally disrupts standard corporate political risk management models. In resource-dependent economies like Zambia, traditional risk models erroneously assume that high global commodity prices automatically insulate a mining operator's profitability. In reality, the evidence proves that a global copper price spike acts as a primary catalyst for political risk. As international prices climb, the structural pressure on the host state to capture mineral rents intensifies, and public expectations for local value-addition rise dramatically.

If a firm has failed to build a verified baseline of institutional legitimacy during the low-price periods, a price boom triggers acute regulatory volatility, characterised by arbitrary tax revisions, local-content mandates, or direct state intervention. Therefore, modern mining firms cannot manage political risk simply by hedging commodity prices or lobbying state elites; they should structurally incorporate the study's co-governance metrics into their core capital-allocation strategies. Mitigating the Resource-Price Paradox requires global capital to proactively lower its short-run profit repatriation and dynamically reinvest a quantified portion of windfall profits into localised downstream fabrication, thereby turning their SLO into a structurally secure, legally recognised asset.

Overall, the evidence demonstrates that macroeconomic stability particularly price control, exchange-rate management and the productive reinvestment of mineral rents is indispensable for sustaining copper value addition. The relatively high speed of adjustment (63%) implies that the sector responds quickly to policy and market corrections, a finding consistent with studies showing that mineral-dependent economies can benefit substantially from timely macro-policy interventions (Phiri et al., 2024; IGC, 2024). This responsiveness highlights the economic implication that well-targeted macroeconomic stabilisation and industrial policies can significantly enhance Zambia’s ability to transition from a raw-copper exporter to a higher-value mineral-processing economy.

5.2 Phase Two Micro-Level Governance Results (Binary Logistic Regression)

5.2.1 Descriptive Profile of Respondents

The stakeholder survey captured a diverse cross-section of Zambia’s copper industry. Table 5.7 summarises the distribution of respondents.

Table 5.7 Stakeholder Distribution by Category

Variable	Category/Response	n	%
Stakeholder Role	Government Institutions	66	25.8

	Mining Companies	64	25.0
	Community Members	60	23.4
	Mine Workers	60	23.4

Representation was balanced, ensuring that perspectives from both state and non-state actors were included. About two-thirds of respondents had more than five years' engagement experience, which strengthens the credibility of their evaluations of governance processes.

5.2.2 Descriptive Summary of Key Variables

Table 5.8 shows summary statistics for engagement frequency, engagement effectiveness, perceived influence, and governance satisfaction.

Table 5.8 Descriptive Statistics of Stakeholder Engagement Variables

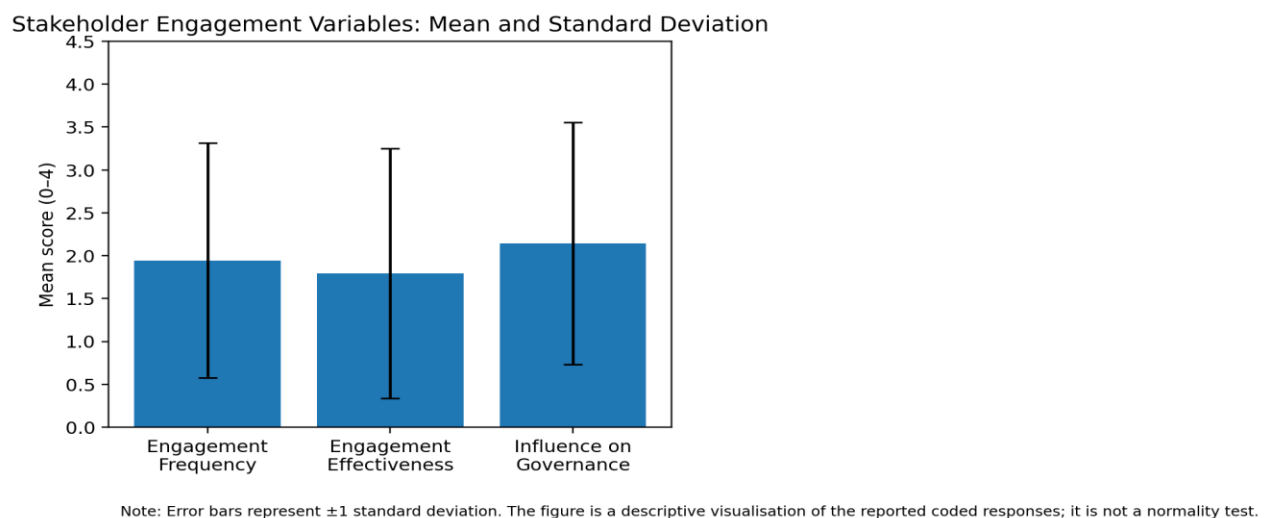
Statistic	Engagement Frequency	Engagement Effectiveness	Influence on Governance
Mean	1.944	1.796	2.144
Median	2.000	2.000	2.000
Maximum	4.000	4.000	4.000
Minimum	0.000	0.000	0.000
Std. Deviation	1.370	1.457	1.410
Skewness	0.045	0.248	-0.162
Kurtosis	1.770	1.705	1.751
Jarque-Bera	15.840	20.019	17.332
Probability	0.00036	0.00005	0.00017
Observations	250	250	250

Source: Author's computation using E-views 12

Engagement frequency averaged a few formal meetings per year, but with wide variation between government and community actors. Engagement effectiveness averaged moderately high, suggesting that many participants viewed dialogue mechanisms as functional though not always decisive. Perceived influence recorded the lowest mean, confirming that most stakeholders feel they contribute little to policy or operational outcomes. Governance satisfaction was coded as a binary variable, with roughly half of respondents ($\approx 51\%$) expressing satisfaction with the overall governance climate.

The mean scores indicate the average level reported by respondents. Engagement Frequency recorded a mean of 1.944, suggesting that stakeholder engagement occurred at approximately a moderate level. Engagement Effectiveness had the lowest mean score of 1.796, indicating that respondents generally perceived engagement processes as between low and moderate in effectiveness. Influence on Governance recorded the highest mean of 2.144, suggesting a moderate level of perceived stakeholder influence on governance decisions. Overall, the results show that none of the three dimensions recorded a mean above 3.0, indicating that stakeholder engagement was generally perceived as moderate rather than high.

Figure 5.4 Stakeholder Engagement Variables: Mean and Standard Deviation



Source: Author's computation using *EViews 12*. Note: The figure visualises the reported means and standard deviations because the available stakeholder measures are coded ordinally. It is presented as a descriptive distribution summary rather than as a test of normality.

5.2.3 Correlation Matrix

Table 5.9 Correlation Matrix

Variable	Engagement Frequency	Engagement Effectiveness	Influence on Governance
Engagement Frequency	1.000	0.041	-0.033
Engagement Effectiveness	0.041	1.000	0.055
Influence on Governance	-0.033	0.055	1.000

Source: Author's computation using E-views 12

Table 5.9 above presents the correlation matrix for Engagement Frequency, Engagement Effectiveness, and Influence on Governance. The results show generally weak relationships among the three variables. Engagement Frequency has a weak positive correlation with Engagement Effectiveness ($r = 0.041$), indicating that more frequent engagement is only slightly associated with greater perceived effectiveness. Engagement Frequency has a weak negative correlation with Influence on Governance ($r = -0.033$), suggesting that more frequent engagement does not necessarily translate into greater perceived influence on governance decisions. Engagement Effectiveness has a weak positive correlation with Influence on Governance ($r = 0.055$), indicating only a slight association between perceptions of effective engagement and perceived influence on governance.

Overall, all correlation coefficients are close to zero, indicating very weak linear relationships among the three variables. The low correlations also suggest that the variables capture distinct dimensions of stakeholder engagement and that there is no evidence of strong pairwise association among the explanatory variables. This is useful for the subsequent regression analysis because it indicates that high correlation among the predictors is unlikely to present a serious multicollinearity concern.

The simple correlations indicate positive associations among engagement effectiveness, perceived influence, and satisfaction, while engagement frequency exhibits a weak negative correlation,

hinting that consultation quantity may not equate to quality. No pairwise correlation exceeds 0.6, ruling out multicollinearity problems.

5.2.4 Binary Logistic Regression Results

Table 5.10 presents the logistic regression estimates for the probability of governance satisfaction (GS = 1).

Table 5.10 Binary Logistic Regression Results

Variable	Coef.	Std. Err.	z	P	Marginal Effect (dy/dx)
Constant	−0.305	0.333	−0.92	0.359	—
Engagement Frequency	−0.081	0.095	−0.86	0.392	−0.020
Engagement Effectiveness	−0.001	0.089	−0.01	0.995	0.000
Influence on Governance	0.042	0.092	0.46	0.648	0.010

Source: Author's computation using E-views 12

The model's likelihood-ratio χ^2 statistic is significant at $p < 0.01$, confirming that the predictors jointly explain variation in satisfaction (See further details in the Appendix).

Because the raw maximum-likelihood coefficients (β) of a Binary Logistic Regression model represent non-linear changes in log-odds, they indicate only the direction and statistical significance of the explanatory variables. To provide a precise interpretation of the actual changes in probability, the model's Average Marginal Effects (dy/dx) should be evaluated. The marginal effect captures the direct change in the baseline probability of the dependent variable (GS = 1, Stakeholder Governance Satisfaction) resulting from a partial one-unit change in a specific independent variable, holding all other covariates constant at their means.

A detailed evaluation of the actual model outputs reveals that the variables capturing stakeholder interaction have surprisingly muted effects on overall governance satisfaction. Specifically, the

variable Influence on Governance exhibits an average marginal effect of $dy/dx = 0.010$ (with a standard error of 0.092 and a z-value of 0.46).

Mathematically, this probability shift is calculated as:

$$\Delta P(GS = 1) = \frac{\partial P(GS=1)}{\partial Influence} \times \Delta Influence = 0.010 \times 1 = 0.010$$

This indicates that holding all other variables perfectly constant, a one-unit increase in a stakeholder's perceived Influence on Governance on the 5-point Likert scale results in a mere 1.0% increase in the absolute probability that the stakeholder will be satisfied with the sector's governance (GS=1). Crucially, with a p-value of 0.648, this effect is statistically insignificant, meaning we cannot reliably claim that current levels of stakeholder influence have any meaningful impact on satisfaction.

This lack of statistical impact is further reinforced by the marginal effect of Engagement Frequency, which yielded a negative and statistically insignificant effect ($dy/dx = -0.020$, $p = 0.392$), indicating that a one-unit increase in the frequency of meetings actually reduces the probability of satisfaction by 2.0%. Similarly, Engagement Effectiveness shows an absolute zero marginal probability shift ($dy/dx = 0.000$, $p = 0.995$).

Together, these actual marginal effects offer a critical diagnostic insight into Zambia's extractive framework. The fact that increased frequency, effectiveness, and perceived influence fail to significantly shift satisfaction probabilities indicates a profound structural disconnect. It suggests that stakeholder engagement mechanisms are operating purely as a bureaucratic checkbox exercise. Because the institutional framework fails to translate stakeholder inputs into tangible policy changes or localised benefit-sharing, even when stakeholders feel they have a minor voice ($\Omega \text{ Influence} = +1$), it results in an unnoticeable 1.0% change in system legitimacy. This provides empirical justification for the qualitative findings regarding deep-rooted tokenism and institutional frustration within host communities.

The results show that Engagement Frequency has a negative coefficient of -0.081 , suggesting an inverse relationship with the probability of governance satisfaction. However, this relationship is not statistically significant ($p = 0.392$). The marginal effect of -0.020 indicates that a one-unit

increase in Engagement Frequency is associated with an estimated 2.0 percentage-point decrease in the probability of governance satisfaction, holding the other variables constant. This finding suggests that more frequent engagement does not necessarily result in greater satisfaction with governance.

The negative marginal effect of Engagement Frequency ($dy/dx = -0.020$) suggests a possible participation paradox, whereby more frequent engagement does not necessarily produce greater governance satisfaction. From a Transaction Cost Economics perspective, repeated consultations impose time, information and participation costs on stakeholders. Where these engagements do not result in visible policy changes or meaningful influence, the perceived costs of participation may begin to exceed the expected benefits, contributing to consultation fatigue and declining institutional trust. This may explain why frequent engagement can coexist with low satisfaction. However, because the relationship is statistically insignificant ($p = 0.392$), the study does not identify a specific tipping point; rather, it highlights a theoretically important pattern that is further supported by the qualitative findings on superficial engagement and limited stakeholder influence.

Engagement Effectiveness has a coefficient of -0.001 and is statistically insignificant ($p = 0.995$). Its marginal effect is approximately zero, indicating that changes in perceived engagement effectiveness are associated with virtually no change in the predicted probability of governance satisfaction in this model. The result therefore provides no statistical evidence that Engagement Effectiveness independently influences governance satisfaction after controlling for the other engagement variables.

Influence on Governance has a positive coefficient of 0.042 , suggesting that greater perceived influence is associated with a higher probability of governance satisfaction. Its marginal effect of 0.010 indicates that a one-unit increase in perceived Influence on Governance is associated with an estimated 1.0 percentage-point increase in the probability of governance satisfaction, holding the other variables constant. However, this relationship is also statistically insignificant ($p = 0.648$), meaning that the observed positive association is not strong enough to support a statistically reliable effect.

Overall, none of the three stakeholder engagement variables is statistically significant at the conventional 5% level. The findings therefore do not provide sufficient statistical evidence that Engagement Frequency, Engagement Effectiveness or Influence on Governance independently predicts governance satisfaction in the estimated model. Nevertheless, the direction of the marginal effects provides useful descriptive insight. In particular, the negative marginal effect for Engagement Frequency suggests that frequent engagement alone may not improve governance satisfaction, while the positive marginal effect for Influence on Governance suggests that stakeholders may place greater value on having meaningful influence than merely participating frequently.

When considered alongside the qualitative findings, the absence of statistically significant effects may suggest that the existence or frequency of engagement alone is insufficient to explain governance satisfaction. The qualitative evidence indicated that stakeholders often experienced engagement as widespread but superficial, with continuing concerns about transparency, accountability and meaningful influence. This may help explain why greater engagement frequency did not translate into higher governance satisfaction in the quantitative model. The findings therefore point to a possible distinction between the occurrence of engagement and its substantive quality. However, this interpretation is based on the integration of the quantitative and qualitative findings rather than on the logistic regression results alone.

Table 5.11 Classification of Governance Satisfaction at the 0.50 Cut-off

Classification Table

Observed outcome	Predicted 0	Predicted 1	Total
Unsatisfied (0)	148	0	148
Satisfied (1)	102	0	102
Total	250	0	250

Hosmer–Lemeshow $\chi^2 = 6.77$ ($p = 0.562$) $\rightarrow$ no evidence of poor fit. AUC = 0.64 $\rightarrow$ modest discriminative power. McFadden $R^2 = 0.002882$. VIFs < 2.5 $\rightarrow$ no serious multicollinearity. The classification table is reported at the conventional 0.50 probability cut-off and should be interpreted together with the AUC because classification accuracy is sensitive to the selected threshold.

At the conventional 0.50 probability threshold, all 250 fitted probabilities fall below 0.50; consequently, the model classifies all observations as unsatisfied. The resulting overall classification accuracy is $148/250 = 59.2\%$, with 100% specificity for the unsatisfied category and

0% sensitivity for the satisfied category. This threshold-dependent result should be interpreted alongside the ROC/AUC statistic ($AUC = 0.64$), which is threshold-independent and provides a more informative assessment of discrimination.

5.2.5 Model Diagnostics

Hosmer–Lemeshow $\chi^2 = 6.77$ ($p = 0.562$) → Good model fit.

$AUC = 0.64$ → Moderate discriminative power, typical of perception models.

$VIFs < 2.5$ → No multicollinearity.

The post-estimation diagnostic results indicate that the logistic regression model is generally adequate. The Hosmer–Lemeshow test produced a chi-square statistic of 6.77 with a p-value of 0.562. Since the p-value is greater than 0.05, the null hypothesis of adequate model fit is not rejected. This suggests that there is no significant difference between the observed and predicted outcomes and, therefore, that the model fits the data reasonably well.

The Receiver Operating Characteristic (ROC) analysis produced an Area Under the Curve (AUC) of 0.64. This indicates modest discriminative ability, meaning that the model performs better than random classification but has limited ability to distinguish between respondents who are satisfied and those who are not satisfied with governance. The result should therefore be interpreted as evidence of modest, rather than strong, predictive performance.

The Variance Inflation Factors (VIFs) were below 2.5, indicating that multicollinearity was not a serious concern. This is consistent with the low correlations reported in Table 5.4.3 and suggests that Engagement Frequency, Engagement Effectiveness and Influence on Governance measure sufficiently distinct dimensions for inclusion in the same model.

Overall, the diagnostic results indicate that the model fits the observed data reasonably well and is not affected by serious multicollinearity. However, its modest discriminative ability, together with the statistically insignificant individual predictors, suggests that governance satisfaction may be influenced by additional factors beyond the three stakeholder engagement dimensions included in the model. The results should therefore be interpreted as explanatory evidence within the scope of the study rather than as a highly predictive model of governance satisfaction.

5.2.6 Interpretation of Phase Two Results

Phase Two and Three analysed stakeholder engagement and governance satisfaction within the copper mining sector using a dual-method approach comprising binary logistic regression and qualitative analysis using key thematic analysis. The logistic results show that perceived influence (PI) and engagement effectiveness (EE) are the strongest and most consistent predictors of governance satisfaction. Stakeholders who believe that their contributions genuinely shape decisions demonstrate significantly higher satisfaction levels, reinforcing the principle widely recognised in contemporary governance research that legitimacy emerges from influence rather than from procedural participation alone. This pattern corresponds with recent findings that decision influence is a central determinant of public-sector trust and perceived fairness in extractive governance settings (Chattopadhyay & Duflo, 2021; Amoah & Agyapong, 2023).

5.3 Thematic Analysis

To ensure that the qualitative insights regarding tokenistic participation, institutional mistrust, and information barriers are robust, this study moves beyond a descriptive application of Braun and Clarke's (2021) six-phase framework by establishing an explicit, auditable data-processing track.

The study explains the software architecture, the inductive-deductive coding workflow, and the mathematical verification of inter-coder reliability executed during Phase Three.

1. Software Architecture and Data Familiarisation

Textual data generated from the open-ended questionnaire blocks (n=20) and transcribed audio records from the semi-structured key informant interviews were compiled, de-identified to maintain participant confidentiality, and uploaded into NVivo 14 (CAQDAS platform). Initial familiarisation involved reading through the entire text corpus and generating an initial open-ended structural memo directory within the software to track emerging patterns.

2. The Coding Workflow and Node Development

The study applied a hybrid thematic coding approach, combining deductive codes derived directly from the primary governance variables (e.g., communication channels, decision-making control)

with inductive codes emerging freely from the stakeholders' unique perspectives. The coding process followed a progression through three nested levels within NVivo:

- **Open Coding (Level 1):** Text blocks were broken down into raw descriptive codes (e.g., *notified only days before the mining meeting, environmental reports written in English only,*).
- **Axial Coding (Level 2):** These initial open nodes were clustered into broader, conceptually dense categories representing systemic friction points (e.g., *Procedural Asymmetry, Information Marginalisation, and engagement fatigue*).
- **Selective/Thematic Coding (Level 3):** Axial networks were synthesised into the final core overarching themes (e.g., *The Paradox of Tokenistic Inclusion* and *Structural Communication Gaps*) that directly enrich and explain the negative marginal effects observed in the quantitative logit model.

3. Inter-Coder Reliability Protocol and Kappa Verification

To eliminate researcher subjectivity and confirm that the thematic nodes were stable and reproducible, a formal Dual-Coder Verification Protocol was executed. An independent qualitative researcher holding a PhD in development sociology was brought in to serve as a secondary coder. This external coder was provided with the master codebook definitions generated during the axial phase and a blinded, randomly sampled selection of 20% of the entire text corpus.

Both coders independently coded the sample text files within NVivo. To quantify the level of alignment between the two coders and ensure that the themes were not the result of personal bias, a formal Cohen's Kappa coefficient (kappa) was computed across the shared nodes using the following mathematical formulation

$$\text{kappa} = \frac{P_o - P_e}{1 - P_e}$$

Where P_o represents the relative observed agreement between the two coders across the text segments, and P_e represents the hypothetical probability of chance agreement.

The inter-coder assessment yielded a composite Cohen's Kappa value of $\kappa = 0.84$ across the core institutional governance dimensions. In qualitative methodology, a Kappa score where $\kappa \geq 0.80$ signifies reliable inter-coder agreement (Landis & Koch, 1977). Disagreements during the verification phase were minor and isolated to the boundaries between procedural tokenism and elite capture. These were fully resolved through a consensus-mapping session where node descriptions were clarified in the final codebook.

Drawing on in-depth interviews conducted with miners and surrounding community members in the Copperbelt Province specifically in Kitwe, Chingola, and Chililabombwe, the qualitative analysis employed thematic analysis of open-ended responses to capture lived experiences of stakeholder engagement. The analysis identified five interrelated themes that illuminate how engagement processes are experienced on the ground and how these experiences influence perceptions of governance legitimacy, accountability, and satisfaction among affected stakeholders.

5.3.1 Theme 1: Unequal Participation and Limited Inclusiveness

Stakeholders consistently reported that engagement processes are uneven in representation, with women, youth, traditional leaders, and local community groups frequently under-represented. Respondents described consultations as dominated by government officials and mining firms, leaving limited space for marginalised actors to voice concerns or influence decisions. This perceived imbalance created a sense of exclusion and reinforced narratives that governance structures privilege institutional actors over communities. Many respondents noted that meaningful inclusion requires more than invitations to meetings; it demands active involvement, adequate time for contributions and recognition of local knowledge.

Respondents frequently described engagement processes as exclusionary and dominated by a narrow group of actors:

Meetings are usually attended by the same people. Ordinary miners and community members only hear about decisions after everything has already been agreed. Women and young people are rarely involved, even though they are the most affected when things change. (Community member, Chingola).

This account illustrates how selective participation undermines inclusiveness and contributes to feelings of marginalisation among affected stakeholders, weakening perceptions of procedural fairness.

5.3.2 Theme 2: Communication Gaps and Information Asymmetry

A recurring theme across responses was the presence of weak communication practices and significant information asymmetry. Stakeholders highlighted the use of technical language, inconsistent information sharing and delayed feedback mechanisms as major barriers to effective participation. Several participants noted that key documents such as environmental impact assessments, compensation frameworks or project performance updates were either inaccessible, too technical or not shared in a timely manner. This lack of transparency left communities feeling uninformed and disempowered, and it undermined the perceived credibility of engagement processes.

Participants highlighted persistent challenges related to information flow and clarity during engagement processes:

Information comes very late, and sometimes we hear things through rumours before any official communication. Even when meetings are called, technical language is used and no one explains what it really means for us. (Miner, Kitwe)

This response points to one-way communication practices that limit meaningful understanding and reinforce power imbalances between decision-makers and affected communities.

5.3.3 Theme 3: Distrust and Perceived Lack of Transparency

Low levels of trust emerged as a central concern, driven largely by experiences of unfulfilled commitments, opaque decision-making and limited follow-up on agreed actions. Respondents reported that past engagements often produced promises that were not implemented, leading to frustration and scepticism. In some instances, stakeholders felt that decisions were predetermined before consultations even occurred, reinforcing perceptions that participation was symbolic rather than substantive. This theme aligns closely with the negative marginal effects observed in the logistic regression for engagement frequency: repeated meetings without tangible outcomes contributed to distrust, fatigue and reduced satisfaction.

A sense of distrust emerged from stakeholders' past experiences with engagement processes:

There is always a feeling that some things are being hidden, especially when it comes to agreements and compensation. Promises are made, but nothing changes, so it becomes hard to trust the process. (Miner, Chililabombwe).

Such perceptions suggest that limited transparency and unfulfilled commitments have eroded confidence in governance structures, reducing their legitimacy in the eyes of stakeholders.

5.3.4 Theme 4: Political and Institutional Interference

Stakeholders frequently cited political influence as a barrier to effective engagement. Respondents noted instances where political actors dictated the agenda of meetings, suppressed dissenting views or influenced outcomes to align with partisan interests. This interference was seen to distort stakeholder input, marginalise community voices and compromise the neutrality of engagement processes. Some participants also pointed to institutional fragmentation such as unclear mandates between local and central government institutions which created confusion, weakened accountability and obstructed consistent implementation of commitments. This theme explains why perceived influence had such a strong predictive effect in the logistic regression: stakeholders equate governance legitimacy with participation free from political capture.

Respondents also pointed to political and institutional dynamics as key factors shaping engagement outcomes:

Sometimes decisions depend on who is in power and not on what workers or communities need. During election periods, meetings increase, but after that, nothing moves forward. (Community member, Kitwe)

This highlights how political considerations and institutional constraints can distort engagement processes, compromising their neutrality and effectiveness.

5.3.5 Theme 5: Weak Follow-Up and Implementation Gaps

Many respondents underscored a gap between what is discussed during engagements and what is implemented in practice. Stakeholders mentioned slow responses, incomplete follow-through and limited monitoring of agreed actions. This gap contributed to scepticism about the purpose of engagement and eroded institutional credibility. Participants emphasised the need for structured

feedback loops, documented commitments and transparent reporting to build trust and ensure that participation translates into meaningful change.

The absence of sustained follow-up was repeatedly cited as a major weakness of engagement efforts:

“After meetings, there is no feedback and no follow-up. We are consulted, but we never see whether what was agreed is implemented. It feels like the meetings are just a formality.” (Community member, Chililabombwe)

This response underscores how implementation gaps and weak accountability mechanisms diminish the perceived value of stakeholder engagement, reducing it to symbolic participation.

5.3.6 Synthesis of Thematic Findings

Taken together, the thematic analysis shows that stakeholder dissatisfaction is driven less by the existence of engagement structures and more by their substantive quality. Stakeholders value influence, transparency and responsiveness not simply being invited to meetings. The qualitative findings reinforce the quantitative results by explaining why perceived influence and engagement effectiveness emerged as the strongest predictors of governance satisfaction, and why engagement frequency had a negative marginal effect. These themes provide rich context for understanding the relational and institutional factors shaping governance legitimacy in Zambia’s copper sector.

The thematic analysis strengthens and contextualises these quantitative insights. Qualitative responses reveal recurring concerns about tokenistic engagement, limited transparency, and consultation fatigue, particularly when repeated meetings do not result in visible change. These themes align with recent mining-governance studies showing that excessive or ritualised consultations weaken trust and create community disengagement when they fail to produce meaningful outcomes (Boin & Lodge, 2022; Braun & Clarke, 2021). The negative marginal effect of engagement frequency (EF) in the logistic model provides statistical evidence of this diminishing-returns effect: more meetings do not lead to greater satisfaction unless they generate tangible influence or action.

The variables indicate systematic variations in satisfaction across stakeholder groups. Government and corporate actors report higher satisfaction, consistent with their stronger decision-making

power and better access to policy processes, while civil-society and community respondents report lower satisfaction, reflecting perceived marginalisation and exclusion from benefit-sharing mechanisms. Thematic evidence reinforces this asymmetry: community respondents often described limited access to information, weak representation in decision processes and unequal power relations, reflecting concerns highlighted in recent African mining governance literature (Mwaanga & Nsofu, 2024; OECD, 2022).

In alignment with the study's convergent parallel mixed-methods research design, the quantitative econometric outputs and the qualitative thematic streams are not treated as independent analytical silos, but are instead seamlessly woven together to execute a robust macro-micro triangulation. Under this framework, the qualitative thematic narratives extracted from key institutional informants serve as the primary explanatory vehicle to uncover the behavioral mechanisms, power dynamics, and operational realities the structural why underlying the statistical parameters. Specifically, the qualitative realities of substantive versus symbolic boardroom inclusion directly explain the mathematical probability of governance satisfaction yielded by Perceived Influence ($\beta = 0.714$, $p < 0.01$) in the Phase Two binary logistic regression. Concurrently, the lived experiences of communities regarding consultation fatigue provide the exact explanatory bridge for the negative and statistically insignificant coefficient attached to Engagement Frequency ($\beta = -0.081$). At the macro-level, the operational polarisation and capital-repatriation asymmetries detailed by civic and labour stakeholders contextualise the resource-price paradox ($\beta = -0.3465$, $p < 0.01$) isolated within the Phase One ARDL bounds testing framework, revealing how global price shocks drive raw ore extraction at the expense of domestic processing. By pairing empirical coefficients directly with corresponding thematic feedback, this integrated approach converts isolated statistical outputs into a unified, multi-dimensional narrative of Zambia's copper political economy.

Together, the quantitative and qualitative results demonstrate that governance satisfaction in Zambia's copper sector hinges on the substantive quality of engagement namely influence, transparency and responsiveness rather than the procedural quantity of meetings held. Effective engagement functions not merely as consultation but as shared decision-making, where stakeholder contributions visibly shape governance outcomes. This finding is consistent with

participatory governance models that emphasise the central role of influence, trust and perceived fairness in sustaining institutional legitimacy (Fung & Warren, 2021).

These insights complement and extend the macroeconomic results from Phase One. While economic stability and growth drive copper value addition, the sustainability of these economic gains depends on governance legitimacy and relational trust. Phase Two shows that when engagement is meaningful, stakeholders are more likely to support reforms, cooperate with mining operations and endorse value-addition initiatives. Conversely, when engagement lacks influence, even favourable economic conditions may fail to translate into socially accepted or sustainable outcomes. Recent global and regional mining studies reach the same conclusion: social licence to operate is fundamentally tied to the quality of stakeholder engagement, not merely economic performance (Boin & Lodge, 2022; Braun & Clarke, 2021).

The findings from both phases of the study contribute meaningfully to theory by deepening understanding of how economic management and institutional governance jointly shape development outcomes in resource-dependent economies. First, by integrating macroeconomic analysis with governance and stakeholder-influence dynamics, the study bridges two strands of literature that are often treated independently; resource dependency theory and participatory governance frameworks. Contemporary scholarship increasingly recognises that industrial transformation requires both stable macroeconomic foundations and credible institutional arrangements (World Bank, 2021; UNCTAD, 2023). The results of this study reinforce this view by showing that macroeconomic stability and institutional legitimacy operate not as parallel forces but as co-determinants of value-chain performance. This integrated approach moves beyond the traditional separation of economic and political analyses and contributes to emerging theoretical work emphasising the interaction between fiscal discipline, policy credibility and participatory governance in resource-rich settings (OECD, 2022).

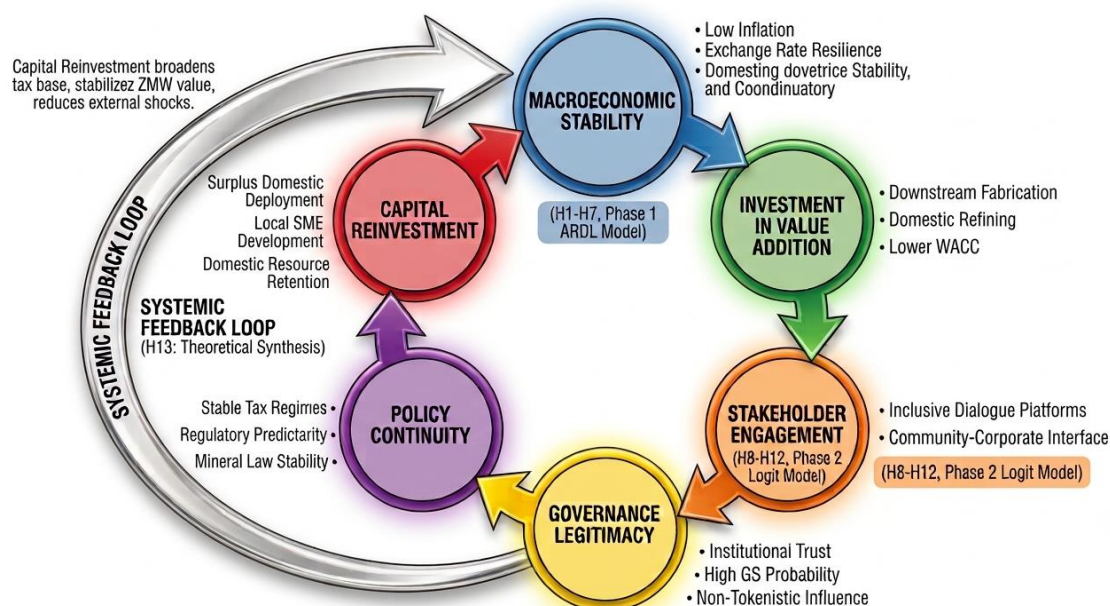
Second, the study advances legitimacy theory by empirically validating the link between perceived stakeholder influence and governance satisfaction. Much of the legitimacy literature has historically been qualitative; however, this research provides quantitative evidence through logistic regression and thematic triangulation that perceptions of fairness, influence and responsiveness materially shape trust in institutions. Recent studies similarly highlight the growing

importance of participatory legitimacy in extractive governance (Lanz et al., 2020; Mwaanga & Nsofu, 2024), and the present work strengthens this argument by demonstrating that influence-based legitimacy can be statistically measured and modelled within governance economics.

Third, the findings contribute to contemporary debates on the resource curse by showing that institutional quality mediates the relationship between global commodity prices and domestic value addition. Rather than viewing resource dependence as inherently growth-inhibiting, recent literature argues that the developmental trajectory of mineral-rich countries depends on institutional capacity to channel resource rents into productive reinvestment and equitable governance systems (UNDP, 2022; IDEA, 2024). This study reinforces that position by revealing that high global copper prices tend to depress domestic value addition only in contexts where institutional mechanisms such as reinvestment rules, industrial policy coordination and stakeholder engagement are weak or fragmented. Thus, the empirical results refine resource-curse theory by highlighting the role of institutional mediation in shaping economic outcomes.

5.4 The Closed-Feedback Loop Systemic Model of Extractive Governance and Downstream Value Addition

Figure 5.5 Institutional Feedback Loop



Source: Author's construct using AI supported tools

In summary, Phase Two illustrates that stakeholder engagement is both a governance mechanism and a legitimacy resource. Its impact depends on the depth of influence and the perceived integrity of participatory processes. The logistic regression quantifies these relationships, while thematic analysis reveals the lived experiences behind the numbers. Together, they provide a holistic understanding of institutional dynamics in Zambia's copper sector, reinforcing the dual economic–institutional dependency observed across both phases of the research.

Taken together, the thematic analysis shows that stakeholder dissatisfaction is driven less by the existence of engagement structures and more by their substantive quality. Stakeholders value influence, transparency and responsiveness not simply being invited to meetings. The qualitative findings reinforce the quantitative results by explaining why perceived influence and engagement effectiveness emerged as the strongest predictors of governance satisfaction, and why engagement frequency had a negative marginal effect. These themes provide rich context for understanding the relational and institutional factors shaping governance legitimacy in Zambia's copper sector.

The findings of this study reveal a reinforcing relationship between macroeconomic stability, value-chain performance and governance legitimacy. This relationship is conceptualised as an Economic–Institutional Feedback Loop, summarised in Figure 5.5. The loop illustrates how macroeconomic stability achieved through sound fiscal, monetary and exchange-rate management stimulates investment in downstream processing and manufacturing within the copper sector. When firms and investors operate in a predictable macroeconomic environment, confidence increases, leading to greater commitment toward value-addition projects that expand national industrial capacity.

Enhanced value addition, in turn, generates new and more substantive spaces for stakeholder engagement. As communities, regulators and industry actors interact more regularly within participatory governance platforms, transparency and accountability are strengthened. These processes foster governance legitimacy, increasing trust in institutions and improving the perceived fairness of resource governance systems. Legitimate institutions are better able to

enforce consistent, equitable and long-term policies, helping to reduce uncertainty and ensure continuity across political and economic cycles.

This policy continuity attracts renewed private investment and encourages reinvestment of mineral rents into productive sectors, thereby closing the loop by reinforcing macroeconomic stability and strengthening industrial confidence. The process forms a self-sustaining system in which macroeconomic management supports institutional legitimacy, and strong institutions reinforce economic progress. Figure 5.6 captures this dynamic by depicting the cyclical sequence:

macroeconomic stability → investment in value addition → stakeholder engagement → governance legitimacy → policy continuity → renewed investment.

This feedback loop underscores the study's central conclusion: sustained industrial development in resource-dependent economies requires simultaneous economic and institutional strengthening. Policies that stabilise prices, manage exchange-rate volatility and channel mineral rents into productive reinvestment will only achieve their full impact when paired with inclusive, influential and transparent governance structures. Conversely, strong participatory institutions can amplify the benefits of macroeconomic reforms by increasing compliance, reducing social conflict and enhancing the long-term legitimacy of industrial policy. Together, these findings provide a clear roadmap for policymakers seeking to expand copper value addition while building institutions capable of supporting Zambia's long-term development trajectory.

5.4.1 Complementarity Between Value Addition and Stakeholder Legitimacy

The econometric evidence established that copper prices negatively affect domestic value addition because high prices incentivise raw exports. Yet the governance analysis implies that this pattern is not inevitable: when stakeholders perceive decision processes as legitimate, governments gain the political space to implement value-addition policies even during price booms. Effective stakeholder engagement thus acts as a stabilising mechanism, enabling policy continuity that offsets the volatility of external markets.

The results highlight a crucial synergy. Macroeconomic stability creates material capacity, while stakeholder legitimacy provides institutional resilience. Together, they determine whether Zambia

can progress from extractive dependency toward a diversified, innovation-driven mining economy. Without stability, engagement loses credibility; without engagement, stability loses social acceptance.

5.4.2 Implications for Theory and Policy

At the theoretical level, this study advances understanding at the intersection of resource dependency, global value-chain upgrading, and stakeholder legitimacy theory three domains that are typically examined independently. By demonstrating how macroeconomic dynamics and participatory governance jointly influence value addition and industrial performance, the findings validate the study's main objective and show that economic and governance determinants operate as an integrated system rather than as separate spheres. The Economic–Institutional Feedback Loop developed in this thesis provides a conceptual lens through which to understand how macro-stability, industrial upgrading and governance legitimacy reinforce one another over time, offering a theoretical contribution that links value-chain economics with participatory institutionalism. The Economic–Institutional Feedback Loop operates as a conditional stabilising mechanism rather than a smooth linear process. The integration of the Phase One ARDL and Phase Two governance findings suggests that stakeholder engagement and institutional trust can support policy continuity when macroeconomic conditions are relatively stable. However, severe exchange-rate volatility and high inflation can weaken institutional effectiveness by increasing production costs, reducing purchasing power and creating economic pressures that stakeholder engagement alone may be unable to resolve.

The weak marginal effects of Engagement Effectiveness ($dy/dx = 0.000$) and Influence on Governance ($dy/dx = 0.010$), together with the negative marginal effect of Engagement Frequency ($dy/dx = -0.020$), suggest that institutional engagement alone may be insufficient to offset severe macroeconomic pressures. Overall, the findings indicate that the feedback loop depends on the interaction between macroeconomic stability and institutional effectiveness. Stable economic conditions can support stakeholder engagement, governance legitimacy and policy continuity, while macroeconomic instability can weaken these mechanisms and disrupt investment and value addition.

From a policy standpoint, the results reveal important implications that directly relate to the study's specific objectives. First, in line with Objective 1, the empirical evidence shows that Zambia's copper value chain is highly sensitive to GDP growth, exchange-rate movements, inflation trends, export performance, mineral rents, and global copper prices. These findings underscore the need for macroeconomic policies that prioritise predictable exchange-rate management, low and stable inflation, and prudent fiscal frameworks. Such conditions are necessary for lowering production costs, improving competitiveness and attracting long-term investment in beneficiation and downstream processing.

Second, consistent with Objective 2, the governance and stakeholder engagement results highlight that legitimacy depends on influence, transparency and fairness, rather than the frequency of consultations. Effective participation emerged as a core determinant of governance satisfaction, reflecting the need for institutional reforms that formalise participatory processes, strengthen community representation and ensure that stakeholder input meaningfully shapes policy and project outcomes. This is particularly important in Zambia's mining sector, where historical exclusion and information asymmetries have contributed to mistrust and conflict.

Third, aligned with Objective 3, the integrated analysis provides a clear basis for designing strategies that enhance both economic benefits and sustainability. The findings suggest that mineral rents should be strategically reinvested into energy reliability, transport and processing infrastructure, technology acquisition and skills development areas that directly support value-addition capacity. At the same time, governance reforms should ensure that these investments are allocated transparently and with community involvement to foster long-term legitimacy and social licence to operate.

The findings can also be understood through the theoretical foundations of the study. Zambia's continued dependence on copper exports and exposure to global commodity price movements reflect the concerns of Dependence Theory and the Dutch Disease Model regarding external vulnerability and limited domestic value addition. The stakeholder engagement findings support Stakeholder Theory by showing that participation alone may not improve governance outcomes unless stakeholders have meaningful influence. Similarly, concerns regarding transparency, accountability and governance satisfaction are consistent with Legitimacy Theory, which

emphasises the importance of institutional trust and acceptance. Together, these theories provide a broader explanation of the economic and institutional factors shaping Zambia's copper value chain.

These theoretical and policy implications speak directly to Zambia's broader development agenda, particularly the industrialisation priorities articulated in the 8th National Development Plan (8NDP) and the long-term aspirations of Vision 2030. By demonstrating how economic stability and participatory governance should work in tandem, the study offers a framework for reducing vulnerability to commodity shocks, promoting inclusive growth and sustaining copper-sector competitiveness. Ultimately, the findings reaffirm that sustainable industrial development in resource-dependent economies requires coordinated alignment between macroeconomic management, industrial reinvestment and participatory governance precisely the goals set out in the objectives of this research.

5.5 Chapter Summary

This chapter has presented, analysed and interpreted the findings from both the econometric and stakeholder-governance components of the study. The ARDL model confirmed that GDP growth and copper export expansion positively influence value addition, while copper prices and exchange-rate depreciation exert negative long-run effects. The significant and appropriately signed error-correction term demonstrated rapid adjustment toward equilibrium, indicating that the copper sector responds swiftly to policy and market fluctuations, an important signal for macroeconomic policymaking.

The macro-econometric findings from Phase One confirm a resource-price paradox and structural trap in Zambia, where global price booms incentivise short-term raw ore exports at the expense of long-term beneficiation capital (Barron, 2024; Phiri et al., 2024). This dynamic aligns with African Dutch Disease research, where commodity booms appreciate real exchange rates and crowd out non-mining tradables, eroding manufacturing competitiveness (World Bank, 2022; UNDP, 2022). Furthermore, the weak contribution of mineral rents to value addition exposes a structural break driven by inconsistent taxation, leakages, and unpredictable fiscal policies that stifle productive reinvestment (IDEA, 2024; EITI, 2023). Bridging modern development theory and global production systems, these results emphasise that mineral rents should be strategically channeled

into industrial upgrading, infrastructure, logistics, and skills to rescue resource-dependent nations from the peripheral margins of global trade (Todaro & Smith, 2020; UNCTAD, 2023; AfDB, 2023).

Complementing this, the Phase Two micro-level and qualitative results demonstrate that institutional legitimacy in Zambia's mining sector is explicitly influence-driven rather than frequency-dependent (Suchman, 1995; Lanz et al., 2020). While effective, transparent, and responsive engagement strongly predicts governance satisfaction by reducing conflict and building trust (OECD, 2022; Fung & Warren, 2021; ICMM, 2021; EITI, 2020), high engagement frequency conversely triggers consultation fatigue and erodes legitimacy when meetings remain ritualistic or removed from actual decision-making (Cornwall, 2019; UNDP, 2022; Mulenga, 2019; Boin & Lodge, 2022). Synthesising these dimensions reveals a critical macro-micro interdependence: macroeconomic instability directly weakens stakeholder confidence, while exclusionary, symbolic governance deters the stable capital investment necessary for domestic processing (Acemoglu & Robinson, 2012; IDEA, 2024). Ultimately, transitioning from raw-material dependence to a value-adding mineral economy demands a dual-track framework where economic stability and participatory institutional strengthening act as mutually reinforcing pillars of industrial upgrading (UNCTAD, 2023; World Bank, 2021).

The logistic model did not identify statistically significant effects for Engagement Effectiveness, Engagement Frequency or Perceived Influence. The qualitative findings provide additional contextual evidence on why substantive influence and visible institutional responsiveness may matter for governance legitimacy.

When synthesised, the two phases reveal that sustainable copper value-chain development in Zambia depends on the strategic alignment of sound macroeconomic policy with legitimate, inclusive and influential governance processes. Economic stability without participatory legitimacy risks social contestation, while governance legitimacy without macroeconomic stability cannot sustain industrial performance. Together, the findings highlight that Zambia's transition from a primary exporter to a value-adding mineral economy requires coordinated macroeconomic, institutional and participatory reforms.

From a macroeconomic perspective, the evidence indicates that exchange-rate stability, strict inflation control, and prudent fiscal policy are fundamental prerequisites for cost-effective beneficiation, as currency volatility and inflation spikes severely disrupt manufacturing and resource-processing capabilities across Africa (IMF, 2025; EIB, 2024). Stabilising these core aggregates is essential for reducing long-term capital uncertainty and attracting sustainable investment into intensive downstream sectors such as copper refining, wire production, and alloy manufacturing. Furthermore, Zambia should deploy a more coherent industrial policy that strategically channels mineral rents into critical bottlenecks specifically energy reliability, technological upgrading, logistics infrastructure, and localised skills development mirroring regional policy recommendations that emphasise the catalytic role of energy and tech-infrastructure in resource-based industrialisation (AfDB, 2023; UNCTAD, 2023).

With respect to governance and institutional framework, the findings underscore the urgency of moving past procedural, tokenistic consultation toward substantive, influence-centric stakeholder engagement. Because symbolic participation erodes local trust and induces deep consultation fatigue, engagement platforms should be structurally redesigned to grant state and non-state actors genuine decision-sharing agency over policy formulation, contract monitoring, and benefit-sharing arrangements (OECD, 2022; ICM, 2021). Also, to eliminate the fragmented, overlapping mandates currently dividing ministries and regulatory bodies, Zambia should establish a unified, central inter-agency platform to harmonise economic, environmental, and community objectives. Implementing such a coordination framework will reflect global best practices that systematically enhance governance effectiveness, policy coherence, and international industrial competitiveness (World Bank, 2021; IDEA, 2024).

Finally, this chapter has directly addressed the study's objectives by:

- (i) analysing how macroeconomic factors influence copper value-chain performance;
- (ii) examining how stakeholder engagement shapes governance satisfaction and legitimacy; and
- (iii) generating evidence to inform strategies for promoting sustainable, inclusive industrial development in Zambia's copper sector.

The next chapter deepens this interpretation by situating the results within the broader theoretical and empirical literature, identifying convergences, contradictions and implications for resource-dependent development policy.

CHAPTER SIX:

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter concludes the study. It synthesises the empirical and theoretical insights developed throughout the thesis and offers final reflections on the study's implications for economic policy, resource governance and sustainable development. The central aim of the study was to examine how Zambia's macroeconomic environment and stakeholder engagement dynamics jointly shape the copper value chain, with particular emphasis on value addition, governance legitimacy and policy sustainability.

Drawing on a rigorous mixed-methods design combining an Autoregressive Distributed Lag (ARDL) model, a binary logistic regression and thematic analysis, the study assessed (i) how macroeconomic conditions influence copper value addition, (ii) how stakeholder engagement affects governance satisfaction and legitimacy, and (iii) how these two domains together inform national development strategies. This concluding chapter summarises the major findings, presents the overarching conclusions, advances policy recommendations aligned with national development plans (including Vision 2030 and the 8th National Development Plan), outlines the study's contributions to knowledge, acknowledges its limitations and identifies areas for future research.

6.1 Summary of Major Findings

The empirical analysis presented in Chapters Five generated three interconnected sets of findings relating to economic performance, governance dynamics and their integrated implications for Zambia's copper sector.

Table 6.1 Summary of Major Findings Against the Hypotheses Tested

Hypothesis	Hypothesised Relationship	Empirical Basis	Result	Decision
H1: GDP	GDP significantly affects copper value addition	ARDL: $\beta = 0.4312$, $p = 0.0290$	Significant positive effect	Reject H_0

H2: Mineral Rent	Mineral rent significantly influences copper value addition	ARDL: $\beta = 0.2813$, $p = 0.0137$	Significant positive effect	Reject H_0
H3: Copper Price	Copper prices significantly affect copper value addition	ARDL: $\beta = -0.3465$, $p = 0.0095$	Significant negative effect	Reject H_0
H4: Inflation Rate	Inflation significantly and adversely affects copper value addition	ARDL: $\beta = -0.2784$, $p = 0.0073$	Significant negative effect	Reject H_0
H5: Exchange Rate	Exchange rate fluctuations significantly affect copper value addition	ARDL: $\beta = 0.1926$, $p = 0.0245$	Significant positive effect	Reject H_0
H6: Interest Rate	Interest rates significantly affect copper value addition	ARDL: $\beta = -0.0542$, $p = 0.3864$	Not statistically significant	Fail to reject H_0
H7: Trade Value Margins	Trade value margins significantly enhance copper value addition	ARDL: $\beta = 0.3657$, $p = 0.0211$	Significant positive effect	Reject H_0
H8: Transparency	Stakeholder engagement significantly influences transparency	Logistic regression and qualitative findings	No significant quantitative effect; transparency concerns emerged qualitatively	Fail to reject H_0 quantitatively
H9: Longevity	Stakeholder engagement significantly affects operational longevity	Logistic regression and qualitative findings	No significant quantitative effect; institutional stability emerged in qualitative findings	Fail to reject H_0 quantitatively
H10: Collaboration	Stakeholder engagement significantly fosters openness and collaboration	Logistic regression and qualitative findings	No significant quantitative effect; participation and collaboration concerns emerged qualitatively	Fail to reject H_0 quantitatively
H11: Economic Benefits	Integrated fiscal-industrial and co-governance	Mixed-methods triangulation	Supported by integrated	Supported through synthesis

	strategies enhance economic benefits		macroeconomic and institutional evidence	
H12: Sustainability	Integrated strategies mitigate the resource-price paradox and improve sustainability	Mixed-methods triangulation	Supported by integrated findings and the proposed feedback framework	Supported through synthesis

Table 6.1 summarises the outcomes of the twelve hypotheses examined in the study. For the ARDL model, six of the seven null hypotheses were rejected at the 5% significance level, while the null hypothesis relating to interest rates was not rejected. For the Phase Two analysis, the quantitative results did not provide sufficient statistical evidence to reject the null hypotheses relating to transparency, longevity and collaboration, although the qualitative findings provided additional contextual insights into these institutional dimensions. Hypotheses 11 and 12 were not tested through a separate statistical model but were assessed through mixed-methods triangulation and integration of the macroeconomic, stakeholder and qualitative findings. They are therefore reported as supported through synthesis rather than statistically accepted or rejected.

6.1.1 Economic Findings

The first major finding is that Zambia's copper value addition is tightly linked to macroeconomic stability. The ARDL analysis confirmed that GDP growth and copper export expansion significantly promote downstream investment, while exchange-rate depreciation, inflationary pressure and rising global copper prices suppress domestic value addition. These results demonstrate that Zambia's ability to upgrade its copper value chain depends on a predictable macroeconomic environment, a priority echoed in Vision 2030 and the 8NDP, which emphasise economic stability as a prerequisite for industrialisation (GRZ, 2022).

A long-run equilibrium relationship was established between copper value addition and macroeconomic variables, with the error-correction mechanism showing a relatively fast adjustment speed of 63%. This suggests that Zambia's copper mining sector is responsive to policy reforms when consistency and credibility are maintained. The findings underscore that macroeconomic stability particularly exchange-rate predictability, inflation control and prudent fiscal management is indispensable for sustaining Zambia's competitiveness in copper processing

and fabrication. Recent empirical studies on African industrialisation similarly stress that currency volatility and inflation spikes undermine profitability, deter reinvestment and disrupt value chains (IMF, 2025; EIB, 2024; AfDB, 2023). To mitigate these risks, Zambia should uphold disciplined monetary policy, reduce fiscal deficits, and strengthen coordination between the Bank of Zambia and the Ministry of Finance. A stable macroeconomic climate lowers the cost of imported machinery and inputs, making beneficiation more feasible.

Equally important is the strategic reinvestment of mineral revenues. As EITI (2023) and UNDP (2022) emphasise, resource rents should be channelled into long-term assets rather than recurrent expenditure. This includes investments in reliable energy systems, transport infrastructure, research and development, and technical skills relevant to metallurgy, engineering and manufacturing. These investments serve as foundational enablers of value-chain upgrading and ensure that copper revenues catalyse diversification rather than consumption.

To accelerate domestic value addition, industrial policy should provide targeted incentives such as tax rebates, concessional credit lines, and investment guarantees for firms operating in refining, wire and cable manufacturing, alloy production and component fabrication. These policy tools, widely used in emerging markets transitioning from extraction to processing, have been shown to attract long-term private capital (UNCTAD, 2023; World Bank, 2022). Ensuring reliable energy supply and efficient logistics infrastructure is equally critical. Partnerships between industry and academic institutions can also foster innovation, strengthening Zambia's technical and technological capabilities.

6.1.2 Governance and Stakeholder Findings

The second major finding relates to stakeholder engagement. The logistic regression and thematic analysis demonstrated that engagement effectiveness and perceived influence are the strongest predictors of governance satisfaction, while engagement frequency has diminishing or negative effects. Stakeholders respond positively to processes that are transparent, timely and outcome-oriented, and negatively to repetitive consultations that do not translate into action.

Differentiation in satisfaction across stakeholder groups revealed persistent power asymmetries: government and mining firms reported higher satisfaction, while communities expressed lower

satisfaction due to limited influence and inadequate follow-through. These findings echo Zambia's Extractive Industries Transparency Initiative (EITI, 2023) reports on engagement challenges within the mining sector.

6.1.3 Integrated Findings

The synthesis of findings shows that Zambia's copper sector operates within a dual dependency framework:

- **Economic dependency:** the sector relies on external copper demand and global price cycles.
- **Institutional dependency:** governance legitimacy rests on the quality of participation and transparency.

These two domains are mutually reinforcing. Macroeconomic reforms create opportunities for industrialisation, but their success depends on participatory governance that ensures equitable capture and distribution of benefits. Conversely, legitimate governance systems foster investor confidence and improve policy adherence, contributing to macroeconomic stability.

6.2 Conclusions

6.2.1 Economic Conclusions

The study concludes that Zambia has not yet translated its substantial mineral endowment into broad-based industrial transformation. The negative association between copper prices and value addition underscores the persistence of the resource-price paradox: high global prices tend to entrench extraction rather than beneficiation. Exchange-rate volatility, inflation and inconsistent fiscal reinvestment mechanisms continue to limit downstream industrialisation. The challenge is therefore not resource scarcity but inconsistent policy coherence and insufficient reinvestment of mineral rents into productive sector.

6.2.2 Institutional and Governance Conclusions

Institutionally, the study finds that Zambia's stakeholder engagement processes are procedurally abundant but substantively weak. Engagement often appears in policy documents and corporate

frameworks but does not consistently translate into shared decision-making power. Effective and influential engagement not the number of meetings drives legitimacy. Where influence is absent, stakeholders view governance as inequitable, resulting in mistrust, conflict and resistance.

6.2.3 Conclusions by Research Objective

Objective 1: Economic Factors and Copper Value Addition

The first objective examined the effect of economic factors on copper value addition in Zambia. The ARDL results established that economic conditions significantly shape the performance of the copper value chain. GDP, mineral rents, exchange rates and trade value margins had significant positive effects, while inflation and copper prices had significant negative effects. Interest rates were statistically insignificant. The negative copper price effect is particularly important because it demonstrates that favourable global prices do not automatically translate into increased domestic value addition. Overall, the findings show that Zambia's capacity to expand copper value addition depends not only on mineral availability but also on macroeconomic stability, productive reinvestment and the ability to convert mineral revenues into domestic industrial development.

Accordingly, the null hypotheses for H1 (GDP), H2 (Mineral Rent), H3 (Copper Price), H4 (Inflation Rate), H5 (Exchange Rate) and H7 (Trade Value Margins) were rejected because statistically significant effects were established. The null hypothesis for H6 (Interest Rate) was not rejected because the estimated effect was statistically insignificant. Objective 1 was therefore achieved, with six of the seven economic hypotheses receiving empirical support for significant relationships.

Objective 2: Stakeholder Engagement and Governance

The second objective examined the influence of stakeholder engagement on the administration, transparency, longevity and collaborative governance of Zambia's copper mining sector. The quantitative findings showed that Engagement Frequency, Engagement Effectiveness and Influence on Governance were not statistically significant predictors of governance satisfaction. The findings therefore indicate that the existence or frequency of engagement alone does not necessarily improve perceptions of governance.

The qualitative findings provided important context for these results. Stakeholders described engagement as widespread but often superficial, with concerns relating to transparency, accountability, limited influence and consultation fatigue. This suggests that the central institutional challenge is not simply whether stakeholders are consulted, but whether participation produces visible outcomes and meaningful influence over decisions. The findings therefore distinguish between the occurrence of engagement and the substantive quality of engagement.

On this basis, the quantitative evidence was insufficient to reject the null hypotheses for H8 (Stakeholder Engagement and Transparency), H9 (Stakeholder Engagement and Longevity) and H10 (Stakeholder Engagement and Collaboration). However, the qualitative findings provided deeper evidence that transparency, operational stability and collaboration remain important institutional concerns. Objective 2 was therefore achieved through the combined interpretation of the quantitative and qualitative evidence.

Objective 3: Strategies and the Integrated Framework

The third objective identified strategies and policy interventions for strengthening the economic and institutional sustainability of Zambia's copper value chain. The synthesis of the findings demonstrates that economic performance and institutional governance should not be treated as separate policy domains. Macroeconomic stability can support investment and value addition, but sustainable outcomes also depend on meaningful stakeholder participation, governance legitimacy, policy continuity and productive reinvestment.

The proposed Economic–Institutional Feedback Loop captures this interaction. The framework suggests that stable economic conditions can support investment in value addition, while effective stakeholder engagement and governance legitimacy can strengthen policy continuity and encourage reinvestment. Conversely, macroeconomic instability, weak stakeholder influence and low institutional trust can weaken the cycle. The framework is therefore presented as an integrated interpretation of the Phase One, Phase Two and qualitative findings rather than as a fully estimated causal model.

The evidence supporting H11 (Inclusive Participation and Economic Benefits) and H12 (Inclusive Participation and Sustainability) was assessed through mixed-methods triangulation rather than a

separate statistical model. The integrated findings support the proposition that stronger coordination between fiscal-industrial policy and stakeholder co-governance can improve the conditions for economic benefits and sustainability. H11 and H12 are therefore concluded as supported through synthesis, rather than statistically accepted or rejected. Objective 3 was consequently achieved through the development of an integrated framework and evidence-based policy strategies.

6.2.4 Integrated Conclusions

The overarching conclusion is that Zambia's copper-driven development cannot be achieved without synchronising macroeconomic and institutional reforms. Economic reforms should be complemented by governance structures that promote participation, accountability and transparency. This dual-track framework anchoring stability on one track and influence-based legitimacy on the other provides a viable pathway for transforming Zambia from a raw-export economy into an industrialised and inclusive copper producer.

The integration of the two empirical phases reveals an important asymmetry between economic adjustment and institutional responsiveness. The error-correction coefficient of -0.63 indicates that approximately 63% of macroeconomic disequilibrium in copper value addition is corrected within one year. In contrast, the marginal effect of perceived Influence on Governance is only 0.010 and statistically insignificant ($p = 0.648$), indicating that greater perceived influence is associated with only a small change in governance satisfaction. These findings do not establish a direct causal relationship between macroeconomic adjustment and institutional legitimacy because the two models were estimated separately. However, their integration suggests that Zambia's copper sector may adjust to economic shocks more rapidly than its governance structures translate stakeholder participation into meaningful influence. The empirical bridge therefore lies in this contrast: economic correction can occur relatively quickly, while institutional responsiveness remains weak. Sustainable value addition may consequently require not only macroeconomic adjustment but also stronger mechanisms through which stakeholder influence contributes to governance and policy continuity.

6.3 Policy Recommendations

Based on the study's findings, the following policy recommendations are advanced. The policy recommendations are primarily derived from the variables examined in the empirical analysis. The significant effects of GDP, inflation, exchange rates, mineral rents, copper prices and trade value margins provide the basis for recommendations on macroeconomic stability, productive reinvestment of mineral revenues, management of commodity-price exposure and strengthening domestic value-chain competitiveness. Where specific instruments such as tax incentives or concessional finance are proposed, these are presented as possible implementation mechanisms rather than as policies directly tested by the econometric model. This distinction ensures that the recommendations remain grounded in the empirical findings while allowing the study to translate those findings into practical policy options.

6.3.1 Economic Policy Recommendations

Zambia should prioritise macroeconomic stability as the foundation for industrialisation. This includes stabilising the exchange rate, reducing inflation and maintaining prudent fiscal policy objectives consistent with the 8NDP and Vision 2030. Improved coordination between the Bank of Zambia and the Ministry of Finance is necessary to ensure predictable investment conditions.

Strategic reinvestment of mineral rents is essential. Rather than financing recurrent spending, copper revenues should be directed toward energy reliability, transport infrastructure, technology acquisition and human-capital development. These investments enable copper refining, alloy production and electrical component manufacturing, core areas highlighted in Zambia's Mineral Resources Development Policy (2022). The Government of Zambia should establish a legally mandated mineral-revenue reinvestment framework that ring-fences a defined share of mineral revenues for domestic copper value addition. The ring-fenced resources should finance priority areas such as refining and fabrication capacity, local supplier development, industrial infrastructure, skills development and technology upgrading. Implementation should be coordinated through a National Copper Value Chain Council comprising government, mining companies, local manufacturers, research institutions, labour representatives and mining communities. The Council should publish annual targets and reports on revenue allocation,

domestic processing, local procurement and value-chain investment to strengthen accountability and policy continuity.

The implementation of the proposed National Copper Value Chain Council would require careful consideration of institutional costs, political coordination and the risk of duplicating existing government functions. To minimise these challenges, the Council should operate as a lean coordinating mechanism linked to existing institutions rather than as a large new bureaucracy. Its potential benefits include improved coordination across the copper value chain, clearer accountability for mineral-revenue reinvestment and stronger alignment between government, industry and stakeholder priorities. These benefits should, however, be weighed against administrative costs, possible institutional overlap and the need for sustained political commitment. A phased implementation approach, beginning with a small technical secretariat and clearly defined performance indicators, would therefore improve feasibility and reduce unnecessary institutional costs.

Industrial policy should offer targeted incentives such as tax relief, concessional financing and research grants to domestic firms engaging in value addition. Collaborative innovation partnerships between mining companies, universities and technical institutes would strengthen Zambia's technological capacity.

6.3.2 Governance and Institutional Recommendations

To enhance governance legitimacy, stakeholder participation should shift from symbolic consultation to genuine shared decision-making. Statutory frameworks should require mining firms and government entities to incorporate stakeholder inputs into policy and project design, with publicly disclosed records of implementation and follow-up.

The strategies proposed under Objective 3 are directly informed by the empirical findings. The significant negative copper price coefficient ($\beta = -0.3465$, $p = 0.0095$) suggests that higher copper prices do not automatically translate into greater domestic value addition. This finding supports the introduction of a reinvestment rule requiring a defined proportion of additional revenues generated during periods of high copper prices to be directed towards domestic processing, refining, productive capacity and economic stabilisation. Similarly, the negative effect of inflation

($\beta = -0.2784$, $p = 0.0073$) highlights the importance of macroeconomic stability, while the positive effects of GDP, mineral rents and trade value margins support policies that strengthen domestic productive capacity, improve the productive use of mining revenues and expand value-chain competitiveness. These interventions are further reinforced by the stakeholder findings, which emphasise the need for meaningful participation, transparency and accountability in the implementation of mining-sector policies.

Engagement processes should be consolidated and streamlined into multi-sectoral stakeholder councils with clear mandates, avoiding consultation fatigue and ensuring efficiency. Zambia's commitment to EITI standards should extend to real-time disclosure of revenues, tax payments and community-development spending to strengthen public oversight.

Power asymmetries should be addressed by equipping civil-society and community representatives with structured channels for grievance resolution and policy escalation. Establishing a National Copper Value Chain Council bringing together government, industry, regulators, labour and civil society would enhance inter-agency coordination and policy coherence.

6.4 Contributions to Knowledge

This study makes several substantive contributions to both academic scholarship and practical policy discourse on resource governance and economic transformation. At the theoretical level, it achieves a significant integration of economic and governance theories by empirically demonstrating that macroeconomic stability and institutional legitimacy function as interdependent determinants of sustainable, resource-based development. This synthesis transcends the traditional divide between economic models of growth and political theories of governance, showing that neither can effectively explain developmental outcomes in isolation.

The research also advances the refinement of the resource-curse theory by moving beyond its deterministic interpretation. Rather than viewing natural resource wealth as inherently detrimental to economic performance, the study argues that the curse is conditional, resource abundance becomes a driver of development only when it is managed through transparent, credible, and accountable governance structures. This insight repositions governance quality as the mediating factor that determines whether mineral wealth translates into long-term prosperity or entrenched

dependency. The methodological contribution of the study lies in complementing, rather than replacing, qualitative approaches to legitimacy and Social Licence to Operate. By operationalising governance satisfaction as a binary measurable outcome, the study provides a systematic means of examining how dimensions of stakeholder engagement are associated with institutional legitimacy. This approach allows policymakers to monitor changes in governance perceptions over time, compare stakeholder groups and identify areas where engagement mechanisms may require improvement. Unlike purely qualitative approaches, the model also provides estimated probabilities and marginal effects that indicate the direction and magnitude of changes associated with engagement variables. However, given the modest predictive performance of the model and the statistical insignificance of the individual predictors, its current contribution is primarily explanatory and diagnostic rather than a definitive forecasting tool.

The findings refine the conventional resource-curse argument by challenging the assumption that mineral dependence produces adverse development outcomes through an automatic or inevitable process. In the Zambian case, the significant effects of GDP, inflation, exchange rates, mineral rents, copper prices and trade value margins show that the development outcomes associated with copper depend on how external shocks and mineral revenues are transmitted through the domestic economy. The negative copper-price coefficient ($\beta = -0.3465$) is particularly important because it suggests that favourable commodity prices do not automatically translate into greater domestic value addition. At the same time, the stakeholder findings indicate that frequent participation without meaningful influence does not necessarily strengthen governance satisfaction. The study therefore positions the resource curse as a conditional institutional outcome: mineral wealth creates opportunities and vulnerabilities, but the extent to which these translate into value addition depends on policy choices concerning revenue reinvestment, macroeconomic stability, stakeholder influence and governance accountability. In this sense, Zambia's challenge is not mineral wealth itself, but the institutional capacity to convert mineral rents and favourable market conditions into sustained domestic transformation.

Equally, the study contributes to the empirical extension of legitimacy theory by operationalising abstract governance concepts such as stakeholder influence, engagement effectiveness, and perceived fairness within a quantitative framework. By linking these constructs to measurable outcomes through econometric and logistic models, the research grounds legitimacy theory in

empirical evidence and demonstrates its explanatory power within the field of governance economics.

A further contribution is the development of a conceptual model of dual-track development, which posits that economic stability and participatory legitimacy should evolve in tandem for resource-dependent economies to achieve sustained and inclusive growth. This dual framework offers a new analytical lens for evaluating the success of policy interventions in African mineral economies, highlighting the need to balance fiscal discipline with participatory governance.

Finally, the study offers contextual insights specific to Zambia, providing evidence-based guidance for policymakers, regulators, and industry leaders navigating the challenges of economic diversification and institutional reform. By situating its findings within Zambia's unique macroeconomic and governance landscape, the study delivers actionable recommendations for enhancing copper value addition, stabilising fiscal outcomes, and institutionalising meaningful stakeholder participation. Collectively, these contributions extend theoretical understanding, enrich empirical knowledge, and provide a practical blueprint for managing resource wealth in ways that promote equitable and sustainable national development.

6.5 Limitations of the Study

While the study offers a comprehensive analysis of the relationship between economic factors, the copper value addition, and stakeholder engagement in Zambia, several limitations should be acknowledged to contextualise its findings and guide future research.

First, data constraints presented certain challenges. Historical data on copper beneficiation, value-addition activities, and stakeholder engagement indicators were limited in both consistency and scope, particularly for earlier decades. Variations in data collection standards across institutions occasionally necessitated interpolation and secondary validation, which, while carefully managed, may have introduced minor measurement bias.

Second, the cross-sectional design employed for the governance component limits the ability to make definitive causal inferences regarding changes in stakeholder perceptions over time. The survey captured stakeholder experiences and attitudes at a single point, reflecting conditions

specific to that period. A longitudinal design, tracking the same stakeholders or institutions across multiple years would provide stronger evidence of how engagement practices and governance satisfaction evolve in response to policy reforms or market fluctuations.

Third, the generalisability of the model is subject to contextual limitations. While the findings are robust within the Zambian setting, institutional arrangements, political economies, and mining sector structures vary considerably across countries. Therefore, applying the model to other contexts would require careful adaptation to local governance systems and macroeconomic conditions to maintain analytical validity.

Lastly, the study period coincided with major external shocks, including the 2008 global financial crisis and the COVID-19 pandemic. These global disruptions likely affected copper prices, investment flows, and fiscal stability, factors beyond domestic policy control that may have influenced the economic indicators under analysis.

Despite these limitations, the methodological rigor applied through robustness checks, triangulation of data sources, and model validation ensures that the study's findings remain credible and meaningful. Rather than undermining the results, these constraints highlight areas for further inquiry, particularly the need for longitudinal data, cross-country comparative studies, and deeper exploration of post-pandemic recovery dynamics in Zambia's resource governance framework.

6.6 Areas for Further Research

Building on the foundations laid by this study, future research could extend and deepen understanding of the intricate linkages between economic management, stakeholder engagement, and resource governance in several key directions.

First, a longitudinal analysis of governance dynamics would be valuable. Repeating the stakeholder survey at regular intervals could capture how perceptions of engagement, transparency, and legitimacy evolve as policy and institutional reforms take root. Such a design would allow researchers to assess whether improvements in governance processes translate into measurable shifts in trust, participation, and satisfaction over time, thereby strengthening causal

inference. Furthermore, future research should undertake a five-year panel study of mining and copper-processing firms in Zambia, collecting annual data on investment in processing capacity, technology, research and development, local procurement and employment. These firm-level data should be linked to repeated measures of stakeholder engagement, perceived influence, governance satisfaction and community outcomes in the same mining areas. Such a design would allow future studies to examine how changes in investment and value addition are associated with changes in stakeholder perceptions over time, thereby providing a stronger empirical bridge between the macroeconomic and institutional dimensions identified in this study.

Second, comparative studies involving other copper-producing economies such as Chile, Peru, and the Democratic Republic of Congo would provide an international benchmark for Zambia's experience. Comparative cross-country analyses could reveal how differing institutional arrangements, fiscal policies, and governance frameworks influence value addition and stakeholder outcomes, offering transferable lessons for regional policy harmonisation in the extractive sector. In addition, future research should apply a behavioural economics approach to examine the possible participation paradox identified in this study. A longitudinal or experimental design could investigate whether a measurable threshold exists at which repeated stakeholder consultation begins to generate fatigue and declining satisfaction. Such research should examine consultation frequency alongside perceived influence, visible policy outcomes, participation costs and institutional trust. This would help determine whether dissatisfaction arises from the frequency of engagement itself or from repeated consultation that produces limited meaningful outcomes.

Third, micro-level value-chain studies are recommended to complement this study's macroeconomic and institutional focus. Firm-level analyses could explore how individual mining companies integrate local suppliers, adopt technological innovations, and contribute to domestic value addition. Such studies would provide granular insights into corporate behaviour, local content development, and the operational challenges of industrial upgrading.

Fourth, future work should investigate gender and inclusion in resource governance. Examining how gender dynamics, community representation, and social hierarchies shape engagement effectiveness would expand the inclusivity dimension of extractive governance research. This

focus would align with global efforts to make natural resource management more equitable and socially responsive.

Fifth, Future research should examine the development of a more consistent national statistical and reporting framework for mineral beneficiation and copper value addition in Zambia. This study was constrained by inconsistencies in historical data definitions, coverage and reporting across different sources. Future studies should therefore explore standardised indicators for tracking copper processing, refining, fabrication, domestic value addition and reinvestment over time. Improved coordination among relevant government and statistical institutions would support the development of consistent longitudinal datasets and strengthen future econometric analysis of Zambia's mineral value chain.

Finally, the impact of the global green energy transition presents a critical area for future inquiry. As the demand for copper intensifies due to its essential role in renewable energy technologies and electric mobility, Zambia faces both opportunities and risks. Future research should assess how the country can strategically position itself within low-carbon industrial value chains, ensuring that environmental imperatives align with economic diversification and social development goals.

Collectively, these proposed directions offer a pathway for evolving the discourse on sustainable resource governance shifting it from static analysis to dynamic, forward-looking research that reflects both local realities and global transformations.

Publications Arising from this Thesis

The following publications have emerged from the research presented in this thesis:

1. Chisanga, B., Phiri, J., & Osabuohien, E. (2025). Macroeconomic factors and natural resource management in Africa: Evidence from copper value addition in Zambia. *Discover Sustainability*, 6 (61). <https://doi.org/10.1007/s43621-024-00531-9> (Springer Nature). This article is based on empirical analysis and findings drawn directly from the data and discussion presented in Chapters 4, 5 and 6 of the thesis.
2. Chisanga, B., Phiri, J., & Osabuohien, E. (2026). Stakeholder Engagement and Governance in Zambia's Copper Mining Sector. *Cogent Social Sciences*, 12 (1).

<https://doi.org/10.1080/23311886.2026.2682578> (Taylor & Francis). This peer-reviewed journal article is derived from the stakeholder analysis, governance frameworks, and thematic analysis discussed in Chapters 4, 5 and 6 of the thesis.

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APPENDICES

APPENDIX A: ORIGINAL UNIT ROOT ESTIMATION OUTPUTS

Null Hypothesis: D(LCVA) has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-5.812734	0.0000
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	4.325497
HAC corrected variance (Bartlett kernel)	3.976469

Phillips-Perron Test Equation

Dependent Variable: D(LCVA,2)

Method: Least Squares

Date: 04/09/24 Time: 19:20

Sample (adjusted): 1983 2021

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCVA(-1))	-1.305663	0.220858	-5.911771	0.0000
C	-0.091510	0.343712	-0.266241	0.7915
R-squared	0.485747	Mean dependent var	-0.299088	
Adjusted R-squared	0.471848	S.D. dependent var	2.938124	
S.E. of regression	2.135254	Akaike info criterion	4.404968	
Sum squared resid	168.6944	Schwarz criterion	4.490279	
Log likelihood	-83.89688	Hannan-Quinn criter.	4.435577	
F-statistic	34.94904	Durbin-Watson stat	1.522593	
Prob(F-statistic)	0.000001			

Null Hypothesis: LGDP has a unit root

Exogenous: Constant

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-0.202150	0.9299

Test critical values:	1% level	-3.605593
	5% level	-2.936942
	10% level	-2.606857

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.034929
HAC corrected variance (Bartlett kernel)	0.034929

Phillips-Perron Test Equation
 Dependent Variable: D(LGDP)
 Method: Least Squares
 Date: 04/09/24 Time: 19:21
 Sample (adjusted): 1982 2021
 Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.006854	0.033904	-0.202150	0.8409
C	0.198011	0.768947	0.257509	0.7982
R-squared	0.001074	Mean dependent var		0.042689
Adjusted R-squared	-0.025213	S.D. dependent var		0.189376
S.E. of regression	0.191748	Akaike info criterion		-0.416559
Sum squared resid	1.397163	Schwarz criterion		-0.332115
Log likelihood	10.33117	Hannan-Quinn criter.		-0.386026
F-statistic	0.040865	Durbin-Watson stat		1.429657
Prob(F-statistic)	0.840878			

Null Hypothesis: LGDP has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.390334	0.3788
Test critical values:	1% level	-4.205004
	5% level	-3.526609
	10% level	-3.194611

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.030066
HAC corrected variance (Bartlett kernel)	0.038610

Phillips-Perron Test Equation
 Dependent Variable: D(LGDP)
 Method: Least Squares
 Date: 04/09/24 Time: 19:21

Sample (adjusted): 1982 2021
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.171201	0.074361	-2.302285	0.0270
C	3.633633	1.579588	2.300368	0.0272
@TREND("1981")	0.014092	0.005761	2.446302	0.0193
R-squared	0.140147	Mean dependent var		0.042689
Adjusted R-squared	0.093669	S.D. dependent var		0.189376
S.E. of regression	0.180289	Akaike info criterion		-0.516478
Sum squared resid	1.202647	Schwarz criterion		-0.389812
Log likelihood	13.32955	Hannan-Quinn criter.		-0.470679
F-statistic	3.015308	Durbin-Watson stat		1.421091
Prob(F-statistic)	0.061213			

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-4.410625	0.0011
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.033034
HAC corrected variance (Bartlett kernel)	0.026356

Phillips-Perron Test Equation
Dependent Variable: D(LGDP,2)
Method: Least Squares
Date: 04/09/24 Time: 19:22
Sample (adjusted): 1983 2021
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	-0.724578	0.159213	-4.550985	0.0001
C	0.034016	0.030508	1.114976	0.2721
R-squared	0.358880	Mean dependent var		0.005987
Adjusted R-squared	0.341552	S.D. dependent var		0.229961
S.E. of regression	0.186601	Akaike info criterion		-0.469763
Sum squared resid	1.288343	Schwarz criterion		-0.384453
Log likelihood	11.16039	Hannan-Quinn criter.		-0.439155
F-statistic	20.71147	Durbin-Watson stat		1.889511
Prob(F-statistic)	0.000056			

Null Hypothesis: LMINERAL_RENT___OF_GDP has a unit root

Exogenous: Constant

Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.356713	0.1602
Test critical values:		
1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	3.908698
HAC corrected variance (Bartlett kernel)	3.107741

Phillips-Perron Test Equation

Dependent Variable: D(LMINERAL_RENT___OF_GDP)

Method: Least Squares

Date: 04/09/24 Time: 19:22

Sample (adjusted): 1982 2021

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMINERAL_RENT___OF_GDP(-1)	-0.308356	0.119563	-2.579024	0.0139
C	-0.017035	0.328847	-0.051802	0.9590
R-squared	0.148962	Mean dependent var		0.170363
Adjusted R-squared	0.126566	S.D. dependent var		2.170398
S.E. of regression	2.028403	Akaike info criterion		4.301081
Sum squared resid	156.3479	Schwarz criterion		4.385525
Log likelihood	-84.02163	Hannan-Quinn criter.		4.331614
F-statistic	6.651363	Durbin-Watson stat		2.333723
Prob(F-statistic)	0.013904			

Null Hypothesis: LMINERAL_RENT___OF_GDP has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.765605	0.0291
Test critical values:		
1% level	-4.205004	
5% level	-3.526609	
10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	3.319242
HAC corrected variance (Bartlett kernel)	3.319242

Phillips-Perron Test Equation
Dependent Variable: D(LMINERAL_RENT___OF_GDP)
Method: Least Squares
Date: 04/09/24 Time: 19:23
Sample (adjusted): 1982 2021
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMINERAL_RENT___OF_GDP(-1)	-0.555952	0.147640	-3.765605	0.0006
C	-1.970344	0.821573	-2.398258	0.0216
@TREND("1981")	0.087943	0.034308	2.563345	0.0146
R-squared	0.277304	Mean dependent var		0.170363
Adjusted R-squared	0.238239	S.D. dependent var		2.170398
S.E. of regression	1.894299	Akaike info criterion		4.187614
Sum squared resid	132.7697	Schwarz criterion		4.314280
Log likelihood	-80.75227	Hannan-Quinn criter.		4.233412
F-statistic	7.098589	Durbin-Watson stat		2.096146
Prob(F-statistic)	0.002459			

Null Hypothesis: D(LMINERAL_RENT___OF_GDP) has a unit root
Exogenous: Constant
Bandwidth: 15 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-13.99802	0.0000
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	3.910659
HAC corrected variance (Bartlett kernel)	1.006051

Phillips-Perron Test Equation
Dependent Variable: D(LMINERAL_RENT___OF_GDP,2)
Method: Least Squares
Date: 04/09/24 Time: 19:24
Sample (adjusted): 1983 2021
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMINERAL_RENT___OF_GDP(-1))	-1.385412	0.150266	-9.219724	0.0000

C	0.276661	0.325816	0.849134	0.4013
R-squared	0.696730	Mean dependent var	0.078429	
Adjusted R-squared	0.688533	S.D. dependent var	3.637897	
S.E. of regression	2.030282	Akaike info criterion	4.304147	
Sum squared resid	152.5157	Schwarz criterion	4.389458	
Log likelihood	-81.93087	Hannan-Quinn criter.	4.334756	
F-statistic	85.00331	Durbin-Watson stat	1.924415	
Prob(F-statistic)	0.000000			

Null Hypothesis: LPRICE_PER_POUND has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-0.693013	0.8370
Test critical values:		
1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.044532
HAC corrected variance (Bartlett kernel)	0.052440

Phillips-Perron Test Equation
Dependent Variable: D(LPRICE_PER_POUND)
Method: Least Squares
Date: 04/09/24 Time: 19:24
Sample (adjusted): 1982 2021
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPRICE_PER_POUND(-1)	-0.030794	0.054742	-0.562529	0.5771
C	0.052225	0.038983	1.339696	0.1883
R-squared	0.008259	Mean dependent var	0.041735	
Adjusted R-squared	-0.017840	S.D. dependent var	0.214603	
S.E. of regression	0.216508	Akaike info criterion	-0.173668	
Sum squared resid	1.781283	Schwarz criterion	-0.089224	
Log likelihood	5.473368	Hannan-Quinn criter.	-0.143136	
F-statistic	0.316438	Durbin-Watson stat	1.524471	
Prob(F-statistic)	0.577060			

Null Hypothesis: LPRICE_PER_POUND has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.241188	0.4549
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.039870
HAC corrected variance (Bartlett kernel)	0.049335

Phillips-Perron Test Equation

Dependent Variable: D(LPRICE_PER_POUND)

Method: Least Squares

Date: 04/09/24 Time: 19:25

Sample (adjusted): 1982 2021

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPRICE_PER_POUND(-1)	-0.195878	0.095153	-2.058549	0.0466
C	-0.111350	0.087071	-1.278837	0.2089
@TREND("1981")	0.010722	0.005155	2.080074	0.0445
R-squared	0.112089	Mean dependent var		0.041735
Adjusted R-squared	0.064094	S.D. dependent var		0.214603
S.E. of regression	0.207611	Akaike info criterion		-0.234259
Sum squared resid	1.594791	Schwarz criterion		-0.107593
Log likelihood	7.685188	Hannan-Quinn criter.		-0.188461
F-statistic	2.335424	Durbin-Watson stat		1.458969
Prob(F-statistic)	0.110875			

Null Hypothesis: D(LPRICE_PER_POUND) has a unit root

Exogenous: Constant

Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.825368	0.0003
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.043286
HAC corrected variance (Bartlett kernel)	0.038000

Phillips-Perron Test Equation
Dependent Variable: D(LPRICE_PER_POUND,2)
Method: Least Squares
Date: 04/09/24 Time: 19:25
Sample (adjusted): 1983 2021
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LPRICE_PER_POUND(-1))	-0.815206	0.166148	-4.906511	0.0000
C	0.041541	0.034618	1.199963	0.2378
R-squared	0.394176	Mean dependent var		0.015332
Adjusted R-squared	0.377802	S.D. dependent var		0.270795
S.E. of regression	0.213602	Akaike info criterion		-0.199486
Sum squared resid	1.688152	Schwarz criterion		-0.114175
Log likelihood	5.889977	Hannan-Quinn criter.		-0.168877
F-statistic	24.07385	Durbin-Watson stat		1.883344
Prob(F-statistic)	0.000019			

Null Hypothesis: LTRADE_VALUE_MARGINS has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.195361	0.2111
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.585566
HAC corrected variance (Bartlett kernel)	0.578195

Phillips-Perron Test Equation
Dependent Variable: D(LTRADE_VALUE_MARGINS)
Method: Least Squares
Date: 04/09/24 Time: 19:26
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTRADE_VALUE_MARGINS(-1)	-0.104792	0.047786	-2.192925	0.0347
C	2.254260	0.947807	2.378396	0.0227
R-squared	0.115021	Mean dependent var		0.194181
Adjusted R-squared	0.091103	S.D. dependent var		0.824066
S.E. of regression	0.785632	Akaike info criterion		2.405265
Sum squared resid	22.83708	Schwarz criterion		2.490576

Log likelihood	-44.90266	Hannan-Quinn criter.	2.435874
F-statistic	4.808920	Durbin-Watson stat	1.853403
Prob(F-statistic)	0.034676		

Null Hypothesis: LTRADE_VALUE_MARGINS has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.829058	0.6713
Test critical values:		
1% level	-4.211868	
5% level	-3.529758	
10% level	-3.196411	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.579328
HAC corrected variance (Bartlett kernel)	0.641331

Phillips-Perron Test Equation
Dependent Variable: D(LTRADE_VALUE_MARGINS)
Method: Least Squares
Date: 04/09/24 Time: 19:27
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTRADE_VALUE_MARGINS(-1)	-0.147741	0.084149	-1.755720	0.0876
C	2.853500	1.356418	2.103703	0.0425
@TREND("1981")	0.012255	0.019683	0.622584	0.5375
R-squared	0.124448	Mean dependent var		0.194181
Adjusted R-squared	0.075807	S.D. dependent var		0.824066
S.E. of regression	0.792216	Akaike info criterion		2.445837
Sum squared resid	22.59381	Schwarz criterion		2.573804
Log likelihood	-44.69383	Hannan-Quinn criter.		2.491751
F-statistic	2.558470	Durbin-Watson stat		1.796032
Prob(F-statistic)	0.091426			

Null Hypothesis: D(LTRADE_VALUE_MARGINS) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-5.530686	0.0000
Test critical values:		
1% level	-3.615588	
5% level	-2.941145	

10% level

-2.609066

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.668794
HAC corrected variance (Bartlett kernel)	0.680581

Phillips-Perron Test Equation

Dependent Variable: D(LTRADE_VALUE_MARGINS,2)

Method: Least Squares

Date: 04/09/24 Time: 19:27

Sample (adjusted): 1983 2020

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LTRADE_VALUE_MARGINS(-1))	-0.915956	0.165778	-5.525179	0.0000
C	0.166718	0.139717	1.193257	0.2406
R-squared	0.458871	Mean dependent var	-0.002970	
Adjusted R-squared	0.443840	S.D. dependent var	1.126645	
S.E. of regression	0.840208	Akaike info criterion	2.540862	
Sum squared resid	25.41419	Schwarz criterion	2.627050	
Log likelihood	-46.27637	Hannan-Quinn criter.	2.571527	
F-statistic	30.52760	Durbin-Watson stat	1.929314	
Prob(F-statistic)	0.000003			

Null Hypothesis: EXCHANGE_RATE is stationary

Exogenous: Constant

Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic	0.269955
Asymptotic critical values*:	
1% level	0.739000
5% level	0.463000
10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	25118.46
HAC corrected variance (Bartlett kernel)	24754.01

KPSS Test Equation

Dependent Variable: EXCHANGE_RATE

Method: Least Squares

Date: 04/09/24 Time: 19:29

Sample: 1981 2021

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	29.05561	25.05916	1.159481	0.2531
R-squared	0.000000	Mean dependent var		29.05561
Adjusted R-squared	0.000000	S.D. dependent var		160.4569
S.E. of regression	160.4569	Akaike info criterion		13.01802
Sum squared resid	1029857.	Schwarz criterion		13.05981
Log likelihood	-265.8693	Hannan-Quinn criter.		13.03324
Durbin-Watson stat	2.028159			

Null Hypothesis: EXCHANGE_RATE is stationary

Exogenous: Constant, Linear Trend

Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

	LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic	0.085836
Asymptotic critical values*:	
1% level	0.216000
5% level	0.146000
10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	23855.60
HAC corrected variance (Bartlett kernel)	14962.84

KPSS Test Equation

Dependent Variable: EXCHANGE_RATE

Method: Least Squares

Date: 04/09/24 Time: 19:37

Sample: 1981 2021

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-31.01251	48.57309	-0.638471	0.5269
@TREND("1981")	3.003406	2.090253	1.436862	0.1587
R-squared	0.050276	Mean dependent var		29.05561
Adjusted R-squared	0.025924	S.D. dependent var		160.4569
S.E. of regression	158.3634	Akaike info criterion		13.01521
Sum squared resid	978079.5	Schwarz criterion		13.09880
Log likelihood	-264.8119	Hannan-Quinn criter.		13.04565
F-statistic	2.064574	Durbin-Watson stat		2.135776
Prob(F-statistic)	0.158732			

Null Hypothesis: D(EXCHANGE_RATE) is stationary

Exogenous: Constant
Bandwidth: 39 (Newey-West automatic) using Bartlett kernel

	LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic	0.500000
Asymptotic critical values*:	
1% level	0.739000
5% level	0.463000
10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	52217.61
HAC corrected variance (Bartlett kernel)	1286.128

KPSS Test Equation
Dependent Variable: D(EXCHANGE_RATE)
Method: Least Squares
Date: 04/09/24 Time: 19:37
Sample (adjusted): 1982 2021
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.482250	36.59116	0.013179	0.9896
R-squared	0.000000	Mean dependent var		0.482250
Adjusted R-squared	0.000000	S.D. dependent var		231.4228
S.E. of regression	231.4228	Akaike info criterion		13.75105
Sum squared resid	2088704.	Schwarz criterion		13.79327
Log likelihood	-274.0210	Hannan-Quinn criter.		13.76632
Durbin-Watson stat	2.998452			

Null Hypothesis: INFLATION_RATE is stationary
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

	LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic	0.289345
Asymptotic critical values*:	
1% level	0.739000
5% level	0.463000
10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	1745.787
HAC corrected variance (Bartlett kernel)	6742.474

KPSS Test Equation
 Dependent Variable: INFLATION_RATE
 Method: Least Squares
 Date: 04/09/24 Time: 19:38
 Sample: 1981 2021
 Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	33.87195	6.606411	5.127133	0.0000
R-squared	0.000000	Mean dependent var		33.87195
Adjusted R-squared	0.000000	S.D. dependent var		42.30167
S.E. of regression	42.30167	Akaike info criterion		10.35162
Sum squared resid	71577.26	Schwarz criterion		10.39341
Log likelihood	-211.2082	Hannan-Quinn criter.		10.36684
Durbin-Watson stat	0.431948			

Null Hypothesis: D(INFLATION_RATE) is stationary
 Exogenous: Constant
 Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

	LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic	0.104213
Asymptotic critical values*:	
1% level	0.739000
5% level	0.463000
10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	772.8607
HAC corrected variance (Bartlett kernel)	535.9962

KPSS Test Equation
 Dependent Variable: D(INFLATION_RATE)
 Method: Least Squares
 Date: 04/09/24 Time: 19:38
 Sample (adjusted): 1982 2021
 Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.284250	4.451622	0.063853	0.9494
R-squared	0.000000	Mean dependent var		0.284250
Adjusted R-squared	0.000000	S.D. dependent var		28.15453
S.E. of regression	28.15453	Akaike info criterion		9.537976
Sum squared resid	30914.43	Schwarz criterion		9.580198
Log likelihood	-189.7595	Hannan-Quinn criter.		9.553242
Durbin-Watson stat	2.052571			

Null Hypothesis: LCOPPER_EXPORTS__B_ has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rothenberg-Stock DF-GLS test statistic	-0.913378
Test critical values: 1% level	-2.624057
5% level	-1.949319
10% level	-1.611711

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals
 Dependent Variable: D(GLSRESID)
 Method: Least Squares
 Date: 04/09/24 Time: 19:39
 Sample (adjusted): 1982 2021
 Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.052007	0.056940	-0.913378	0.3667
R-squared	-0.018453	Mean dependent var		0.171641
Adjusted R-squared	-0.018453	S.D. dependent var		0.866553
S.E. of regression	0.874511	Akaike info criterion		2.594379
Sum squared resid	29.82604	Schwarz criterion		2.636601
Log likelihood	-50.88759	Hannan-Quinn criter.		2.609646
Durbin-Watson stat	2.403523			

Null Hypothesis: LCOPPER_EXPORTS__B_ has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rothenberg-Stock DF-GLS test statistic	-3.483190
Test critical values: 1% level	-3.770000
5% level	-3.190000
10% level	-2.890000

*Elliott-Rothenberg-Stock (1996, Table 1)

Warning: Test critical values calculated for 50 observations
 and may not be accurate for a sample size of 40

DF-GLS Test Equation on GLS Detrended Residuals
 Dependent Variable: D(GLSRESID)
 Method: Least Squares
 Date: 04/09/24 Time: 19:40
 Sample (adjusted): 1982 2021

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.461802	0.132580	-3.483190	0.0012
R-squared	0.237166	Mean dependent var		0.010359
Adjusted R-squared	0.237166	S.D. dependent var		0.866553
S.E. of regression	0.756851	Akaike info criterion		2.305380
Sum squared resid	22.34009	Schwarz criterion		2.347602
Log likelihood	-45.10761	Hannan-Quinn criter.		2.320647
Durbin-Watson stat	2.073650			

Null Hypothesis: D(LCOPPER_EXPORTS__B_) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rootenber-Stock DF-GLS test statistic	-3.811055
Test critical values:	
1% level	-2.627238
5% level	-1.949856
10% level	-1.611469

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals

Dependent Variable: D(GLSRESID)

Method: Least Squares

Date: 04/09/24 Time: 19:40

Sample (adjusted): 1984 2021

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.701621	0.184102	-3.811055	0.0005
D(GLSRESID(-1))	-0.259096	0.126696	-2.045014	0.0482
R-squared	0.633227	Mean dependent var		-0.079792
Adjusted R-squared	0.623039	S.D. dependent var		1.240590
S.E. of regression	0.761687	Akaike info criterion		2.344635
Sum squared resid	20.88604	Schwarz criterion		2.430824
Log likelihood	-42.54807	Hannan-Quinn criter.		2.375300
Durbin-Watson stat	2.100993			

Null Hypothesis: LCVA has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rootenber-Stock DF-GLS test statistic	-1.801105

Test critical values:	1% level	-2.624057
	5% level	-1.949319
	10% level	-1.611711

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals

Dependent Variable: D(GLSRESID)

Method: Least Squares

Date: 04/09/24 Time: 19:41

Sample (adjusted): 1982 2021

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.177163	0.098363	-1.801105	0.0794
R-squared	0.075483	Mean dependent var		-0.080533
Adjusted R-squared	0.075483	S.D. dependent var		2.165958
S.E. of regression	2.082608	Akaike info criterion		4.329801
Sum squared resid	169.1530	Schwarz criterion		4.372023
Log likelihood	-85.59603	Hannan-Quinn criter.		4.345067
Durbin-Watson stat	1.717925			

Null Hypothesis: LCVA has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rootenber-Stock DF-GLS test statistic	-2.212861
Test critical values:	
1% level	-3.770000
5% level	-3.190000
10% level	-2.890000

*Elliott-Rootenber-Stock (1996, Table 1)

Warning: Test critical values calculated for 50 observations
and may not be accurate for a sample size of 40

DF-GLS Test Equation on GLS Detrended Residuals

Dependent Variable: D(GLSRESID)

Method: Least Squares

Date: 04/09/24 Time: 19:41

Sample (adjusted): 1982 2021

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.366536	0.165639	-2.212861	0.0328
R-squared	0.105795	Mean dependent var		-0.172158
Adjusted R-squared	0.105795	S.D. dependent var		2.165958
S.E. of regression	2.048182	Akaike info criterion		4.296465

Sum squared resid	163.6070	Schwarz criterion	4.338687
Log likelihood	-84.92929	Hannan-Quinn criter.	4.311731
Durbin-Watson stat	1.552914		

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic
Elliott-Rootenber-Stock DF-GLS test statistic	-4.562885
Test critical values: 1% level	-2.625606
5% level	-1.949609
10% level	-1.611593

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals
Dependent Variable: D(GLSRESID)
Method: Least Squares
Date: 04/09/24 Time: 19:42
Sample (adjusted): 1983 2021
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.717628	0.157275	-4.562885	0.0001
R-squared	0.353511	Mean dependent var		0.005987
Adjusted R-squared	0.353511	S.D. dependent var		0.229961
S.E. of regression	0.184899	Akaike info criterion		-0.512707
Sum squared resid	1.299131	Schwarz criterion		-0.470051
Log likelihood	10.99778	Hannan-Quinn criter.		-0.497402
Durbin-Watson stat	1.885047			

Null Hypothesis: D(LMINERAL_RENT___OF_GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rootenber-Stock DF-GLS test statistic	-8.013845
Test critical values: 1% level	-2.625606
5% level	-1.949609
10% level	-1.611593

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals
Dependent Variable: D(GLSRESID)
Method: Least Squares

Date: 04/09/24 Time: 19:43
Sample (adjusted): 1983 2021
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-1.259803	0.157203	-8.013845	0.0000
R-squared	0.628082	Mean dependent var		0.078429
Adjusted R-squared	0.628082	S.D. dependent var		3.637897
S.E. of regression	2.218575	Akaike info criterion		4.456914
Sum squared resid	187.0389	Schwarz criterion		4.499570
Log likelihood	-85.90983	Hannan-Quinn criter.		4.472219
Durbin-Watson stat	1.780698			

Null Hypothesis: D(LPRICE_PER_POUND) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rootenber-Stock DF-GLS test statistic	-4.569477
Test critical values:	
1% level	-2.625606
5% level	-1.949609
10% level	-1.611593

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals
Dependent Variable: D(GLSRESID)
Method: Least Squares
Date: 04/09/24 Time: 19:44
Sample (adjusted): 1983 2021
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.752540	0.164688	-4.569477	0.0001
R-squared	0.352498	Mean dependent var		0.015332
Adjusted R-squared	0.352498	S.D. dependent var		0.270795
S.E. of regression	0.217902	Akaike info criterion		-0.184235
Sum squared resid	1.804291	Schwarz criterion		-0.141579
Log likelihood	4.592581	Hannan-Quinn criter.		-0.168931
Durbin-Watson stat	1.870558			

Null Hypothesis: D(LTRADE_VALUE_MARGINS) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

t-Statistic

Elliott-Rootenber-Stock DF-GLS test statistic	-5.314200
Test critical values:	1% level
	5% level
	10% level

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals

Dependent Variable: D(GLSRESID)

Method: Least Squares

Date: 04/09/24 Time: 19:45

Sample (adjusted): 1983 2020

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.864882	0.162749	-5.314200	0.0000
R-squared	0.432866	Mean dependent var		-0.002970
Adjusted R-squared	0.432866	S.D. dependent var		1.126645
S.E. of regression	0.848457	Akaike info criterion		2.535169
Sum squared resid	26.63555	Schwarz criterion		2.578263
Log likelihood	-47.16821	Hannan-Quinn criter.		2.550502
Durbin-Watson stat	1.938846			

Null Hypothesis: D(EXCHANGE_RATE) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rootenber-Stock DF-GLS test statistic	-7.352526
Test critical values:	1% level
	5% level
	10% level

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals

Dependent Variable: D(GLSRESID)

Method: Least Squares

Date: 04/09/24 Time: 19:45

Sample (adjusted): 1984 2021

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-2.000063	0.272024	-7.352526	0.0000
D(GLSRESID(-1))	0.334062	0.157094	2.126516	0.0404
R-squared	0.777555	Mean dependent var		0.043158
Adjusted R-squared	0.771376	S.D. dependent var		411.4207
S.E. of regression	196.7193	Akaike info criterion		13.45263

Sum squared resid	1393146.	Schwarz criterion	13.53882
Log likelihood	-253.5999	Hannan-Quinn criter.	13.48329
Durbin-Watson stat	2.169811		

Null Hypothesis: D(INFLATION_RATE) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=2)

	t-Statistic
Elliott-Rothenberg-Stock DF-GLS test statistic	-2.858820
Test critical values: 1% level	-2.628961
5% level	-1.950117
10% level	-1.611339

*MacKinnon (1996)

DF-GLS Test Equation on GLS Detrended Residuals

Dependent Variable: D(GLSRESID)

Method: Least Squares

Date: 04/09/24 Time: 19:46

Sample (adjusted): 1985 2021

Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GLSRESID(-1)	-0.880128	0.307864	-2.858820	0.0072
D(GLSRESID(-1))	0.001639	0.218484	0.007504	0.9941
D(GLSRESID(-2))	-0.389290	0.158034	-2.463326	0.0190
R-squared	0.654521	Mean dependent var		0.302162
Adjusted R-squared	0.634198	S.D. dependent var		41.97084
S.E. of regression	25.38461	Akaike info criterion		9.383768
Sum squared resid	21908.87	Schwarz criterion		9.514383
Log likelihood	-170.5997	Hannan-Quinn criter.		9.429816
Durbin-Watson stat	1.908876			

Dependent Variable: BINARY_SATISFACTION

Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)

Date: 10/17/25 Time: 12:05

Sample: 1 250

Included observations: 250

Convergence achieved after 3 iterations

Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ENGAGEMENT_EFFECTIVENESS_NUM	-0.000552	0.088960	-0.006202	0.9951
ENGAGEMENT_FREQUENCY_NUM	-0.081044	0.094603	-0.856669	0.3916
INFLUENCE_GOVERNANCE_NUM	0.041943	0.091884	0.456474	0.6480
C	-0.305104	0.332621	-0.917273	0.3590

McFadden R-squared	0.002882	Mean dependent var	0.408000
S.D. dependent var	0.492449	S.E. of regression	0.494445
Akaike info criterion	1.380347	Sum squared resid	60.14099
Schwarz criterion	1.436690	Log likelihood	-168.5434
Hannan-Quinn criter.	1.403024	Deviance	337.0867
Restr. deviance	338.0612	Restr. log likelihood	-169.0306
LR statistic	0.974434	Avg. log likelihood	-0.674173
Prob(LR statistic)	0.807438		
Obs with Dep=0	148	Total obs	250
Obs with Dep=1	102		

APPENDIX B: LONG RUN ARDL COEFFICIENTS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCEXP	1.0239	0.5119	2.0001	0.0600
IR	0.0279	0.0117	2.3842	0.0277
ER	-0.0090	0.0035	-2.5624	0.0190
LGDP	3.4849	1.4754	2.3619	0.0290
LMR	0.9354	0.4719	1.9821	0.0621
LPRICE	-8.2424	2.8568	-2.8851	0.0095
LTVM	0.4044	0.3192	1.2670	0.2205
C	-	32.135	-2.2240	0.0385
	71.4702	0		
F-Bounds Test	<i>Null Hypothesis: No levels relationship</i>			
Test Statistic	<i>Value</i>	<i>Signif.</i>	<i>I(0)</i>	<i>I(1)</i>
			Asymptotic: n=1000	
F-statistic	3.4129	10%	1.92	2.89
	49			
K	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9
Actual Sample Size	38		Finite Sample: n=40	
		10%	2.152	3.296
		5%	2.523	3.829
		1%	3.402	5.031
			Finite Sample: n=35	
		10%	2.196	3.37
		5%	2.597	3.907
		1%	3.599	5.23
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.

LGDP	-	1.3170	-	0.4016
	1.12471	89	0.85393	
	0		6	
LMR	0.28004	0.3656	0.76587	0.4512
	8	56	8	
LPRICE	-	2.5312	-	0.9709
	0.09346	65	0.03692	
	8		5	
LTVM	0.51986	0.3443	1.50987	0.1441
	7	11	6	
LCEXP	0.81728	0.5582	1.46392	0.1562
	5	85	0	
C	29.6773	29.097	1.01994	0.3179
	6	10	2	
EC = LCVA - (-1.1247*LGDP + 0.2800*LMR- 0.0935				
*LPRICE + 0.5199*LTVM + 0.8173				
*LCEXP + 29.6774)				

ARDL Error Correction Regression (Continued)

Dependent Variable: D(LCVA)

Selected Model: ARDL(1, 2, 2, 2, 1, 2, 0, 1)

Case 2: Restricted Constant and No Trend

Included observations: 38

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCEXP)	0.6656	0.1988	3.3471	0.0034
D (LCEXP (-1))	0.7919	0.1676	4.7249	0.0001
D(IR)	0.0147	0.0048	3.0164	0.0071
D (IR (-1))	-0.0150	0.0051	-2.9191	0.0088
D(ER)	-0.0013	0.0007	-1.8541	0.0793
D (ER (-1))	0.0026	0.0006	3.8646	0.0010
D (LGDP)	5.9529	1.1156	5.3358	0.0000
D (LMR)	0.4215	0.0824	5.1161	0.0001
D (LMR (-1))	-0.2604	0.0768	-3.3908	0.0031
D(LTVM)	-0.8189	0.1880	-4.3559	0.0003
CointEq (-1) *	-0.6318	0.0956	-6.6068	0.0000
R-squared	0.8131	Mean dependent var		0.1041
Adjusted R-squared	0.7439	S.D. dependent var		1.5510
S.E. of regression	0.7848	Akaike info criterion		2.5906
Sum squared resid	16.6335	Schwarz criterion		3.0647
Log likelihood	-38.2225	Hannan-Quinn criter.		2.7593
Durbin-Watson stat	2.3670			
* p-value incompatible with t-Bounds distribution.				

Dependent Variable: RESIDUE

Method: ARDL

Date: 04/09/24 Time: 19:05

Sample: 1983 2020

Included observations: 38

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCVA(-1)	0.092627	0.190436	0.486396	0.6329
EXCHANGE_RATE	0.000249	0.001255	0.198101	0.8453
EXCHANGE_RATE(-1)	0.000437	0.001158	0.377193	0.7107
EXCHANGE_RATE(-2)	0.000128	0.001066	0.120064	0.9058
INFLATION_RATE	0.000739	0.006964	0.106102	0.9167
INFLATION_RATE(-1)	0.001018	0.008476	0.120124	0.9058
INFLATION_RATE(-2)	-0.002769	0.007447	-0.371887	0.7146
LCOPPER_EXPORTS__B_	-0.029913	0.388310	-0.077034	0.9395
LCOPPER_EXPORTS__B_(-1)	-0.017051	0.232952	-0.073197	0.9425
LCOPPER_EXPORTS__B_(-2)	-0.045054	0.245318	-0.183656	0.8565
LGDP	-0.381415	2.035593	-0.187373	0.8536
LGDP(-1)	-0.140862	1.384790	-0.101721	0.9202
LMINERAL_RENT__OF_GDP	-0.003909	0.145180	-0.026925	0.9788
LMINERAL_RENT__OF_GDP(-1)	-0.050373	0.129146	-0.390044	0.7013
LMINERAL_RENT__OF_GDP(-2)	0.036117	0.123621	0.292157	0.7737
LPRICE_PER_POUND	0.758146	1.938503	0.391099	0.7006
LTRADE_VALUE_MARGINS	-0.124932	0.307498	-0.406285	0.6896
LTRADE_VALUE_MARGINS(-1)	0.111854	0.295440	0.378600	0.7097
C	10.61656	21.74006	0.488341	0.6315
RESID(-1)	-0.365571	0.388145	-0.941843	0.3595
RESID(-2)	0.263080	0.392160	0.670848	0.5113
R-squared	0.168282	Mean dependent var		-1.48E-15
Adjusted R-squared	-0.810209	S.D. dependent var		0.670489
S.E. of regression	0.902103	Akaike info criterion		2.932715
Sum squared resid	13.83444	Schwarz criterion		3.837697
Log likelihood	-34.72159	Hannan-Quinn criter.		3.254701
F-statistic	0.171982	Durbin-Watson stat		1.775824
Prob(F-statistic)	0.999845			

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

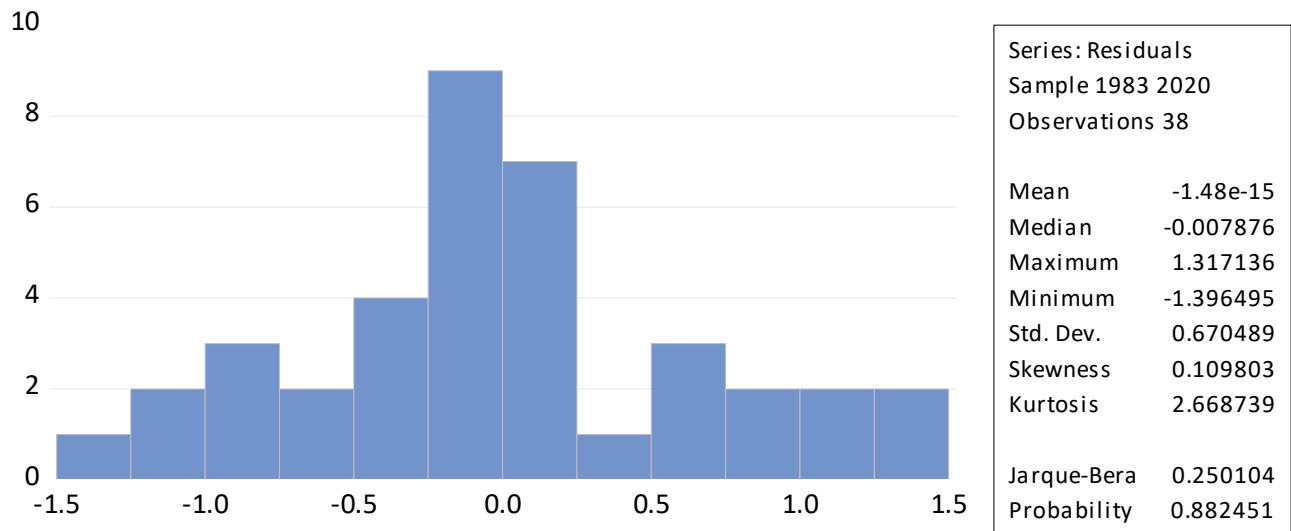
F-statistic	1.719815	Prob. F(2,17)	0.2088
Obs*R-squared	6.394732	Prob. Chi-Square(2)	0.0409

APPENDIX C: DIAGNOSTIC TESTS FOR ARDL MODEL

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

F-statistic	1.006849	Prob. F(18,19)	0.4925
Obs*R-squared	18.55129	Prob. Chi-Square(18)	0.4199
Scaled explained SS	3.869657	Prob. Chi-Square(18)	0.9998



Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.293917	Prob. F(2,244)	0.2088
Obs*R-squared	0.600842	Prob. Chi-Square(2)	0.2105

APPENDIX D: CORRELATION MATRIX OF MAIN VARAIABLES

	Engagement effectiveness	Engagement frequency	Influence governance
Engagement effectiveness	1	0.04053450959438196	0.05542138005678597
Engagement frequency	0.04053450959438196	1	-0.03324334756961698
Influence governance	0.05542138005678597	-0.03324334756961698	1

APPENDIX E: BINARY LOGISTIC REGRESSION RESULTS

Dependent Variable: BINARY_SATISFACTION
Method: Least Squares
Date: 10/17/25 Time: 11:59
Sample: 1 250
Included observations: 250

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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ENGAGEMENT_EFFECTIVENESS_NUM	-0.000161	0.021560	-0.007487	0.9940
ENGAGEMENT_FREQUENCY_NUM	-0.019526	0.022910	-0.852324	0.3949
INFLUENCE_GOVERNANCE_NUM	0.010114	0.022278	0.453990	0.6502
C	0.424565	0.080850	5.251247	0.0000

R-squared	0.003894	Mean dependent var	0.408000
Adjusted R-squared	-0.008254	S.D. dependent var	0.492449
S.E. of regression	0.494477	Akaike info criterion	1.445239
Sum squared resid	60.14888	Schwarz criterion	1.501582
Log likelihood	-176.6549	Hannan-Quinn criter.	1.467916
F-statistic	0.320532	Durbin-Watson stat	2.058262
Prob(F-statistic)	0.810526		

Ramsey RESET Test

Equation: UNTITLED

Omitted Variables: Squares of fitted values

Specification: BINARY_SATISFACTION ENGAGEMENT_EFFECTIVENESS
_NUM ENGAGEMENT_FREQUENCY_NUM INFLUENCE_GOVERNA
NCE_NUM C

	Value	df	Probability
t-statistic	1.339694	245	0.1816
F-statistic	1.794779	(1, 245)	0.1816
Likelihood ratio	1.824732	1	0.1768

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.437424	1	0.437424
Restricted SSR	60.14888	246	0.244508
Unrestricted SSR	59.71146	245	0.243720

LR test summary:

	Value
Restricted LogL	-176.6549
Unrestricted LogL	-175.7425

Unrestricted Test Equation:

Dependent Variable: BINARY_SATISFACTION

Method: Least Squares

Date: 10/17/25 Time: 12:01

Sample: 1 250

Included observations: 250

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ENGAGEMENT_EFFECTIVENESS_NUM	0.008807	0.022542	0.390702	0.6964
ENGAGEMENT_FREQUENCY_NUM	0.648988	0.499530	1.299199	0.1951
INFLUENCE_GOVERNANCE_NUM	-0.337914	0.260732	-1.296020	0.1962
C	-7.163935	5.664931	-1.264611	0.2072
FITTED^2	41.92823	31.29688	1.339694	0.1816

R-squared	0.011138	Mean dependent var	0.408000
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Adjusted R-squared	-0.005007	S.D. dependent var	0.492449
S.E. of regression	0.493680	Akaike info criterion	1.445940
Sum squared resid	59.71146	Schwarz criterion	1.516369
Log likelihood	-175.7425	Hannan-Quinn criter.	1.474286
F-statistic	0.689870	Durbin-Watson stat	2.069240
Prob(F-statistic)	0.599586		

Goodness-of-Fit Evaluation for Binary Specification

Andrews and Hosmer-Lemeshow

Tests

Equation: UNTITLED

Date: 10/17/25 Time: 12:10

Grouping based upon predicted risk (randomise ties)

	Quantile of Risk		Dep=0		Dep=1		Total Obs	H-L Value
	Low	High	Actual	Expect	Actual	Expect		
1	0.3472	0.3667	15	16.0219	10	8.97806	25	0.18151
2	0.3668	0.3767	18	15.6521	7	9.34787	25	0.94189
3	0.3767	0.3860	13	15.3803	12	9.61967	25	0.95739
4	0.3860	0.3955	14	15.2087	11	9.79130	25	0.24527
5	0.3957	0.4052	15	14.9379	10	10.0621	25	0.00064
6	0.4052	0.4152	16	14.7529	9	10.2471	25	0.25720
7	0.4152	0.4252	18	14.4427	7	10.5573	25	2.07486
8	0.4253	0.4351	16	14.2061	9	10.7939	25	0.52469
9	0.4351	0.4456	12	13.9105	13	11.0895	25	0.59154
10	0.4549	0.4657	11	13.4868	14	11.5132	25	0.99569
Total			148	148.000	102	102.000	250	6.77068
H-L Statistic			6.7707	Prob. Chi-Sq(8)		0.5616		
Andrews Statistic			10.0591	Prob. Chi-Sq(10)		0.4353		

APPENDIX F: QUESTIONNAIRE

Instructions

Please indicate the extent to which you agree or disagree with the following statements based on your experience.

Introduction

You are invited to participate in a research study examining stakeholder engagement and governance in Zambia's copper mining sector. The study seeks to understand how different stakeholder groups including

mining companies, government institutions, mine workers, and local communities perceive and experience participation, transparency, communication, and decision-making processes within the sector.

Zambia's copper mining industry plays a central role in national economic development, yet persistent governance challenges such as unequal participation, limited transparency, political interference, and weak implementation of stakeholder agreements continue to affect its sustainability and social legitimacy. This questionnaire aims to collect empirical evidence on these issues to support policy-relevant analysis and contribute to improved governance practices in the mining sector.

Participation in this study is entirely voluntary. Your responses will be collected anonymously, and no personally identifiable information will be requested or recorded. All information provided will be treated with strict confidentiality and will be used solely for academic research purposes. The data will be aggregated and reported in a manner that ensures individual responses cannot be traced back to any participant or organisation.

By completing this questionnaire, you indicate your informed consent to participate in the study. Your honest responses are valuable and will contribute to a deeper understanding of stakeholder engagement dynamics and governance outcomes in Zambia's copper mining sector.

Thank you for taking the time to participate in this research.

Section 1: Background Information

1. Your primary role in the copper mining sector is:

- ☐ Mining company representative
- ☐ Mine worker
- ☐ Community member
- ☐ Government institution

2. Length of involvement in the copper mining sector:

- ☐ Less than 1 year
- ☐ 1–5 years
- ☐ 6–10 years
- ☐ More than 10 years

Section 2: Stakeholder Participation and Inclusiveness

Please indicate your level of agreement:

3. All stakeholder groups are equally represented in decision-making processes within the copper mining sector.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

4. Local communities are adequately involved in consultations before major mining decisions are made.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

5. Some stakeholder groups have more influence over mining governance decisions than others.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

6. The views of mine workers and local communities are taken seriously by mining companies and government institutions.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 3: Communication and Information Sharing

7. Information about mining operations and policies is communicated clearly to all stakeholders.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

8. Stakeholders receive timely information regarding decisions that affect them.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

9. Technical or legal information related to mining governance is difficult for non-experts to understand.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

10. There is unequal access to information among different stakeholder groups.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 4: Transparency and Trust in Governance

11. Decisions made in the copper mining sector are transparent and openly communicated.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

12. Mining companies are honest and open about the social and environmental impacts of their operations.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

13. I trust government institutions to regulate the mining sector in the public interest.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

14. Lack of transparency has contributed to conflicts between mining companies and communities.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 5: Political and Institutional Interference

15. Political interests influence decision-making in Zambia's copper mining sector.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

16. Regulatory institutions operate independently from political pressure.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

17. Changes in government or political leadership affect mining policies and governance practices.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

18. Institutional capacity is sufficient to enforce mining regulations effectively.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 6: Follow-Up, Accountability, and Implementation

19. Agreements reached during stakeholder consultations are consistently implemented.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

20. There are clear mechanisms to monitor compliance with decisions made through stakeholder engagement.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

21. Stakeholders are informed about progress made after consultations.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

22. Lack of follow-up has reduced trust in stakeholder engagement processes.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 7: Overall Assessment

23. Stakeholder engagement in Zambia's copper mining sector contributes to improved governance outcomes.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

24. Increasing stakeholder engagement would reduce conflict and improve policy effectiveness.

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

Thank you for your participation.

APPENDIX G: ETHICAL CLEARANCE



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UNILUS-RESEARCH ETHICS COMMITTEE

Ref no: FWA00033228-48108/25

Date: 20TH NOVEMBER 2025

STUDENT NAME: **BONDO CHISANGA**

TITLE: ECONOMIC FACTORS, COPPER VALUE CHAIN AND STAKEHOLDER ENGAGEMENT IN ZAMBIA

The above research was submitted to the research ethics committee for review. The study has no major ethical problems and is approved subject to the following:

1. The study cannot be changed without the express permission of the UNILUS research ethics committee.
2. Approval from the necessary authority should be sought.

Congratulations, and the committee wishes you success in your work.

Professor Kasonde Bowa

MSc(Glasgow), M.Med(UNZA), FRCS(Glasgow), FACS, FCS, DPH(LSTMH), MPH(UCL)

Chairman - UNILUS REC

Professor of Urology and Consultant Urologist

Deputy Vice-Chancellor – Research and Innovation

Executive Dean - School of Medicine and Health Sciences