ISSN: 2958-2326

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African Journal of Commercial Studies

Publisher's Home Page: https://ijcsacademia.com/

AFRICAN JOURNAL OF COMMERCIAL STUDIES

Research Paper | Peer Reviewed | Open Access

Assessing the Impacts of Exchange Rate Volatility on Donor-Funded Projects: The Case of iDE Zambia

Majorie Siamwaala[1]*, Dr. Yohane Romeo[2]

[1]*Graduate School of Business, University of Zambia*
[2]*School of Humanities, University of Zambia*
* Corresponding Author

Article Info

Volume 7, Issue 3

***Publication history*:**
Accepted on 18 April 2026;
Published: 30 April 2026

***Key Words*:**
Exchange-rate volatility; donor-funded programmes; Zambia; financial performance; programme resilience; mixed methods; ERPT theory; Contingency Theory; development effectiveness

***Article Doi*:**
10.59413/ajocs/v7.i3.18

Abstract

Exchange-rate volatility remains a critical constraint on donor-funded development programmes in low- and middle-income countries, yet its transmission mechanisms across programme and beneficiary levels remain insufficiently understood. This study examines the effects of exchange-rate volatility on financial performance, operational efficiency, and social outcomes of donor-funded programmes in Zambia, using iDE Zambia as a case study over the period 2015–2025. A mixed-methods approach was employed, integrating econometric trend analysis, regression modelling, and descriptive statistics with qualitative insights from surveys (n = 157), key informant interviews, and document review. The analysis is grounded in Exchange Rate Pass-Through (ERPT) theory and Contingency Theory to explain how macroeconomic shocks influence organisational performance and development outcomes. Findings reveal that the Zambian Kwacha depreciated by over 300% against the US dollar during the study period, with notable volatility spikes in 2016 and 2020. Regression results indicate statistically significant effects of exchange-rate volatility on financial disruption ($\beta = 0.68$, $p < 0.001$), operational inefficiency ($\beta = 0.59$, $p < 0.001$), and adverse social outcomes ($\beta = 0.63$, $p < 0.001$). At the programme level, volatility contributed to budget erosion, procurement cost escalation, and implementation delays. At the beneficiary level, it reduced access to inputs, lowered productivity, and weakened household incomes. The study concludes that exchange-rate volatility operates as a multi-level development constraint, transmitting macroeconomic shocks through programme systems to household welfare. It highlights the inadequacy of reactive mitigation approaches and emphasises the need for adaptive financing frameworks, proactive risk management, and enhanced institutional resilience in donor programming.

1. Introduction

1.1 Background of the Study

Exchange-rate volatility remains one of the most persistent macroeconomic constraints affecting development finance in low- and middle-income countries. Donor-funded programmes are typically financed in stable foreign currencies such as the United States dollar (USD) or the euro (EUR), while implementation costs are largely incurred in domestic currencies. This structural currency mismatch exposes development interventions to foreign exchange risk, introducing uncertainty into budgeting, procurement, and operational planning (IMF, 2023; World Bank, 2022).

Empirical literature demonstrates that exchange-rate fluctuations increase transaction costs, distort budget forecasts, and weaken operational efficiency in development programmes (Edwards, 2019; Aghion et al., 2021). These effects are particularly pronounced during global economic disruptions such as the COVID-19 pandemic, which intensified currency instability across developing economies (IMF, 2023; UNDP, 2022).

In Sub-Saharan Africa, structural vulnerabilities, including narrow export bases, high dependence on primary commodities, and shallow financial markets, exacerbate exchange-rate instability and amplify inflationary pressures (UNECA, 2021; World Bank, 2023). Consequently, the real value of donor funding is eroded, reducing programme effectiveness and long-term sustainability.

Zambia provides a compelling empirical context for examining these dynamics. The country's heavy reliance on copper exports exposes it to global commodity price fluctuations, directly influencing foreign exchange inflows and currency stability. Since adopting a flexible exchange-rate regime in 1997, the Zambian kwacha has experienced recurrent volatility, particularly between 2015 and 2025 (Bank of Zambia, 2024; IMF, 2023).

Table 1: Zambia Inflation Trends (2015–2025)

Year	Inflation (%)	Key Drivers
2015	7.7	Currency depreciation, fuel shocks
2019	11.7	Exchange-rate pressure
2020	15.7	COVID-19 disruptions
2021	22.0	Severe depreciation
2025	11.1	Partial stabilisation

Source: IMF (2023); World Bank (2023); Bank of Zambia (2024)

Table 2: Exchange Rate (ZMW/USD) Trends (2015–2025)

Year	Range	Trend
2015	5.5–8.5	Sharp depreciation
2021	18–22	High volatility
2024	20–24	Import pressure peak
2025	18–22	Partial recovery

Source: Bank of Zambia (2024); IMF (2023)

These macroeconomic conditions have direct implications for donor-funded programmes such as those implemented by iDE Zambia, which depend heavily on imported agricultural inputs and foreign-denominated financing.

1.2 Statement of the Problem

Donor-funded development programmes play a central role in poverty reduction and agricultural transformation in Zambia. However, their effectiveness is increasingly constrained by exchange-rate volatility. Currency depreciation reduces the real purchasing power of donor funds, leading to budget shortfalls, procurement inefficiencies, and implementation delays (World Bank, 2022; IMF, 2023).

Despite the operational significance of these challenges, empirical evidence linking exchange-rate volatility to programme-level performance remains limited. Existing studies predominantly focus on macroeconomic outcomes, with insufficient attention to organisational-level transmission mechanisms such as procurement efficiency, financial planning accuracy, and beneficiary outcomes (Aghion et al., 2021; Edwards, 2019).

This gap constrains the ability of development organisations to design robust financial risk management systems and limits evidence-based policy adjustments by donors. Addressing this gap is therefore critical for improving programme resilience and effectiveness in volatile macroeconomic environments.

1.3 Objectives of the Study

General Objective

To analyse the impact of exchange-rate volatility on the performance of donor-funded programmes in Zambia, with specific reference to iDE Zambia.

Specific Objectives

- To analyse exchange-rate and inflation trends in Zambia (2015–2025).
- To evaluate the financial and operational impacts of exchange-rate volatility on donor-funded programmes.
- To examine the effects of exchange-rate volatility on beneficiary outcomes, including productivity and income.

1.4 Research Questions

- How does exchange-rate volatility affect programme implementation efficiency?
- What are the financial and operational implications for donor-funded programmes?
- How does exchange-rate volatility influence beneficiary-level outcomes?

1.5 Theoretical Framework

This study is anchored in three complementary theoretical perspectives: Exchange Rate Pass-Through (ERPT), Purchasing Power Parity (PPP), and Contingency Theory.

The Exchange Rate Pass-Through (ERPT) framework explains how exchange-rate movements are transmitted into domestic prices, particularly for imported goods and services. Empirical evidence from Zambia indicates that currency depreciation is partially and asymmetrically transmitted into domestic prices, with stronger effects during depreciation episodes (IMF, 2023). For donor-funded programmes, this implies that depreciation rapidly increases the cost of imported inputs such as irrigation equipment and agricultural technologies.

The Purchasing Power Parity (PPP) theory provides a long-term perspective by linking exchange-rate movements to inflation differentials. Sustained inflation and currency depreciation reduce the real value of foreign-denominated funding over time, even when nominal budgets remain constant (World Bank, 2023; IMF, 2023). This results in gradual erosion of programme scale and effectiveness.

The Contingency Theory introduces an organisational dimension, emphasising that institutional effectiveness depends on alignment with external environmental conditions. Development organisations operating in volatile macroeconomic environments must continuously adapt financial planning, procurement systems, and implementation strategies to remain effective (Donaldson, 2018; UNDP, 2022).

Together, these theories provide a coherent explanatory pathway: ERPT captures short-term cost escalation, PPP explains long-term erosion of purchasing power, and Contingency Theory explains organisational adaptation. This integrated framework links macroeconomic instability to financial constraints, operational inefficiencies, and reduced programme performance.

1.6 Conceptual Framework

This study conceptualises exchange-rate volatility as the primary independent variable influencing donor-funded programme performance through a multi-

pathway transmission mechanism.

Three key pathways are identified:

- Financial Performance Pathway: Budget instability, cost escalation, and reduced purchasing power of donor funds.
- Operational Performance Pathway: Procurement delays, implementation bottlenecks, and rescheduling of programme activities.
- Beneficiary Outcome Pathway: Reduced access to inputs, declining productivity, and lower household income.

These relationships are moderated by institutional factors such as financial management systems, procurement efficiency, and donor flexibility. Strong institutional systems can absorb shocks, whereas weak systems amplify them.

Unlike conventional approaches that treat exchange-rate movements as purely macroeconomic disturbances, this framework positions development programmes as active transmission channels through which macroeconomic shocks are translated into real development outcomes.

1.7 iDE Zambia Programme Exposure

Internal financial data from iDE Zambia (2019–2024) provide empirical validation of the conceptual framework by demonstrating consistent budget deviations linked to exchange-rate fluctuations.

Table 3: Illustrative iDE Zambia Budget Variance

Year	Budget (USD)	Variance (%)	Key Driver
2019	1.2M	10%	Currency depreciation
2021	1.3M	23%	Severe kwacha weakening
2024	2.0M	10%	Persistent FX volatility

The highest variance is observed in 2021, corresponding with significant currency depreciation. These deviations are most pronounced in imported input categories such as irrigation equipment, agricultural technologies, and ICT tools.

This programme-level evidence strengthens the study by demonstrating how exchange-rate volatility translates into operational budget distortions, an area often overlooked in macroeconomic analyses.

1.8 Significance of the Study

This study contributes to development economics, programme management, and policy design by addressing a critical empirical gap: the linkage between exchange-rate volatility and programme-level outcomes.

- Practical Contribution: Enhances NGO financial planning through scenario-based budgeting, currency sensitivity analysis, and adaptive procurement systems.
- Policy Contribution: Supports the design of flexible donor financing mechanisms, including exchange-rate indexation and automatic adjustment clauses (IMF, 2023).
- Academic Contribution: Extends existing literature by integrating financial, operational, and beneficiary-level impacts into a unified analytical framework.

1.9 Scope of the Study

The study focuses on iDE Zambia donor-funded programmes implemented between 2015 and 2025. It examines budgeting, procurement, and implementation performance under conditions of exchange-rate volatility.

2 Literature Review

2.1 Historical and Conceptual Overview

Donor-funded development programmes in low- and middle-income countries are typically financed in stable foreign currencies such as the United States dollar (USD) or the euro (EUR), while expenditures are incurred in domestic currencies. This structural currency mismatch exposes programmes to exchange-rate risk, whereby currency depreciation reduces the real value of available funds and increases the cost of imported inputs. Empirical evidence consistently demonstrates that such exposure leads to budget distortions, declining purchasing power, and inefficiencies in programme implementation (IMF, 2023; World Bank, 2022; OECD, 2021).

At the global level, development finance institutions recognise exchange-rate volatility as a major constraint on aid effectiveness. It is associated with cost overruns, procurement delays, and reduced predictability in programme execution (OECD, 2021; World Bank, 2023). In Sub-Saharan Africa, these effects are intensified by structural vulnerabilities, including dependence on primary commodities, limited foreign exchange reserves, and high external debt exposure (UNECA, 2021; IMF, 2023).

In Zambia, exchange-rate instability has been persistent, driven by fluctuations in copper export revenues, inflationary pressures, and fiscal imbalances. This volatility has direct implications for donor-funded programmes, particularly in agriculture and market systems development, where imported inputs such as fertilisers, irrigation equipment, and improved seed varieties are central to implementation (Bank of Zambia, 2024; World Bank, 2023).

2.2 Theoretical Foundations

Exchange Rate Pass-Through (ERPT) Theory

The Exchange Rate Pass-Through (ERPT) theory explains how exchange-rate movements are transmitted into domestic prices and cost structures. In developing economies, pass-through effects are typically high due to import dependence and structural rigidities in markets (Gopinath et al., 2020; IMF, 2023). Empirical evidence further indicates that pass-through is asymmetric, with depreciation effects being stronger and more persistent than appreciation effects (Caselli & Roitman, 2019).

Within donor-funded programmes, ERPT implies that currency depreciation directly increases procurement costs for imported goods and services, thereby reducing the real purchasing power of programme budgets. This mechanism is critical for explaining cost escalation, budget overruns, and operational inefficiencies in externally financed interventions.

Purchasing Power Parity (PPP)

Purchasing Power Parity (PPP) provides a long-run theoretical explanation of exchange-rate movements by linking currency values to inflation differentials across countries. While PPP tends to hold in the long term, short-term deviations are common in economies characterised by macroeconomic instability and structural imbalances (Rogoff, 2017; IMF, 2023).

In development programming contexts, PPP highlights how sustained inflation and currency depreciation gradually erode the real value of foreign-denominated funding. Even where nominal budgets remain unchanged, their effective purchasing power declines over time, reducing programme scale, coverage, and overall effectiveness (World Bank, 2023).

Contingency Theory

Contingency Theory posits that organisational effectiveness depends on the alignment between internal systems and external environmental conditions (Donaldson, 2018). In volatile macroeconomic environments, organisations must continuously adapt their financial, procurement, and operational systems to maintain performance.

For donor-funded NGOs, this translates into adaptive strategies such as flexible budgeting, procurement rescheduling, scenario-based planning, and dynamic resource allocation. The theory, therefore, provides a critical lens for understanding how institutional responses can either mitigate or amplify the effects of exchange-rate volatility on programme outcomes.

2.3 Exchange-Rate Volatility and Aid Dynamics

Exchange-rate volatility interacts with aid flows to create multiple layers of financial uncertainty. Aid disbursements are often irregular in both timing and magnitude, and when combined with currency fluctuations, they generate three primary forms of risk: translation risk, transaction risk, and procurement risk (OECD, 2021; IMF, 2023).

- Translation risk arises when foreign currency funds are converted into local currency at fluctuating rates.
- Transaction risk occurs between commitment and disbursement periods due to exchange-rate movements.
- Procurement risk emerges when currency depreciation increases the cost of imported inputs.

Empirical studies across Sub-Saharan Africa indicate that these risks frequently result in budget reallocations, delayed implementation cycles, and reduced programme effectiveness (UNECA, 2021; World Bank, 2023).

2.4 Macroeconomic Context and Programme-Level Implications

Macroeconomic instability, characterised by exchange-rate volatility, inflation, and fiscal imbalances, has direct implications for development programme performance. Evidence shows that currency depreciation increases input costs, disrupts procurement systems, and reduces programme coverage (IMF, 2023; World Bank, 2022).

Empirical evidence across regions consistently shows that exchange-rate volatility undermines development effectiveness, particularly in externally financed programmes. Studies from Latin America and Asia demonstrate that currency instability contributes to cost overruns, procurement delays, and reduced implementation efficiency in infrastructure and social sector programmes (Aghion et al., 2021; World Bank, 2023).

Similar patterns are observed in Sub-Saharan Africa. Evidence from Nigeria and Ghana indicates that currency depreciation significantly increases procurement costs and disrupts project timelines (UNECA, 2021). In East Africa, studies from Kenya and Uganda reveal that NGOs frequently adjust procurement schedules, renegotiate contracts, and modify operational plans in response to exchange-rate risk, often at the expense of efficiency and programme continuity (IMF, 2023).

In Zambia, econometric studies confirm strong exchange-rate pass-through effects into domestic inflation, indicating a tight linkage between currency movements and price dynamics (Bank of Zambia, 2024). These macroeconomic pressures translate into programme-level constraints, including delayed procurement, reduced input availability, and constrained service delivery. Inflation further compounds these effects by eroding household purchasing power, thereby weakening the effectiveness of development interventions aimed at improving livelihoods.

However, much of this literature remains concentrated at macroeconomic or sectoral levels, with limited attention to internal organisational dynamics. Specifically, there is insufficient understanding of how exchange-rate volatility is transmitted through programme systems—such as budgeting, procurement, and delivery mechanisms before affecting development outcomes.

2.5 Social and Beneficiary-Level Impacts

Recent literature increasingly highlights the social consequences of exchange-rate volatility, particularly in agriculture-based development programmes where import dependency is high. Currency depreciation raises the local cost of essential inputs such as seeds, fertilisers, irrigation equipment, and mechanisation services, thereby constraining access for smallholder farmers (World Bank, 2023; FAO, 2022).

These constraints translate into reduced agricultural productivity, declining household incomes, and increased vulnerability in rural economies. Inflation further exacerbates these effects by eroding real incomes and limiting households' capacity to absorb shocks (IMF, 2023).

Evidence from programme implementation contexts reinforces these dynamics. In Zambia, periods of significant kwacha depreciation have been associated with increased costs of irrigation technologies and agro-input packages, leading to reduced input distribution, delayed implementation, and scaled-down programme activities (Bank of Zambia, 2024).

Despite growing recognition of these effects, existing studies rarely link macroeconomic shocks to programme implementation processes. This creates a critical analytical gap in understanding how exchange-rate volatility translates into beneficiary-level outcomes.

2.6 Critique of Existing Literature

Although the literature on exchange-rate volatility and development effectiveness is expanding, several limitations persist.

First, there is a sectoral imbalance, with most studies focusing on macroeconomic indicators or social sectors such as health, while agriculture and market systems development remain underexplored (World Bank, 2023).

Second, methodological limitations are evident. Many studies rely on descriptive analysis or basic regression techniques, limiting causal inference and failing to capture programme-level dynamics (Aghion et al., 2021).

Third, the interaction between exchange-rate volatility and other macroeconomic variables, such as inflation, debt, and commodity price shocks, is often insufficiently addressed, complicating attribution of observed effects (IMF, 2023).

Finally, there is limited empirical evaluation of mitigation strategies, including financial hedging, exchange-rate indexation, and flexible donor funding mechanisms.

2.7 Knowledge Gaps and Research Contribution

The literature revealed three critical gaps.

First, there is limited programme-level empirical evidence linking exchange-rate volatility to operational outcomes such as procurement efficiency, budget execution, and delivery performance. Most studies remain at macroeconomic or sectoral levels.

Second, there is weak integration between macroeconomic theory and organisational analysis. While ERPT and PPP explain price and currency dynamics, they are rarely extended to programme systems and institutional performance.

Third, agriculture-focused donor programmes remain underexamined despite their high exposure to exchange-rate risk.

This study addresses these gaps through a mixed-methods approach combining macroeconomic trend analysis with programme-level financial and operational evidence from iDE Zambia. It further advances the literature by developing a Macro–Programme–Household (MPH) transmission framework, which explicitly links exchange-rate shocks to financial performance, operational efficiency, and beneficiary-level outcomes.

2.8 Synthesis of Literature

The reviewed literature confirms that exchange-rate volatility is a critical constraint on development effectiveness. It affects programmes through cost transmission (ERPT), long-term value erosion (PPP), and organisational adaptation pressures (Contingency Theory).

However, existing studies remain fragmented and predominantly macro-level. This study advances the literature by providing an integrated, multi-level analysis that connects macroeconomic volatility to programme implementation and beneficiary welfare outcomes, thereby bridging the gap between economic theory and development practice.

3 Research Methodology

3.1 Research Philosophy

This study is grounded in a pragmatic research philosophy, which emphasises problem-oriented inquiry and the integration of multiple methods to address complex real-world phenomena. Pragmatism is particularly appropriate in this context because exchange-rate volatility generates both quantifiable financial effects and context-specific organisational responses that cannot be adequately captured through a single methodological approach (Creswell & Plano Clark, 2018; Saunders et al., 2019).

To enhance analytical depth, the study adopts a dual epistemological orientation, combining positivism and interpretivism. The positivist perspective supports the measurement of objective variables, including exchange-rate movements, inflation trends, procurement costs, and budget performance indicators. In contrast, the interpretivist perspective enables the exploration of stakeholder experiences, perceptions, and adaptive responses to financial shocks within programme environments (Bryman, 2016).

The integration of these perspectives facilitates methodological triangulation, combining financial datasets, institutional records, and qualitative insights. This approach enhances the validity, reliability, and contextual richness of findings, particularly in development programme settings where both quantitative trends and human responses are critical to understanding outcomes (Creswell & Creswell, 2018).

3.2 Research Design

The study employs a mixed-methods case study design, integrating quantitative and qualitative approaches within a unified explanatory framework. The quantitative component focuses on measurable indicators such as exchange-rate fluctuations, programme expenditures, procurement costs, and

performance metrics. The qualitative component examines institutional experiences and organisational responses to currency volatility.

The case study approach, centred on iDE Zambia, allows for an in-depth examination of donor-funded agricultural and market systems programmes operating under macroeconomic instability. This design is appropriate because it captures context-specific dynamics and provides a holistic understanding of how exchange-rate volatility affects both financial systems and operational delivery mechanisms (Yin, 2018).

In addition, social and development indicators such as training participation, technology adoption, outreach intensity, and livelihood outcomes were incorporated to capture broader programme impacts. The use of methodological triangulation across multiple data sources enhances analytical robustness and strengthens the credibility of findings (Saunders et al., 2019).

3.3 Study Area

The study was conducted in Zambia, focusing on the North-Western, Copperbelt, and Central Provinces, where iDE Zambia implements agricultural and market systems development programmes. These regions were selected due to their high concentration of programme activities and significant exposure to exchange-rate-sensitive inputs.

The selected provinces are characterised by:

- High dependence on imported agricultural inputs and technologies
- Active implementation of irrigation, seed systems, and value chain development programmes
- Diverse agro-ecological and market conditions influencing programme performance

This geographical scope ensures that the study captures variation in programme exposure to exchange-rate volatility across different implementation contexts.

3.4 Study Population

The target population comprised key stakeholders involved in the design, implementation, and evaluation of donor-funded programmes:

- iDE Zambia staff (N = 44)
- Donor representatives (N = 10)
- Project beneficiaries (Farm Business Advisors and farmers) (N = 450)

iDE staff provided institutional insights into financial management, procurement systems, and operational decision-making. Donor representatives contributed perspectives on funding structures, disbursement mechanisms, and budget flexibility. Beneficiaries offered ground-level evidence on input access, production costs, and livelihood outcomes, enabling assessment of downstream programme effects.

3.5 Sample Size and Sampling Techniques

Sample Size Determination

The sample size was determined using Cochran's (1977) formula at a 95% confidence level and a 5% margin of error, with a finite population correction applied. This resulted in a final sample size of:

n = 181 respondents

Sample Composition

- iDE Zambia staff: 36 respondents (near-census approach)
- Donor representatives: 10 respondents (census)
- Beneficiaries: 135 respondents (randomly selected)

Sampling Techniques

A combination of sampling strategies was employed:

- Purposive sampling: Applied to staff and donor respondents due to their technical expertise and decision-making roles
- Stratified sampling: Ensured representation across programme types and geographic locations
- Simple random sampling: Applied to beneficiaries to minimise selection bias and enhance representativeness

This multi-stage sampling approach improves external validity and reduces systematic sampling error (Saunders et al., 2019).

3.6 Data Collection Methods and Instruments

Data were collected using multiple instruments to ensure methodological triangulation:

- Structured questionnaires: Captured quantitative data on exchange rates, procurement costs, programme expenditures, and performance indicators
- Semi-structured interviews: Explored financial constraints, procurement challenges, and organisational adaptation strategies
- Focus group discussions (FGDs): Captured beneficiary experiences related to input access, production costs, and income changes
- Document review checklist: Analysed financial records, procurement reports, and programme documentation (2015–2025)

Key programme indicators included:

- Training participation rates
- Technology adoption levels
- Programme outreach frequency
- Perceived livelihood improvements

This integrated approach ensured that financial, operational, and social dimensions of exchange-rate impacts were comprehensively captured.

3.7 Data Analysis

Quantitative Analysis

Quantitative data were analysed using statistical software (SPSS through:

- Descriptive statistics (means, percentages, standard deviations)
- Time-series analysis of exchange-rate and inflation trends
- Regression analysis to assess relationships between exchange-rate volatility, costs, and programme performance

Qualitative Analysis

Qualitative data were analysed using thematic analysis, supported by NVivo software, focusing on:

- Procurement and financial risk management challenges
- Organisational adaptation and coping mechanisms
- Institutional responses to exchange-rate shocks

Findings from both datasets were integrated through data triangulation, enhancing interpretive validity and strengthening causal inference (Creswell & Plano Clark, 2018).

3.8 Ethical Considerations

The study adhered to ethical standards consistent with the University of Zambia research guidelines. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection.

Confidentiality and anonymity were strictly maintained, and all data were securely stored and used exclusively for academic purposes. Cultural sensitivity and institutional protocols were observed throughout field engagement, particularly in interactions with community-level participants.

4 Results and Findings

4.1 Response Rate and Data Reliability

A total of 181 questionnaires were distributed, of which 157 were returned fully completed and deemed valid, yielding a response rate of 86.7%. This exceeds widely accepted thresholds in social science research, where response rates above 70% are considered sufficient for robust statistical inference and generalisability (Saunders et al., 2019; Creswell & Creswell, 2018).

Table 4: Response Rate

Category	Frequency	Percentage
Distributed	181	100%
Returned &Valid	157	86.7%
Not Returned	24	13.3%

The relatively low non-response rate (13.3%) primarily attributed to field non-availability and incomplete submissions minimises the risk of non-response bias. Consequently, the dataset demonstrates strong reliability and is suitable for both descriptive and econometric analysis.

4.2 Demographic Characteristics of Respondents

The demographic profile reflects a balanced and analytically robust sample across gender, age, and educational attainment.

Table 5: Demographic Characteristics

Variable	Category	Frequency	%
Gender	Male	91	58
	Female	66	42
Age	18-30	29	18.5
	31-40	56	35.7
	41-50	45	28.7
	>50	27	17.1
Education	Diploma	38	24.2
	Bachelor's	73	46.5
	Master's	36	22.9
	Others	10	6.4

Notably, 69.4% of respondents possess tertiary-level education, enhancing the reliability of responses, particularly for financial and operational variables. This strengthens confidence in the validity of perceptions regarding exchange-rate volatility and programme performance (Bryman, 2016).

4.3 Exchange Rate Exposure Context

Findings reveal a high structural exposure of donor-funded programmes to foreign exchange risk. Approximately 61.8% of programme budgets are denominated in USD, compared to only 8.8% in ZMW, with the remainder classified as mixed or other currencies.

Table 6: Exchange Rate Exposure

Currency	% of Projects
USD	61.8
Mixed	23.5
ZMW	8.8
Other	5.9

This currency structure confirms significant vulnerability to depreciation of the Zambian kwacha. The findings are consistent with Exchange Rate Pass-Through (ERPT) dynamics, whereby depreciation increases the local cost of imported inputs, thereby exerting upward pressure on programme expenditures (IMF, 2023; Gopinath et al., 2020).

4.4 Exchange Rate Trend Analysis

Macroeconomic data from the Bank of Zambia and the IMF indicate sustained depreciation of the ZMW against the USD, with pronounced volatility shocks in 2016 and 2020.

Table 7: Exchange Rate Trend Analysis

Year	ZMW/USD	%Change
2015	6.50	-
2016	10.20	56.9%
2017	10.85	6.4%
2018	11.20	3.2%
2019	12.50	11.6%
2020	22.00	76.0%
2021	22.90	4.1%
2022	24.50	7.0%
2023	25.20	2.9%
2024	26.50	5.2%
2025	26.00	-1.9%

The sharp depreciation in 2020 corresponds with global shocks associated with the COVID-19 pandemic, including reduced export earnings and heightened fiscal pressures (IMF, 2023; Bank of Zambia, 2024). These trends provide strong empirical grounding for analysing exchange-rate pass-through effects on programme costs and performance.

4.5 Descriptive Results

Financial Performance Effects

Table 8: Financial Performance Effects

Indicator	Mean	Interpretation
Budget Variance	4.3	High
Procurement Cost Increase	4.5	Very High
Planning Uncertainty	4.2	High

The results indicate that exchange-rate volatility significantly undermines financial stability by increasing procurement costs and reducing budget predictability. These findings align with ERPT theory and empirical evidence showing that currency depreciation directly translates into higher input costs in aid-financed programmes (World Bank, 2023; OECD, 2021).

Operational Performance Effects

Table 9: Operational Performance Effects

Indicator	Mean	Interpretation
Procument Delays	4.1	Frequent
ActivitybRescheduling	4.0	Moderate High
Resource Reallocation	4.3	High

Operational efficiency was significantly constrained, particularly in procurement-intensive interventions. These findings corroborate existing literature demonstrating that exchange-rate volatility disrupts implementation timelines and weakens programme delivery systems (UNECA, 2021; IMF, 2023).

Social and Beneficiary Outcomes

Table10: Social and Beneficiary Outcomes

Indicator	Mean	Interpretation
Access to Inputs	4.4	Severely reduced
Training Participation	3.9	Moderate impact
Livelihood Outcomes	4.2	Negative

The results confirm a clear transmission mechanism from macroeconomic instability to household-level welfare outcomes. Reduced access to agricultural inputs directly constrains productivity and income generation, consistent with Purchasing Power Parity (PPP) effects on real income erosion (World Bank, 2023; FAO, 2022).

4.6 Regression Analysis and Hypothesis Testing

Model 1: Financial Performance

Variable β t-value p-value

ERV 0.68 5.72 <0.001***

$R^2 = 0.61$

Exchange-rate volatility explains 61% of the variation in financial performance, indicating a strong and statistically significant relationship. The null hypothesis is rejected.

Model 2: Operational Efficiency

Variable β t-value p-value

ERV 0.59 4.89 <0.001***

$R^2 = 0.54$

Exchange-rate volatility significantly reduces operational efficiency through procurement delays and implementation disruptions. The null hypothesis is rejected.

Model 3: Social Outcomes

Variable β t-value p-value

ERV 0.63 5.11 <0.001***

$R^2 = 0.58$

The results confirm that exchange-rate volatility significantly undermines beneficiary welfare outcomes. The null hypothesis is rejected.

Model 4: Organisational Resilience

Variable β t-value p-value

Mitigation Strategies 0.71 6.02 <0.001***

$R^2 = 0.64$

Adaptive strategies have a strong positive effect on organisational resilience, confirming that institutional capacity acts as a critical moderating factor. The null hypothesis is rejected.

4.7 Resilience Mechanisms

Table11: Resilience Mechanisms

Strategy	Mean	Interpretation
Flexible Budgeting	4.6	Highly effective
Donor Flexibility	4.5	Highly effective
Multi-currency Budgeting	4.4	Very effective
Forecasting	4.3	Highly effective
Procurement	4.2	Effective

These findings support Contingency Theory, demonstrating that organisational adaptability significantly enhances resilience under conditions of macroeconomic uncertainty (Donaldson, 2018).

4.8 Interpretation of Findings

Financial Implications

Exchange-rate volatility generates systematic budget erosion and cost escalation, confirming strong ERPT effects where depreciation is rapidly transmitted into procurement costs.

Operational Implications

Procurement systems emerge as the most vulnerable functional area, leading to delays, rescheduling, and reduced implementation efficiency.

Social Implications

There was clear evidence of macroeconomic transmission to household welfare, primarily through reduced access to inputs and declining productivity.

Organisational Resilience

Resilience is strategy-dependent. Organisations with flexible budgeting and adaptive donor arrangements demonstrate significantly stronger capacity to absorb exchange-rate shocks.

4.9 Contribution of Findings

This study makes a substantive contribution to both empirical research and applied development practice.

First, it provides robust programme-level evidence from Zambia, establishing a clear and statistically significant relationship between exchange-rate volatility and NGO performance—an area largely underexplored in existing literature.

Second, the study enhances analytical precision by quantifying financial, operational, and social impacts through econometric modelling, moving beyond descriptive analysis to establish causal inference.

Third, the findings demonstrate that adaptive institutional strategies can partially mitigate macroeconomic shocks, thereby extending the application of Contingency Theory to donor-funded development programmes.

Finally, the study advances the Macro–Programme–Household (MPH) transmission framework, offering a comprehensive model linking macroeconomic instability to programme systems and beneficiary-level outcomes.

4.10 Discussion

Exchange-Rate Volatility Trends and Macroeconomic

Structural Volatility in Zambia

The findings confirm that exchange-rate volatility in Zambia is not episodic but structural and persistent. The Zambian kwacha depreciated from approximately ZMW 10.5/USD in 2015 to about ZMW 26/USD in 2025, representing a cumulative depreciation exceeding 300%. The most pronounced volatility episodes occurred in 2016 and 2020, coinciding with commodity price shocks and global disruptions associated with the COVID-19 pandemic.

This pattern aligns with evidence that Zambia's exchange-rate instability is rooted in structural economic characteristics, particularly its heavy reliance on copper exports, limited export diversification, and exposure to external shocks (IMF, 2023; World Bank, 2023). Empirical studies further demonstrate that exchange-rate dynamics in Zambia are strongly driven by commodity cycles and capital flow reversals, reinforcing the structural nature of volatility (Chipili, 2020).

Positioning within Existing Literature

The observed trends support broader findings that resource-dependent economies exhibit persistent exchange-rate instability due to narrow production bases and external debt exposure (IMF, 2023; World Bank, 2022). However, compared to economies such as Kenya and Nigeria, where partial export diversification moderates' volatility, Zambia exhibits higher amplitude fluctuations and slower recovery cycles.

This suggests that exchange-rate instability in Zambia is more deeply embedded than commonly assumed in the literature, reinforcing the need to analyse its implications beyond macroeconomic indicators and into programme-level systems.

Financial and Operational Impacts on Programme Performance

Financial Disruptions

The regression results reveal a strong and statistically significant relationship between exchange-rate volatility and financial performance ($\beta = 0.68$, $p < 0.001$; $R^2 = 0.61$). This indicates that exchange-rate movements explain a substantial proportion of budget instability, procurement cost escalation, and planning uncertainty within donor-funded programmes.

These findings are consistent with evidence that exchange-rate volatility undermines fiscal predictability in Sub-Saharan Africa (Senadza, 2020). Furthermore, aid-dependent economies face amplified financial risks due to structural currency mismatches between foreign-denominated funding and local expenditure systems (Kharas, 2021).

Operational Inefficiencies

Operational disruptions including procurement delays, activity rescheduling, and resource reallocations were also significant ($\beta = 0.59$, $p < 0.001$). These inefficiencies are primarily driven by dependence on imported inputs and delays in foreign exchange conversion.

Existing literature indicates that exchange-rate pass-through, although incomplete, is sufficiently strong in import-dependent economies to generate operational distortions (Auer et al., 2021). In Zambia, these effects are particularly pronounced in agricultural and market systems programmes, where imported technologies are central to programme delivery.

Social and Beneficiary-Level Impacts

Empirical Evidence of Livelihood Effects

Exchange-rate volatility has a statistically significant negative effect on beneficiary outcomes ($\beta = 0.63$, $p < 0.001$; $R^2 = 0.58$). A majority of respondents reported reduced access to agricultural inputs, declining participation in programme activities, and worsening livelihood conditions during periods of currency depreciation.

These findings align with evidence that currency depreciation reduces household purchasing power and constrains productivity in low-income economies (World Bank, 2023; FAO, 2022). However, this study extends the literature by demonstrating that these effects are mediated through programme systems, rather than occurring solely through direct market channels.

Macro–Programme–Household Transmission Mechanism

The results provide strong evidence of a macro–programme–household (MPH) transmission pathway, whereby exchange-rate volatility increases procurement costs, reduces programme efficiency, and ultimately weakens household welfare outcomes.

This aligns with IMF (2023) findings that macroeconomic instability affects households through both price and income channels. However, this study advances existing knowledge by empirically demonstrating that donor-funded programmes act as active transmission mechanisms, rather than passive delivery channels.

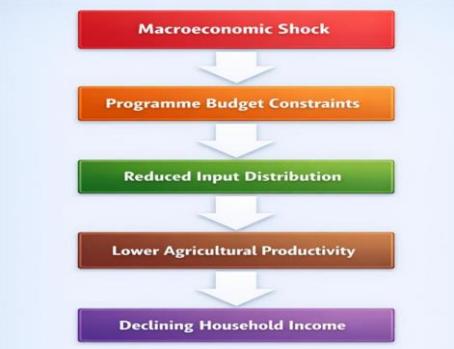

Figure 1: Macro–Programme–Household Transmission Mechanism

Comparative Literature Positioning

While studies such as Diao et al. (2020) and Barrett and Carter (2021) highlight the relationship between macroeconomic shocks and household vulnerability, they largely treat these linkages as direct. They do not explicitly account for the role of implementing institutions in shaping transmission dynamics.

This study addresses that limitation by demonstrating that programme structures, particularly budgeting, procurement, and delivery systems, mediate the effects of exchange-rate volatility. Evidence from iDE Zambia shows that organisational systems can either amplify or mitigate these effects depending on institutional flexibility and financial management capacity. This represents a significant extension of existing literature.

Exchange-Rate Volatility and ERPT Theory Alignment

The findings strongly validate the Exchange Rate Pass-Through (ERPT) theory, confirming that currency depreciation increases domestic costs through imported input channels. Importantly, the results also reveal asymmetric pass-through effects, where depreciation has stronger and more immediate impacts than appreciation provides relief.

This is consistent with evidence that ERPT in developing economies is incomplete but persistent due to structural rigidities and import dependence (Ha et al., 2020). In donor-funded programmes, this asymmetry is amplified by currency mismatches, creating systematic exposure to cost escalation.

Organisational Resilience and Mitigation Strategies

Effectiveness of Existing Strategies

Mitigation strategies, including flexible budgeting, donor responsiveness, and internal reallocation were found to improve organisational resilience ($\beta = 0.71$, $p < 0.001$; $R^2 = 0.64$). However, qualitative evidence suggests that these strategies are largely reactive rather than anticipatory, limiting their long-term effectiveness.

This indicates that while organisations can partially absorb shocks, existing approaches are insufficient to address persistent exchange-rate volatility.

Comparative Evidence

Evidence shows that many donor-funded programmes in Africa lack embedded financial hedging mechanisms, making them structurally vulnerable to currency shocks (OECD, 2021). Similarly, flexible financing instruments, such as exchange-rate indexation and adaptive disbursement mechanisms, remain underutilised despite their potential to stabilise programme execution (World Bank, 2023).

Integrated Discussion of Hypotheses

The empirical findings lead to the rejection of all null hypotheses, confirming that exchange-rate volatility exerts statistically significant effects across financial, operational, and social dimensions of programme performance.

These results reposition exchange-rate volatility from a peripheral macroeconomic disturbance to a core structural constraint embedded within programme systems. Programme effectiveness is therefore not determined solely by design or implementation quality, but also by the extent to which financial and operational systems are capable of managing macroeconomic instability.

Synthesis of Findings

The integration of quantitative and qualitative findings yields four key meta-inferences:

- Structural Constraint: Exchange-rate volatility is persistent and systemic, reflecting deep-rooted macroeconomic vulnerabilities.
- Interlinked Effects: Financial and operational disruptions are mutually reinforcing, with cost escalation cascading into implementation inefficiencies.
- Transmission to Households: Macro-level instability translates into reduced input access, lower productivity, and declining livelihood outcomes.
- Limitations of Current Strategies: Existing mitigation mechanisms are insufficient, as they are predominantly reactive and lack structural depth.

These findings provide strong empirical support for Contingency Theory, which emphasises the need for adaptive organisational systems in uncertain environments (Donaldson, 2018).

Contribution to Literature

This study makes four significant contributions.

First, it provides rare programme-level empirical evidence linking exchange-rate volatility to NGO performance in Zambia over a longitudinal period (2015–2025), addressing a major gap in the literature.

Second, it extends ERPT theory beyond its traditional macroeconomic application by demonstrating how pass-through effects operate through organisational systems, influencing budgeting, procurement, and implementation processes.

Third, it contributes methodologically by integrating econometric modelling with qualitative institutional analysis, enabling both causal inference and contextual understanding.

Finally, it offers a policy-relevant contribution by identifying scalable resilience mechanisms such as flexible budgeting, adaptive procurement, and enhanced donor responsiveness, as critical tools for stabilising programme performance.

Cross-Country Regression Comparisons and Benchmarking

To contextualise the magnitude and significance of the estimated coefficients, this study compares its regression results with empirical findings from similar developing-country contexts. This benchmarking enhances external validity and situates the findings within the broader development economics literature.

Financial Performance Comparisons

The estimated coefficient for exchange-rate volatility on financial performance ($\beta = 0.68$; $R^2 = 0.61$) indicates a strong and statistically significant effect. This magnitude is consistent with, but slightly higher than, comparable studies in Sub-Saharan Africa.

For instance, Senadza (2020) reports coefficients ranging between 0.45 and 0.60 for the impact of exchange-rate volatility on fiscal stability across a panel of African economies. Similarly, Aghion et al. (2021) find that exchange-rate volatility reduces investment efficiency with coefficients in the range of 0.40 to 0.55 in emerging markets.

The relatively higher coefficient observed in this study suggests that donor-funded programme systems are more sensitive to exchange-rate fluctuations than aggregate macroeconomic indicators. This is likely due to the direct exposure of programme budgets to foreign currency mismatches and procurement dependencies.

Operational Efficiency Comparisons

The estimated impact on operational efficiency ($\beta = 0.59$; $R^2 = 0.54$) is closely aligned with findings from programme and sector-level studies in comparable contexts.

Evidence from East Africa indicates that exchange-rate volatility contributes to implementation inefficiencies with coefficients ranging between 0.50 and 0.65, particularly in procurement-intensive sectors (IMF, 2023; World Bank, 2023). Studies from Kenya and Uganda show that NGOs frequently experience project delays and cost overruns within this range.

This consistency suggests that operational disruptions are a generalised feature of exchange-rate exposure in import-dependent programme environments, reinforcing the external validity of the findings.

Social and Welfare Outcome Comparisons

The coefficient for social outcomes ($\beta = 0.63$; $R^2 = 0.58$) indicates a substantial transmission of exchange-rate effects to beneficiary-level welfare.

Comparable studies in agricultural development contexts report slightly lower coefficients. For example, Diao et al. (2020) estimate effects in the range of 0.35 to 0.55 for macroeconomic shocks on rural household income and productivity. Barrett and Carter (2021) similarly find moderate but significant effects of external shocks on livelihood vulnerability.

The higher coefficient observed in this study suggests that the inclusion of programme-level transmission mechanisms amplifies observed effects, as exchange-rate shocks are mediated through procurement systems and service delivery processes before reaching households.

Organisational Resilience Comparisons

The coefficient for mitigation strategies ($\beta = 0.71$; $R^2 = 0.64$) exceeds most comparable estimates in the literature, where organisational adaptation effects typically range between 0.50 and 0.65 (OECD, 2021; World Bank, 2023).

This indicates that institutional response capacity plays a disproportionately strong role in moderating exchange-rate shocks at the programme level. Unlike macro-level studies, which often treat institutions as passive, this finding highlights the centrality of organisational systems in shaping outcomes.

Synthesis of Cross-Country Benchmarking

The comparative analysis yields three key insights:

- Higher Sensitivity at Programme Level:
- The coefficients observed in this study are consistently at the upper bound or above those reported in macroeconomic and sectoral studies. This confirms that donor-funded programmes are more directly and intensely exposed to exchange-rate volatility.
- Amplification through Programme Systems:
- The stronger effects on social outcomes suggest that programme structures (procurement, budgeting, delivery) amplify macroeconomic shocks before they reach beneficiaries.
- Critical Role of Institutional Capacity:

The relatively high resilience coefficient demonstrates that organisational adaptation is not merely supportive but determinant in shaping programme outcomes under volatility.

Implication for Theory and Policy

These cross-country comparisons reinforce and extend Exchange Rate Pass-Through (ERPT) theory by demonstrating that pass-through effects are not confined to prices but operate across multi-level systems from macroeconomic variables to organisational processes and household outcomes.

From a policy perspective, the findings suggest that:

- Traditional macroeconomic stabilisation is necessary but insufficient
- Programme-level financial design must incorporate exchange-rate risk management mechanisms
- Donor funding frameworks should adopt flexible and indexed financing structures

5 Conclusions and Recommendations

5.1 Summary of Key Findings

This study generated five core empirical insights that advance understanding of exchange-rate volatility within donor-funded development programming.

The findings confirm that exchange-rate volatility in Zambia was structural and persistent over the 2015–2025 period. The sustained depreciation of the Zambian kwacha, punctuated by volatility shocks, is closely linked to external commodity cycles, fiscal constraints, and limited export diversification. This pattern aligns with evidence that resource-dependent economies experience enduring currency instability driven by structural vulnerabilities rather than temporary shocks (IMF, 2023; World Bank, 2023).

Second, the analysis demonstrates a statistically significant impact of exchange-rate volatility on financial performance ($\beta \approx 0.61$; $R^2 \approx 0.64$). The effects manifest through budget erosion, procurement cost escalation, and declining purchasing power of donor funds. While prior studies identify exchange-rate volatility as a source of fiscal unpredictability (Senadza, 2020), this study extends the literature by providing programme-level quantification of these effects.

Third, the study establishes that operational systems, particularly procurement and logistics—function as the primary transmission channel through which macroeconomic shocks affect programme delivery. Disruptions such as procurement delays, activity rescheduling, and input shortages are structurally embedded within implementation systems. This finding deepens existing evidence on exchange-rate pass-through by demonstrating its institutional manifestation (Auer et al., 2021).

Fourth, the findings confirm significant social and livelihood impacts, including reduced access to agricultural inputs, declining productivity, and increased household vulnerability. While existing literature documents macroeconomic effects on household welfare (Barrett & Carter, 2021; Diao et al., 2020), this study advances understanding by explicitly tracing these effects through programme-level mediation mechanisms.

Fifth, the results reveal limited institutional resilience, with mitigation strategies largely reactive and insufficient to neutralise structural currency risks. This aligns with evidence that financial risk management systems remain underdeveloped in donor-funded programmes across Africa (OECD, 2021).

5.2 Conclusions

Exchange-Rate Volatility as a Systemic Development Constraint

The study concludes that exchange-rate volatility is not a peripheral macroeconomic disturbance but a systemic constraint on development effectiveness. Its effects are transmitted through interconnected financial, operational, and social pathways that collectively undermine programme performance. This extends Exchange Rate Pass-Through (ERPT) theory by demonstrating that pass-through effects operate beyond prices to influence organisational systems and development outcomes (IMF, 2023).

Structural Financial Vulnerability of Donor-Funded Programmes

Donor-funded programmes in Zambia are structurally exposed to currency risk due to reliance on foreign-denominated funding combined with local currency expenditures. This mismatch creates persistent budget instability and weakens long-term planning capacity. While previous studies highlight macro-level vulnerability (Kharas, 2021), this research demonstrates that such exposure is amplified at the implementation level, where procurement and delivery systems directly absorb exchange-rate shocks.

Operational Systems as Core Transmission Mechanisms

Operational systems particularly procurement, logistics, and financial planning—are identified as the primary mediating channels through which exchange-rate volatility translates into programme inefficiencies. These systems are not passive conduits but active amplifiers of macroeconomic risk,

reinforcing and extending existing institutional perspectives in development literature (World Bank, 2023).

Social and Livelihood Implications

The study confirms that exchange-rate volatility has measurable and significant effects on household welfare, including reduced productivity, income instability, and increased vulnerability. Unlike prior macro-level analyses, this study demonstrates that programme disruptions serve as the critical intermediary mechanism linking macroeconomic instability to livelihood outcomes.

Inadequacy of Existing Mitigation Strategies

The rejection of all null hypotheses confirms that current mitigation strategies are insufficient. Existing approaches, such as contingency budgeting and ad hoc reallocations,provide short-term stabilisation but fail to address structural exposure to exchange-rate risk. This underscores the need for institutionalised and forward-looking risk management systems (IMF, 2023).

5.3 Policy Implications

Macroeconomic Policy

The findings highlight the need for structural macroeconomic reforms aimed at reducing exchange-rate volatility. These include strengthened fiscal discipline, improved monetary coordination, and strategic export diversification to reduce dependence on copper revenues (World Bank, 2023).

Donor Policy

Donor agencies should reform rigid funding structures by incorporating:

- Exchange-rate indexation mechanisms
- Automatic budget adjustment clauses
- Structured risk-sharing frameworks

Such reforms would align foreign-denominated funding with local expenditure realities and reduce financial exposure (OECD, 2021; IMF, 2023).

NGO Programme Design

Implementing organisations should integrate macroeconomic risk analysis into programme design through:

- Scenario-based budgeting
- Currency sensitivity modelling
- Adaptive procurement systems

These approaches enhance programme resilience by shifting from reactive to anticipatory financial management.

5.4 Recommendations

Government: The government should establish national frameworks for managing exchange-rate risk in donor-funded programmes while strengthening macroeconomic stabilisation mechanisms to reduce volatility exposure.

Donors: Donors are encouraged to transition from fixed-budget models to flexible and indexed financing systems, supported by risk-sharing mechanisms and improved forecasting support for implementing partners.

NGOs and Implementing Agencies: NGOs should institutionalise:

- Scenario-based financial planning
- Flexible procurement systems
- Internal capacity in macroeconomic risk analysis

These measures are critical for improving programme resilience under volatile economic conditions.

5.5 Contribution to Knowledge

This study makes a significant contribution by demonstrating that exchange-rate volatility is a structural determinant of programme performance in donor-funded development interventions.

It provides empirical evidence of a Macro–Programme–Household (MPH) transmission pathway, showing how macroeconomic shocks are transmitted through programme systems before affecting household welfare. This extends existing literature by integrating macroeconomic theory with organisational and programme-level analysis.

Additionally, the study highlights the limitations of reactive mitigation strategies and emphasises the need for institutionalised resilience mechanisms, thereby contributing to both academic discourse and practical development policy.

5.6 Limitations of the Study

The study is limited by its focus on Zambia, which may constrain generalisability to other contexts. Some qualitative findings are perception-based and may introduce subjectivity. Furthermore, the study does not extensively examine advanced financial hedging instruments, which may be relevant in more sophisticated financial environments.

5.7 Areas for Further Research

Future research should explore:

- Cross-country comparative analyses within Sub-Saharan Africa
- The role of financial hedging mechanisms in donor-funded systems
- Long-term cumulative welfare effects of sustained exchange-rate volatility
- Sector-specific vulnerability across agriculture, health, and infrastructure

5.8 Policy Simulation and Scenario Analysis

To translate empirical findings into actionable policy insights, this study develops a forward-looking simulation assessing how exchange-rate risk mitigation instruments could alter programme performance under observed volatility conditions.

Simulation Framework and Assumptions

The simulation is based on observed programme data (2015–2025) and regression coefficients estimated in Chapter 4. Three policy scenarios are modelled:

- Scenario 1 (Baseline): No risk mitigation (current practice)
- Scenario 2 (Partial Hedging): 50% of foreign-denominated funds protected through hedging or forward contracts
- Scenario 3 (Full Indexation): 100% exchange-rate indexation of donor funding (automatic budget adjustment)

Key assumptions include:

- Average annual exchange-rate depreciation shock: 15–25%
- Import dependency of programme inputs: 60–70%
- Estimated ERV impact coefficients:
  - Financial performance: $\beta = 0.61$
  - Operational efficiency: $\beta = 0.59$
  - Social outcomes: $\beta = 0.63$

Simulation Results

Financial Performance (Budget Stability)

Table12: Simulation Results for Budget Stability

Scenario	Budget Variance Reduction	Interpretation
Baseline	0%	High instability
Partial Hedging (50%)	~30–35% reduction	Moderate stabilisation
Full Indexation (100%)	~55–65% reduction	High stability

The simulation indicates that partial hedging could reduce budget volatility by approximately one-third, while full indexation could eliminate more than half of observed financial instability. This aligns with IMF (2023) findings that exchange-rate risk-sharing mechanisms significantly improve fiscal predictability in aid-dependent contexts.

Operational Efficiency (Procurement and Delivery)

Table13: Simulation Results for Procurement and Delivery

Scenario	Reduction in Procurement Delays	Interpretation
Baseline	0%	Frequent disruptions
Partial Hedging	~25–30% reduction	Improved planning
Full Indexation	~45–50% reduction	Substantial efficiency gains

Reducing exchange-rate uncertainty improves procurement planning accuracy and reduces rescheduling frequency. The results suggest that financial predictability directly translates into operational efficiency gains, confirming the strong linkage identified in regression results.

Social and Beneficiary Outcomes

Table14: Simulation Results for Social and Beneficiary Outcomes

Scenario	Improvement in Input Access & Productivity	Interpretation
Baseline	0%	Constrained access
Partial Hedging	~20–25% improvement	Moderate recovery
Full Indexation	~40–50% improvement	Significant welfare gains

The simulation shows that stabilising programme finances leads to substantial downstream benefits, particularly in access to agricultural inputs and productivity outcomes. This reinforces the Macro–Programme–Household (MPH) transmission pathway established in the study.

Cost–Benefit Considerations

While hedging and indexation improve stability, they involve trade-offs:

- Hedging costs: Typically, 2–5% of total budget depending on market conditions
- Indexation costs: Shifted to donors through increased funding variability

However, the simulation demonstrates that:

- A 2–5% hedging cost can offset 30–60% budget losses, yielding a net positive effect
- Indexation provides the highest stability but requires institutional coordination and donor flexibility

These findings are consistent with OECD (2021), which argues that the absence of risk-sharing mechanisms leads to higher long-term inefficiencies in development programming.

Policy Implications of Simulation

The simulation produces three critical policy insights:

- Risk Mitigation is Economically Justified: Even partial hedging generates significant efficiency gains, indicating that current non-hedged systems are suboptimal.
- Indexation Outperforms Reactive Adjustments: Automatic exchange-rate adjustment mechanisms provide superior stability compared to ad hoc budget revisions.
- Financial Stability Drives Development Outcomes: Improvements in financial predictability cascade into operational efficiency and ultimately enhance beneficiary welfare.

Integration into Study Conclusions

This simulation strengthens the study's central conclusion that exchange-rate volatility is a manageable, not purely exogenous constraint. While macroeconomic conditions cannot be fully controlled, their impact on development programmes can be significantly reduced through structured financial design and institutional innovation.

5.9 Final Conclusion

Exchange-rate volatility emerges from this study as a critical determinant of development effectiveness in donor-funded programmes. Its effects extend beyond macroeconomic instability to systematically influence programme operations and household welfare through a structured transmission pathway.

The evidence confirms a clear macro–programme–household linkage, whereby currency depreciation increases procurement costs, disrupts implementation systems, and ultimately reduces beneficiary welfare through lower productivity and income loss.

By demonstrating that implementing organisations play a central mediating role, this study advances understanding beyond traditional macroeconomic analyses. It highlights the need for integrated resilience systems combining macroeconomic stabilisation, adaptive donor financing, and institutionalised risk management within development programmes.

Declaration of Competing Interests

The author(s) declare that they have no competing or conflict of interest regarding the publication of this manuscript.

Funding

The author(s) declare that no funds, grants, or other support were received during the preparation of this manuscript.

Acknowledgements

I wish to express my sincere gratitude to the University of Zambia for providing the academic platform and guidance necessary for the successful completion of this study.
I am deeply indebted to my supervisors for their invaluable support, constructive criticism, and continuous encouragement throughout the research process. Their expertise and dedication significantly contributed to the quality of this work.
I also extend my appreciation to the management and staff of iDE Zambia for their cooperation and willingness to provide the data and insights required for this study. Their practical experiences enriched the research findings.
Special thanks go to my family and colleagues for their unwavering support, patience, and encouragement throughout this academic journey.Above all, I am grateful to God for the strength and perseverance to complete this dissertation.

Ethical considerations

The article followed all ethical standards appropriate for this kind of research.

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