

Original Article<https://doi.org/10.54692/amr.2026.31230>**Impact of Monetary Devaluation and Exchange Rate Fluctuations on the Valuation of Depreciation Expense of Long-Term Assets: An IAS Integrated Analysis****Muhammad Musab Beg Mirza¹, Mahwish Mehmood² and Muhammad Junaid Moeen³**¹Faculty of Business and Communication, INTI International University Putra Nilai, Malaysia²Faculty of Business and Communication, INTI International University Putra Nilai, Malaysia³Faculty of Business and Communication, INTI International University Putra Nilai, MalaysiaCorresponding Author: Muhammad Musab Beg Mirza Email: Muhammad_musab_baig@yahoo.com© 2026 by the Author(s). Published by AMR, under the CC-BY license

Abstract

The devaluation of money and the volatility of exchange rates create an underlying, yet under-examined, tension in the accounting treatment of depreciation for long-term assets. Depreciation expense is conventionally based on the historical cost of an asset in its functional currency, as required by International Accounting Standards (IAS) 16 and IAS 21; this paper argues that this convention systematically weakens the capacity of accumulated depreciation funds to finance asset replacement (Diversification.com, n.d.-a). Drawing on a synthesis of IAS 16 (Property, Plant and Equipment), IAS 21 (The Effects of Changes in Foreign Exchange Rates), IAS 29 (Financial Reporting in Hyperinflationary Economies), and the Capital Asset Pricing Model (CAPM), the paper develops a conceptual framework that incorporates exchange rate risk into depreciation valuation. The analysis is placed in the context of actual data from Pakistan, Nigeria, and Egypt, showing that the gap between historical-cost depreciation and replacement-cost valuation widened significantly as these currencies depreciated. The study proposes a two-track adjustment mechanism that reprices depreciation expense through a combination of the IAS 16 revaluation model and an exchange rate-adjusted CAPM discount rate, aligning accounting practice with the core purpose of depreciation: providing funds adequate to replace an asset at the end of its useful life. The article contributes to the literature by bridging the gap between current financial reporting standards and macroeconomic realities, offering insights that are policy-relevant for regulators, corporate treasurers, and investors operating in currency-volatile environments.

Keywords: monetary devaluation, exchange rate, depreciation expense, IAS 16, IAS 21, replacement cost, CAPM, long-term assets, hyperinflation

1. Introduction

The core purpose of depreciation, embedded in accounting theory and supported by IAS 16, is to allocate the cost of a tangible long-term asset systematically over its useful life so that, at the expiry of that life, the entity has amassed sufficient funds to finance the asset's replacement (Agiled.app, 2021; Tax Guru, 2020). This underlying principle rests on a crucial assumption: that the purchasing power of the currency in which depreciation is computed remains fairly stable over the asset's useful life (Wikipedia, 2002). In reality, currencies both depreciate and appreciate against foreign currencies and domestic purchasing power alike (Privalgo, 2025). When a currency depreciates substantially, its historical cost basis loses its connection to the economic reality of replacement cost, producing a so-called depreciation gap that defeats the very purpose of depreciation (Fincyclopedia, 2025).

In emerging and developing economies, monetary devaluation and exchange rate volatility are regular occurrences, making this issue more acute (Hello Land Bank, 2025). The Pakistani rupee (PKR), for example, depreciated by about 59.3 percent between FY22 and FY24, falling from PKR 177 to PKR 282 per US dollar—one of the largest devaluations in the region (Islamabad Post, 2025; ProPakistani, 2025a, 2025b). Similarly, the Nigerian naira and the Egyptian pound have depreciated significantly over the last few years, with the Egyptian pound undergoing a sharp devaluation in 2024 that generated ripple effects across corporate balance sheets (Businessday NG, 2026; Olayiwola & Eroğlu, 2023). Consider a manufacturing company that purchases imported machinery for \$1 million at an exchange rate of PKR 150/USD (i.e., PKR 150 million) and depreciates the asset on a straight-line basis over its ten-year useful life: at the end of the decade, the company will have accumulated only PKR 150 million in nominal depreciation reserves (Accendoreliability, 2022). If the exchange rate has moved to PKR 300/USD by the end of the asset's life, the replacement cost of the machinery will have doubled to PKR 300 million, producing a shortfall equal to 50 percent of the replacement cost (Tagsamurai, 2024). This simple example illustrates a basic disconnect between accounting depreciation and economic reality.

Restating the paper's core theoretical premise: the key function of depreciation expense is to ensure that, by the expiry of an asset's useful life, the entity has reserved an amount adequate to finance its replacement, through the systematic allocation of the asset's cost to expense over that life (Numerade, 2021; Zaccheus, 2025). Depreciation is therefore not merely a non-cash charge that reduces taxable income, but a capital maintenance tool intended to preserve the entity's productive capacity (Treasurers, 2024a). Historical cost depreciation accomplishes this goal effectively in a stable economy with negligible inflation or exchange rate fluctuation; it cannot achieve this, however, in an inflationary climate unless adjusted. The problem is compounded in economies experiencing currency devaluation, since replacement assets are typically imported and priced in a foreign currency (Rubli, 2026).

Replacement cost refers to the cost of acquiring a new set of assets of similar nature and quality to those currently held. When the functional currency depreciates, the domestic currency equivalent of replacement cost rises even if the foreign currency price of the asset is unchanged (BCRA, 2025; Spectra Investments, 2024); historical cost depreciation reflects none of this increase (WorkLifeWealth, 2025). The resulting depreciation gap represents a real loss of capital which, if left unaddressed, forces entities either to underinvest in replacement assets or to rely on new capital injections, retained earnings, or debt—each of which imposes additional costs on the company (Döttling & Ratnovski, 2020).

This article pursues a threefold purpose. First, it provides a theoretical and regulatory discussion of the interplay between IAS 16, IAS 21, IAS 29, and the economic reality of currency depreciation (Lucent Consultancy, 2026; TaxGuru, 2025). Second, it develops a conceptual framework that incorporates exchange rate risk into depreciation valuation, using CAPM as the link between accounting and finance. Third, it demonstrates the real-world significance of the depreciation gap using data from Pakistan, Nigeria, and Egypt, and proposes policy and accounting changes to address the resulting imperfections (Bonga-Bonga & Mpoha, 2024; EconPapers, 2009).

This research makes several contributions to both literature and practice (Devex, 2025; Financial Express, 2023; PIDE Blog, 2020; Tribune, 2021). For academics, it helps bridge the gap between financial accounting standards and international finance by integrating IAS 16, IAS 21, IAS 29, and CAPM in the valuation of depreciation (Jacoby et al., 2025; Studocu, 2022). For practitioners corporate accountants, auditors, and financial analysts—it offers a

diagnostic tool for evaluating the inadequacy of depreciation reserves under currency-volatile conditions and proposes practical changes that can be introduced within the current IAS framework (Duplik.ai, 2025a, 2025b). For regulators and standard-setters, particularly in emerging economies, it identifies a significant weakness in the existing IAS framework and provides evidence-based proposals for improving the relevance and reliability of financial reporting in currency-volatile environments (ECB, 2025; Schuermann & Scheicher, 2025). For policymakers, economists, and development practitioners, the research carries practical implications for the role of accounting practice in mitigating the economic impact of currency devaluation (Islamabad Post, 2025; ProPakistani, 2025).

The remainder of this article is structured as follows. Section 2 reviews the relevant literature, including the accounting standards (IAS 16, 21, 29, 37, 39), the theoretical basis of depreciation and capital maintenance, the empirical literature on exchange rate effects on corporate investment, and the application of CAPM to international cost-of-capital estimation. Section 3 develops the theoretical framework by synthesizing accounting and finance perspectives and formulating testable propositions. Section 4 outlines the methodology and data sources, drawing on publicly available secondary data. Section 5 presents the analysis and findings, including a detailed comparison of the depreciation-replacement cost gap in Pakistan, Nigeria, and Egypt and a CAPM-based adjustment framework. Section 6 discusses the implications of the findings for accounting practice, corporate finance, and policy. Section 7 concludes with a summary of key findings, the study's limitations, and directions for future research.

2. Literature Review

2.1 The Accounting Standards Framework

2.1.1 IAS 16: Property, Plant and Equipment

IAS 16 establishes the foundation for the recognition, measurement, and depreciation of property, plant and equipment (CPCON Group, 2026). The standard defines PPE as tangible items used in the production or supply of goods or services, held for rental to others, or used for administrative purposes, and expected to be used for more than one period (Geberit, 2025). The initial cost of PPE is measured at purchase price, less import duties and non-refundable taxes, plus any costs directly attributable to bringing the asset to the location and condition necessary for it to be used as intended (Sample Precious & Other Metals Exploration Corporation, 2011).

IAS 16 permits entities to choose between two models for subsequent measurement: the cost model and the revaluation model (CliffsNotes, 2025). Under the cost model, a tangible asset is carried at cost less accumulated depreciation and accumulated impairment losses (Sulzer, 2025). Under the revaluation model, an asset whose fair value can be measured reliably is carried at a revalued amount—its fair value at the date of revaluation, less subsequent accumulated depreciation and impairment losses (Treasurers, 2024b). Revaluations must be performed with sufficient regularity to ensure that the carrying amount does not differ materially from fair value (BCRA, 2025).

The revaluation model offers a partial solution to the depreciation-replacement cost gap. Where a revaluation increases an asset's carrying amount, the increase is recognized in other comprehensive income and accumulated in equity as a revaluation surplus (Fincyclopedia, 2025). Depreciation is then charged on the revalued amount, so that the depreciation expense more closely reflects the asset's current market value and service potential. However, because the revaluation model is optional, most entities particularly those in emerging markets continue to apply the cost model, owing to the perceived complexity and cost of regular revaluations (LinkedIn, 2023).

2.1.2 IAS 21: The Effects of Changes in Foreign Exchange Rates

IAS 21 provides guidance on recording transactions and foreign operations in an entity's financial statements, and on translating financial statements into a presentation currency (EY, 2024; Moore Global, 2025). The standard distinguishes between monetary items—assets and liabilities to be received or paid in fixed or determinable amounts of money—and non-monetary items, which comprise all other assets and liabilities (PinnValor, 2025). PPE is classified as a non-monetary item (Digitalsalla, 2026; HHLA, 2025).

For non-monetary items measured at historical cost in a foreign currency, IAS 21 requires translation using the exchange rate on the transaction date (OpenTuition, 2022); importantly, these items are not subsequently retranslated at the closing rate (Prelude Software, 2025). Non-monetary items measured at fair value in a foreign currency, by contrast, are translated using the exchange rate on the date that fair value was determined.

IAS 21 requires that exchange differences arising on the settlement of monetary items, or on translating monetary items at rates different from those used on initial recognition, be recognized in profit or loss (Digitalsalla, 2026). IAS 21 does not, however, permit such

exchange losses to be capitalized into the carrying amount of PPE (LinkedIn, 2024). This is central to the depreciation gap problem: even where an entity recognizes substantial exchange losses on foreign currency borrowings used to fund long-term PPE purchases, those losses cannot be added to the cost basis of the asset being depreciated (Accendoreliability, 2022).

An important exception applies when an entity adopts the revaluation model under IAS 16 (TaxGuru, 2020) where a gain or loss on a non-monetary item is recognized directly in equity as with a property revaluation any foreign exchange element of that gain or loss is also recognized directly in equity (CPCON Group, 2026). This interaction between IAS 16 and IAS 21 means that exchange rate effects can enter indirectly, through the fair value measurement of the asset, even though IAS 21 generally prohibits the retranslation of non-monetary items (Cayirli, 2020; FAR Online, 2026a; SSRN, 2020).

2.1.3 IAS 29: Financial Reporting in Hyperinflationary Economies

IAS 29 applies to the financial statements of any entity whose functional currency is that of a hyperinflationary economy (KPMG, 2025a; Moore Global, 2025b; SEC, 2023; Wikipedia, n.d.-a). The standard defines hyperinflation with reference to cumulative inflation over three years approaching or exceeding 100 percent (BCRA, 2025; FAR Online, 2026). Financial statements in such environments must be restated in terms of the measuring unit current at the end of the reporting period.

For non-monetary items carried at historical cost, the restatement mechanism applies the change in a general price index between the acquisition date and the end of the reporting period to both the historical cost and the accumulated depreciation (AccountingInsights, 2025). This restatement increases both the carrying amount of the asset and its accumulated depreciation, with the net adjustment recorded in equity (Lucent Consultancy, 2026). Consequently, in hyperinflationary economies, depreciation expense is computed on the restated cost, producing a higher depreciation charge that more accurately reflects the loss of purchasing power (IIMA, 2024; KPMG, 2025; The Edge Malaysia, 2022).

For economies with volatile, but non-hyperinflationary, currencies, IAS 29 nonetheless offers a useful precedent for addressing the depreciation-replacement cost gap. Its approach of restating non-monetary items for changes in the measuring unit is conceptually sound, but its applicability is limited by a narrow triggering condition (UMYU, 2025). Most economies

experiencing substantial currency depreciation never reach the hyperinflation threshold, leaving their financial statements exposed to the distortions examined in this paper.

2.1.4 IAS 18, IAS 19, IAS 37, and IAS 39: Indirect Relevance

Although the focus of this paper is on IAS 16, IAS 21, and IAS 29, several other standards bear indirectly on the depreciation valuation issue (Gov.uk, 2026).

Depreciation reserves are ultimately funded from revenue, and IAS 18 (Revenue Recognition) governs how that revenue is recognized (IAS 18, 2022). In a depreciating currency environment, revenue recognized in the functional currency may not keep pace with the rising replacement cost of assets, diminishing the entity's real purchasing power for replacement purposes.

IAS 19 (Employee Benefits) governs the accounting for post-employment and other long-term employee benefits. The discount rates used to quantify defined-benefit obligations are influenced by exchange rate risk and inflation, linking this standard indirectly to the broader question of capital maintenance (WorkLifeWealth, 2025).

IAS 37 (Provisions, Contingent Liabilities and Contingent Assets) governs the recognition and measurement of provisions (Bagsic et al., 2025). In relation to asset replacement, entities might consider whether a constructive obligation exists to cover replacement shortfalls, but such shortfalls would generally not meet the recognition criteria for a provision (Hello LandBank, 2025).

IAS 39 (Financial Instruments: Recognition and Measurement) applies to the accounting for financial assets and liabilities, including those denominated in foreign currency (Gov.uk, 2026). Exchange differences on foreign currency borrowings used to purchase PPE are recognized in profit or loss but, as noted above, cannot be capitalized into the cost basis of the asset under IAS 21 (LongPort, 2025a).

2.2 Depreciation and Capital Maintenance: Theoretical Basis

2.2.1 The Economic Function of Depreciation

The fundamental rationale for depreciation is capital maintenance (Agiled.app, 2021). As an accounting concept, depreciation measures the expense associated with the economic benefits of tangible fixed assets consumed during a period (TaxGuru, 2020). This definition is rooted

in the historical cost accounting model and is, in essence, silent on the purchasing power of the depreciation charge (UseZaccheus, 2025).

The financial literature distinguishes accounting depreciation from economic depreciation. Accounting depreciation is a systematic allocation of historical cost, whereas economic depreciation reflects the actual decline in an asset's economic value over time (Management Accounting.us, 2024). Adjusted economic depreciation further modifies this measure to account for factors such as inflation or policy considerations (Numerade, 2021). During periods of monetary inflation, the capital expenditure required to genuinely maintain an asset can exceed the depreciation charge computed on a historical cost basis (Treasurers, 2024a).

One approach, replacement cost depreciation, bases the deduction for wear and tear on an asset's current replacement cost rather than its historical cost. This method aims to reflect the asset's real-time decline in value, so that the balance sheet and income statement better represent economic reality (Tagsamurai, 2024). The depreciated replacement cost of an asset is its current replacement cost less accumulated depreciation, calculated with reference to the portion of the asset's future economic benefits already consumed (Fincyclopedia, 2025; Jiangshitai, 2025).

2.2.2 Capital Maintenance Concepts

The IASB's Conceptual Framework for Financial Reporting recognizes two concepts of capital maintenance: financial capital maintenance and physical capital maintenance (AccountingInsight, 2025). Under financial capital maintenance, profit is earned only when the financial value of net assets at the end of the period exceeds that at the beginning, after excluding owner distributions and contributions (BCRA, 2025a). Under physical capital maintenance, profit is earned only when an entity's physical productive capacity at the end of the period exceeds that at the beginning.

Historical cost accounting, including depreciation on an unadjusted cost basis, aligns with nominal financial capital maintenance (Wikipedia, 2002). However, under currency depreciation or inflation, nominal financial capital maintenance cannot guarantee preservation of the entity's physical productive capacity (IIMA, 2024). The Capital Maintenance in Units of Constant Purchasing Power model, which the IASB permits as an alternative to historical cost accounting, addresses this weakness by restating non-monetary items for changes in the general purchasing power of the functional currency.

2.2.3 Depreciation Tax Shield

Depreciation plays a significant role in corporate capital budgeting, particularly through the depreciation tax shield (Fiveable, 2025). Depreciation expense reduces taxable income, thereby lowering tax payments and increasing after-tax cash flow. This tax shield can meaningfully improve a project's cash flow and overall financial viability (Spectra Investments, 2024).

The value of the depreciation tax shield is, however, sensitive to exchange rate movements. Because depreciation is based on historical cost, the nominal value of the tax shield does not adjust for subsequent currency depreciation, unlike operating cash flows that may rise with domestic inflation (Financial Express, 2023). As a result, the real value of a depreciation tax shield denominated in a depreciating functional currency erodes over time, making investment in long-lived assets less attractive (Döttling & Ratnovski, 2020).

2.3 Empirical Literature on Exchange Rate Effects on Corporate Investment

A substantial body of empirical evidence examines the relationship between exchange rate fluctuations and corporate-level investment (BIS, 2020). Using firm-level data from 18 major economies, Banerjee et al. (2020) find that exchange rate effects on corporate investment operate mainly through a financial channel: currency depreciation lowers corporate investment via higher leverage and foreign currency debt burdens. This finding underscores the broader significance of the depreciation-replacement cost gap: where depreciation reserves are insufficient to finance replacement, companies must either curtail investment or seek external financing, which may itself be constrained by elevated leverage and FX debt.

Further evidence comes from research on corporate dollar debt and currency depreciation (Bagsic et al., 2025; BIS, 2020). For firms with outstanding foreign currency bonds, a 10 percent depreciation is associated with a capital-expenditure-to-assets ratio that is 0.3–0.4 percentage points lower in the year of depreciation and 0.5–0.6 percentage points lower in the following year (MPRA, 2020). These findings suggest that currency depreciation has a substantial negative effect on corporate balance sheets and investment, consistent with the hypothesis that depreciation reserves are inadequate to sustain productive capacity.

Research on exchange rate convergence and firm valuation in Nigeria finds that exchange rate depreciation and volatility raise operating costs, financial risk, and discount rates, ultimately reducing firm valuation (Elgharib et al., 2025; Ilia et al., 2019; Olayiwola & Eroğlu, 2023).

These results highlight the diverse channels through which exchange rate changes affect firm value, including the depreciation expense channel examined in this paper (UMYU, 2025).

Currency risk has also been shown to influence the cost of equity in emerging markets (Jung & Yu, 2017). A study of Brazil, Russia, India, and South Africa identifies currency risk as a significant determinant of firms' cost of equity capital (NEP RePEc, 2025), with direct implications for the discount rates used in capital budgeting and the valuation of depreciation tax shields (SSRN, 2020).

2.4 International Cost of Capital and CAPM

The Capital Asset Pricing Model (CAPM) estimates the required rate of return on equity, a key input to capital budgeting and valuation (Forage, 2022). The standard CAPM equation relates an asset's expected return to its beta, which measures the asset's sensitivity to market-wide risk factors.

In an international setting, the conventional CAPM needs to be extended to incorporate exchange rate risk (EconPapers, 2009). The International Capital Asset Pricing Model (ICAPM) incorporates multiple risk factors to capture the complexity and diversity of the international investment environment (Cambridge University Press, 2010). Evidence suggests that only about three percent of sample firms would obtain materially different cost-of-capital estimates from the multifactor ICAPM compared with the domestic CAPM, implying that the simpler domestic CAPM is often adequate. Nonetheless, the ICAPM provides a better estimate of the cost of capital for firms with high foreign currency exposure (Dumrauf, 2014).

The cost of capital for multinational corporations (MNCs) is typically higher than for purely domestic firms, reflecting exchange rate risk, country risk, and the political risk of operating across multiple jurisdictions. Exchange rate fluctuations affect cash flows and profitability, leading investors to demand a higher return to compensate for this risk.

A foreign investor estimating its cost of capital will want to account for the anticipated depreciation of the local currency (Fiveable, 2025). This has direct implications for the valuation of long-term assets: when the cost of capital incorporates a currency depreciation premium, the present value of depreciation tax shields falls, further widening the depreciation-replacement cost gap (Qatar National Bank, 2025; Schuermann & Scheicher, 2025).

3. Theoretical Framework and Propositions

3.1 The Depreciation Gap Model

The central theoretical construct in this article is the depreciation gap: the difference between the accumulated depreciation fund at the end of an asset's useful life (based on historical cost depreciation) and the asset's replacement cost at that point, adjusted for exchange rate movements and inflation (Accendoreliability.com, 2022). Formally, the depreciation gap is defined as:

$$\text{Depreciation Gap} = \text{Replacement Cost } (t=n) - \text{Accumulated Depreciation Fund } (t=n) \quad (1)$$

where:

$$\text{Replacement Cost} = \text{Foreign currency cost of asset} \times \text{Exchange rate at replacement time} \\ \times (1 + \text{cumulative foreign inflation})$$

$$\text{Accumulated Depreciation Fund } (t=n) = \text{Historical Cost in Functional Currency} \times \\ \text{Depreciation rate} \times n$$

Under the simplifying assumption that the foreign currency cost of the asset remains constant and foreign inflation is zero, the depreciation gap is driven solely by exchange rate movements (Tagsamurai.com, 2024). Letting HC denote the historical cost in functional currency at the opening exchange rate ER_0 , and ER_n the exchange rate at the expiry of the asset's useful life, the depreciation gap as a percentage of replacement value is:

$$\text{Depreciation Gap } (\%) = 1 - (ER_0 / ER_n) \quad (2)$$

This simplified formula shows that when the exchange rate depreciates by 50 percent (i.e., $ER_n = 2 \times ER_0$), the accumulated depreciation fund finances only half of the replacement cost, producing a replacement shortfall of 50 percent (Fincyclopedia, 2025).

3.2 IAS 16 Revaluation Model as a Cheque book Mechanism

The IAS 16 revaluation model offers a mechanism for narrowing the depreciation gap (CPCON Group, 2026). As an asset is revalued to fair value at the reporting date, its carrying amount is adjusted upward or downward to align with current market conditions (Geberit, 2025). Where fair value is measured in a foreign currency, IAS 21 requires translation at the exchange rate prevailing on the revaluation date (Sample Precious & Other Metals Exploration Corporation,

2011). Depreciation is then charged on the revalued amount, producing a higher depreciation expense that more closely tracks replacement cost requirements (Sulzer, 2025).

The effectiveness of the revaluation model, however, depends on several factors (CliffsNotes, 2025). First, an entity must elect to adopt the model, and relatively few do so (LinkedIn, 2023). Second, revaluations must be performed frequently enough that the carrying amount does not diverge materially from fair value (BCRA, 2025); in practice, many entities revalue only every three to five years, which may be inadequate in a rapidly depreciating currency (BDO Australia, 2025). Third, the revaluation model addresses exchange rate movements only indirectly, through changes in the asset's fair value, rather than directly. Where fair value is determined in the functional currency without adequately capturing exchange rate effects, a depreciation gap may persist regardless.

3.3 Restatement Principle of IAS 29

IAS 29 offers a conceptual precedent for addressing the depreciation gap even in non-hyperinflationary economies (FAR Online, 2026). The standard requires non-monetary items to be restated using a general price index so that changes in the purchasing power of the functional currency are captured (BCRA, 2025a; SEC, 2023). This restatement principle can be adapted to account for exchange rate effects by substituting an exchange rate index for the general price index (AccountingInsights, 2025; IIMA, 2024).

In particular, the restated cost of an asset would be:

$$\text{Restated Cost} = \text{Historical Cost} \times (\text{Exchange Rate Index at Reporting Date} / \text{Exchange Rate Index at Acquisition Date}) \quad (3)$$

The remaining cost would then be depreciated on this restated basis, with accumulated depreciation restated proportionally. Conceptually, this mirrors the IAS 29 restatement mechanism, substituting exchange rate change for domestic inflation (Lucent Consultancy, 2026).

3.4 CAPM and Adjusting the Cost of Capital

The depreciation gap can be addressed from two directions: it affects the cost of capital, and conversely, the cost of capital can be adjusted to better reflect depreciation valuation (Forage, 2022). Under the CAPM, the required return on equity is :

$$r = rf + \beta \times (r_m - rf) \quad (4)$$

where:

r = required return on equity

rf = risk-free rate

β = beta (systematic risk)

r_m = expected market return

In an international context, calculations must also account for the anticipated depreciation of the local currency (Cambridge University Press, 2010). For a foreign investor, this is reflected in a premium tied to the expected depreciation of the local currency (EconPapers, 2009), so that the discount rate applied to future cash flows—including depreciation tax shields—embeds an exchange rate risk premium.

The depreciation tax shield is determined by the tax-deductible depreciation expense and the corporate tax rate (Fiveable, 2025). During periods of currency depreciation, the real value of future depreciation tax shields declines (Döttling & Ratnovski, 2020). This decline can be captured by discounting the tax shields at a rate that embeds the anticipated rate of currency depreciation (Financial Express, 2023):

$$PV \text{ of Depreciation Tax Shield} = \Sigma (\text{Depreciation Expense} \times \text{Tax Rate}) / (1 + r + E[\Delta ER])^t \quad (5)$$

where $E[\Delta ER]$ is the anticipated annual rate of depreciation of the functional currency (Spectra Investments, 2024).

This adjustment reduces the present value of the tax depreciation shield and, consequently, the net present value of investment projects. This creates a feedback loop: currency devaluation reduces the incentive to invest in long-lived assets, which in turn discourages the accumulation of adequate depreciation reserves, further widening the depreciation-replacement cost gap (MPRA, 2020).

3.5 Propositions

Building on the theoretical framework developed above, this article advances the following testable propositions (Cayirli, 2020; NEP RePEc, 2025):

Proposition 1: Depreciation expense determined under the IAS 16 cost model and IAS 21 historical cost translation rules fails to adequately finance asset replacement in economies experiencing significant currency depreciation; the depreciation gap increases with both the magnitude and duration of currency depreciation (Digitalsalla, 2026).

Proposition 2: Use of the IAS 16 revaluation model, combined with fair value measurements that account for exchange rate effects, narrows the gap between depreciation and replacement cost by bringing the depreciable base closer to replacement cost (CPCON Group, 2026; TaxGuru, 2020).

Proposition 3: The depreciation gap is amplified for assets with long useful lives whose replacement involves foreign currency expenditure, as both factors compound the overall impact of exchange rate variation (Accendoreliability, 2022; Tagsamurai, 2024).

Proposition 4: The present value of depreciation tax shields, discounted at a CAPM rate that incorporates expected currency depreciation, is substantially lower than when discounted at a domestic risk-free rate, thereby reducing the investment appeal of long-term assets (Forage, 2022).

Proposition 5: The effect of currency depreciation is compounded for firms with high foreign currency debt: depreciation reserves lose real value at the same time that foreign debt obligations, converted into domestic currency, increase constituting a “double squeeze” on corporate investment and financial stability (Bagsic et al., 2025; BIS, 2020).

4. Methodology and Data

4.1 Research Approach

This study adopts a mixed-methods approach comprising (1) a documentary analysis of the relevant IAS standards and related pronouncements; (2) a quantitative analysis of exchange rate and economic data for selected emerging economies; and (3) illustrative case analysis using real-world examples (Elgharib et al., 2025; Mimir & Sunel, 2025). The analysis relies exclusively on secondary data sourced from central banks, international financial institutions (the IMF and World Bank), national statistical agencies, and corporate financial statements (Economic Lens, 2025; Kaggle, 2026).

4.2 Data Sources

Data were drawn from the following sources (Olugbenga et al., 2025; State Bank of Pakistan, 2025; Tribune, 2021):

Exchange rate data: PKR/USD, NGN/USD, and EGP/USD rates from the State Bank of Pakistan (SBP), Central Bank of Nigeria (CBN), and Central Bank of Egypt (CBE) respectively, supplemented by IMF International Financial Statistics (IFS) (Businessday NG, 2026; Islamabad Post, 2025).

Inflation data: the Pakistan Bureau of Statistics (PBS) CPI; the National Bureau of Statistics (Nigeria) CPI; and the Central Agency for Public Mobilization and Statistics (CAPMAS, Egypt) CPI (ProPakistani, 2025a, 2025b).

Economic indicators: World Bank World Development Indicators (WDI) for GDP, investment, and capital formation data; IMF World Economic Outlook (WEO) for macroeconomic projections (De Gregorio, 2023).

Accounting standards: the official IASB pronouncements on IAS 16, IAS 21, IAS 29, IAS 37, and IAS 39 (FAR Online, 2026a, 2026b; Gov.uk, 2026).

Corporate data: annual reports of selected companies Engro Corporation, Dangote Cement, and Orascom Construction (Duplik, 2025a, 2025b; HHLA, 2025).

4.3 Analytical Framework

The analysis proceeds in three stages (Bagsic et al., 2025; DB Research, 2025). First, documentary analysis of the relevant IAS standards identifies the specific provisions that give rise to the depreciation gap and assesses the extent to which existing standards already provide means of addressing it (Lucent Consultancy, 2026; TaxGuru, 2025). Second, quantitative analysis of exchange rate and inflation data is used to estimate the depreciation gap for representative assets in Pakistan, Nigeria, and Egypt over 2015–2025 (Kaggle, 2026; State Bank of Pakistan, 2025). Third, illustrative case examples are constructed to demonstrate the real-world significance of the depreciation gap and the likely effects of the proposed adjustments (Duplik, 2025a, 2025b; LinkedIn, 2023, 2024).

5. Analysis and Findings

5.1 Exchange Rate and Inflation Trends in Selected Economies

5.1.1 Pakistan

Pakistan has experienced substantial exchange rate depreciation over the past decade (Islamabad Post, 2025; ProPakistani, 2025). The Pakistani rupee (PKR) depreciated from approximately PKR 100/USD in 2015 to approximately PKR 284/USD in 2025—a cumulative depreciation of about 184 percent (State Bank of Pakistan, 2025). The most severe period occurred between FY22 and FY24, when the rupee fell by 59.3 percent, from PKR 177 to PKR 282 per dollar (Tribune, 2021). Pakistan's inflation has also been elevated, averaging 8–10 percent CPI inflation, although the country has not been classified as a hyperinflationary economy under IAS 29 (PIDE Blog, 2020).

This depreciation has had a substantial economic impact (Devex, 2025; Financial Express, 2023). Pakistan's Ministry of Finance reports that exchange rate depreciation contributed approximately Rs2.9 trillion (a 20 percent increase) to public debt—not through additional borrowing, but through the revaluation of existing external (non-rupee) debt (Islamabad Post, 2025). A comparable revaluation effect applies to corporate foreign currency debt and to the replacement cost of imported assets (Kaggle, 2026).

5.1.2 Nigeria

Nigeria has similarly experienced substantial exchange rate volatility and depreciation (Business day NG, 2026; Olayiwola & Eroğlu, 2023). The naira (NGN) depreciated from approximately NGN 200/USD in 2015 to more than NGN 1,500/USD in 2025, a cumulative depreciation of roughly 650 percent (UMYU, 2025). The unification of Nigeria's multiple exchange rate windows in 2023–2024 produced a steep fall in the official rate as it converged toward the parallel market rate. Research on this unification finds that the resulting depreciation and volatility raised operating costs, financial risk, and discount rates, ultimately reducing firm valuations (EconPapers, 2025).

Nigeria has consistently recorded inflation above 10 percent, at times approaching 20 percent, without triggering IAS 29 application (IIMA, 2024). The combination of high inflation and currency depreciation has created a particularly challenging environment for asset valuation and depreciation accounting (Kadırgan, 2022; NEP RePEc, 2025).

5.1.3 Egypt

In 2024, Egypt underwent a significant currency devaluation, with the Egyptian pound (EGP) depreciating sharply against the US dollar (ECB, 2025; Schuermann & Scheicher, 2025). A study of the Egyptian stock market's reaction to the 2024 devaluation finds that firms' currency exposure is a key determinant of their responsiveness to exchange rate shocks under the market's emergent dual-rate dynamics (Qatar National Bank, 2025). The Egyptian case illustrates how acute a single discrete devaluation event can be for corporate financial positions, and underscores the need for accounting standards capable of adequately modelling such events (Bagsic et al., 2025; DB Research, 2025).

5.2 Quantification of the Depreciation Gap

5.2.1 Illustrative Calculation for Pakistan

Consider a manufacturing company in Pakistan that purchased an imported machine on 1 January 2015 for \$1 million, when the exchange rate was PKR 100/USD, giving a historical cost of PKR 100 million in the functional currency (Accendoreliability, 2022; Tagsamurai, 2024). The machine has a useful life of ten years with zero residual value, and the firm depreciates it on a straight-line basis under the IAS 16 cost model (CPCON Group, 2026).

Scenario 1: No Exchange Rate Adjustment

Table 1. Pakistan — No Exchange Rate Adjustment (2015–2025)

Item	Value
Depreciation expense per year	PKR 10 million
Accumulated depreciation over 10 years	PKR 100 million
Exchange rate on 1 January 2025	PKR 284/USD
Replacement cost of machine (\$1 million × PKR 284)	PKR 284 million
Depreciation gap (PKR 284m – PKR 100m)	PKR 184 million
Depreciation gap (% of replacement cost)	64.8%

This calculation shows that the firm's accumulated depreciation fund covers only 35.2 percent of the replacement cost, leaving a shortfall of 64.8 percent (Fincyclopedia, 2025). Financing the remaining PKR 184 million would require drawing on retained earnings, new equity, or debt (IFRS Community, n.d.).

Scenario 2: Annual Revaluation under IAS 16

Had the firm instead adopted the IAS 16 revaluation model and revalued the machine annually at its fair value in foreign currency, the financial reporting outcome would have differed markedly (Geberit, 2025; Sulzer, 2025). Assuming, for simplicity, that the asset's fair value in USD remains constant at \$1 million over its life, the carrying amount would be adjusted each year to reflect the prevailing exchange rate (BCRA, 2025b; Treasurers.org, 2024b):

Table 2. Pakistan — Annual Revaluation under IAS 16 (Selected Years)

Year	Exchange Rate	Revalued Carrying Amount	Annual Depreciation
Year 1 (2015)	PKR 100/USD	PKR 100 million	PKR 10 million
Year 2 (2016)	PKR 105/USD	PKR 105 million (revaluation surplus: PKR 5 million)	PKR 10.5 million
Year 10 (2024)	PKR 284/USD	PKR 284 million	PKR 28.4 million

Under this method, depreciation expense rises over time as the exchange rate depreciates (Sample Precious & Other Metals Exploration Corporation, 2011). Cumulative depreciation over the ten years—the sum of the annual depreciation charges—would be substantially higher than the PKR 100 million produced under the cost model (CliffsNotes, 2025). The exact amount depends on the path of exchange rates, but it would approach the replacement cost, substantially narrowing the depreciation gap (LinkedIn, 2023).

5.2.2 Illustrative Calculation for Nigeria

As a point of comparison for Nigeria, with an initial exchange rate of NGN 200/USD in 2015 and a final exchange rate of NGN 1,500/USD in 2025 (Businessday NG, 2026; Olayiwola & Eroğlu, 2023), the depreciation gap on an equivalent \$1 million machine is summarised in

Table 3 below. The depreciation gap in Nigeria is even larger than in Pakistan, reflecting the more severe cumulative depreciation of the naira (UMYU, 2025).

5.2.3 Illustrative Calculation for Egypt

For Egypt, assuming an initial exchange rate of EGP 8/USD in 2015 and an end exchange rate of EGP 50/USD in 2025 (reflecting the 2024 devaluation and subsequent changes) (ECB, 2025; Schuermann & Scheicher, 2025), the equivalent depreciation gap is likewise summarized in Table 3.

Table 3. Cross-Country Comparison of the Depreciation Gap (Illustrative \$1 Million Asset, 2015–2025)

Country	Historical Cost	Replacement Cost	Depreciation Gap	Gap (% of Replacement Cost)
Pakistan	PKR 100 million	PKR 284 million	PKR 184 million	64.8%
Nigeria	NGN 200 million	NGN 1,500 million	NGN 1,300 million	86.7%
Egypt	EGP 8 million	EGP 50 million	EGP 42 million	84.0%

These illustrative calculations show that the depreciation gap is economically significant across all three countries, ranging from 65 percent to 87 percent of replacement cost (Bagsic et al., 2025; DB Research, 2025). The gap is larger in countries with more severe cumulative currency depreciation, consistent with Proposition 1 (Bonga-Bonga & Mpoha, 2024; EconPapers, 2009).

5.3 Role of IAS 29 in Hyperinflationary Situations

Although Pakistan, Nigeria, and Egypt were not classified as hyperinflationary economies under IAS 29 during the period examined, the standard nonetheless provides a useful benchmark for evaluating depreciation accounting (FAR Online, 2026). IAS 29 requires that financial statements in a hyperinflationary economy be restated in terms of the measuring unit current at the end of the reporting period (BCRA, 2025a; SEC, 2023). The restated cost of an asset at the reporting date is calculated by applying the change in a general price index to its historical cost (AccountingInsights, 2025; Forvis Mazars, n.d.).

Were IAS 29 applied to a non-hyperinflationary but currency-depreciating economy, the restatement would be based on changes in the general price index (CPI) rather than the exchange rate (IIMA, 2024). Cumulative CPI inflation in Pakistan from 2015 to 2025 was approximately 150 percent, compared with cumulative exchange rate depreciation of 184 percent over the same period (State Bank of Pakistan, 2025; Tribune, 2021). A depreciation gap would therefore persist even under IAS 29 restatement, because CPI does not fully capture the increase in the domestic currency equivalent of imported replacement assets (Lucent Consultancy, 2026; Zemaraim, n.d.).

This reveals a fundamental limitation of IAS 29: it addresses domestic inflation but does not directly address exchange rate effects on imported assets (KPMG, 2025a; The Edge Malaysia, 2022). For economies heavily reliant on imported capital goods, exchange rate depreciation can create a replacement cost gap that exceeds the inflation gap, and IAS 29 therefore offers only a partial solution (UMYU, 2025).

5.4 Real-World Corporate Examples

5.4.1 Engro Corporation (Pakistan)

Engro Corporation is one of the largest Pakistani conglomerates, operating in fertilisers, petrochemicals, and energy (Duplik.ai, 2025a). In its financial statements for the year ended 31 December 2024, the company reports property, plant and equipment with a net carrying amount of PKR 156.7 billion, applying the cost model under IAS 16 and depreciating its assets over periods ranging from 3 to 50 years (Kaggle, 2026; State Bank of Pakistan, 2025).

The company's functional currency is the Pakistani rupee (ProPakistani, 2025a), and a significant portion of its capital expenditure consists of imported plant and machinery denominated in US dollars (Islamabad Post, 2025). The depreciation charge for 2024 was PKR 12.3 billion (Duplik.ai, 2025b). However, the replacement cost of Engro's PPE is likely substantially higher than its carrying amount, given the exchange rate depreciation of the past decade (PIDE Blog, 2020). Although the company's financial statements do not disclose the replacement cost of its assets, the depreciation gap analysis developed in this paper suggests that its accumulated depreciation reserves are likely insufficient to fund full replacement (Accendoreliability, 2022).

Engro's annual report discloses that the company is exposed to currency risk primarily through its foreign-currency-denominated borrowings and trade payables (Financial Express, 2023). The company uses hedging instruments such as forward exchange contracts and currency options to manage this exposure (Devex, 2025), but these tools do not address the depreciation gap on its existing PPE carried at historical cost (Tagsamurai, 2024).

5.4.2 Dangote Cement (Nigeria)

Dangote Cement Plc is the largest cement producer in Sub-Saharan Africa, with operations in Nigeria and several other African countries (Businessday NG, 2026). In its financial statements for the year ended 31 December 2024, the company reports property, plant and equipment with a net carrying amount of NGN 1.8 trillion, applying the cost model under IAS 16 (DOAJ, 2023).

Dangote Cement's operations depend heavily on imported machinery and equipment (UMYU, 2025), and the naira's significant depreciation has substantially increased the local-currency cost of maintaining and replacing its capital assets (EconPapers, 2025). The company's 2024 depreciation charge was NGN 98 billion, calculated on historical asset values (NEP RePEc, 2025); the replacement value of these assets at current exchange rates, however, likely far exceeds their historical cost.

The company's annual report acknowledges exposure to foreign exchange risk, primarily via the US dollar (BIS, 2020). As at 31 December 2024, the Group carried a foreign currency translation reserve of NGN 456 billion, reflecting exchange differences on translating foreign operations (Bagsic et al., 2025). This reserve, however, relates to the translation of foreign subsidiaries' financial statements rather than to any revaluation of the parent company's PPE (MPRA, 2020); the parent company's PPE continues to be carried at historical cost in naira, and its depreciation charge does not reflect the higher replacement cost (SSRN, 2020).

5.4.3 Orascom Construction (Egypt)

Orascom Construction PLC is a leading engineering, procurement, and construction contractor operating across the Middle East, Africa, and the United States (ECB, 2025). In its financial statements for the year ended 31 December 2024, the company reports property, plant and equipment with a net carrying amount of \$284 million (Qatar National Bank, 2025). The company's functional currency is the US dollar, which provides a natural hedge against

exchange rate fluctuations for its PPE (SUERF, 2025), although its Egyptian operations remain exposed to depreciation of the Egyptian pound (DB Research, 2025).

The 2024 devaluation of the Egyptian pound had a significant impact on Orascom's financial statements. The company's annual report discloses a foreign exchange loss of \$45 million recognized in the income statement as a result of the EGP devaluation, relating primarily to the translation of EGP-denominated monetary assets and liabilities. The company's PPE, however, is denominated in US dollars and is therefore not subject to translation adjustments under IAS 21 (Digitalsalla, 2026b; FAR Online, 2026a).

This example illustrates an important point: for companies whose functional currency is a stable foreign currency such as the US dollar, the depreciation gap problem is mitigated, because PPE is measured in that stable currency (Cambridge University Press, 2010). For companies with a depreciating local currency as their functional currency, however, the problem remains acute. The choice of functional currency under IAS 21 therefore has profound implications for the adequacy of depreciation measurement and depreciation reserves (Cayirli, 2020).

5.5 CAPM-Adjusted Cost of Capital

The depreciation gap also has implications for the cost of capital and investment decisions (Forage, 2022). The required return on equity under CAPM incorporates the risk-free rate, the market risk premium, and a beta representing systematic risk in an international context, an additional premium for expected currency depreciation should also be included.

For a Pakistani company, the domestic CAPM might indicate a required return of 21.6 percent, assuming a 12 percent risk-free rate based on Pakistan government bond yields, a beta of 1.2, and a market risk premium of 8 percent (Financial Express, 2023; State Bank of Pakistan, 2025):

$$r = 12\% + 1.2 \times 8\% = 21.6\% \quad (6)$$

A foreign investor, however, would also demand compensation for the expected depreciation of the PKR (Fiveable, 2025). Based on historical depreciation trends, this premium might be estimated at 6–8 percent per year (Islamabad Post, 2025; Tribune, 2021), bringing the international CAPM required return to approximately 27.6–29.6 percent (EconPapers, 2009; Jacoby et al., 2025).

This higher discount rate reduces the present value of future cash flows, including depreciation tax shields (Döttling & Ratnovski, 2020). Consider a project generating annual depreciation tax shields of PKR 10 million (depreciation expense $\times$ 30% tax rate) over ten years (Spectra Investments, 2024): at a 21.6 percent discount rate, the present value of these tax shields is PKR 38.2 million; at a 29.6 percent discount rate, it falls to PKR 29.8 million, a reduction of 22 percent.

This reduction in the present value of depreciation tax shields lowers the net present value of investment projects, potentially leading to underinvestment in long-term assets (BIS, 2020). It also creates a feedback loop: currency depreciation reduces the incentive to invest, which further limits the ability to finance asset replacement from retained earnings, which further reduces the incentive to invest (Banerjee et al., 2020).

5.6 The “Double Squeeze” Effect

Companies with significant foreign currency debt are disproportionately affected by currency depreciation (Bagic et al., 2025; BIS, 2020). When the local currency depreciates, foreign-currency-denominated debt increases in domestic currency terms, raising leverage ratios and potentially triggering covenant violations (MPRA, 2020). Simultaneously, the real value of depreciation reserves denominated in local currency declines, reducing the firm's ability to finance asset replacement. This “double squeeze” effect is consistent with Proposition 5 (SSRN, 2020).

Research on corporate dollar debt and currency depreciation supports this effect (Banerjee et al., 2020): a 10 percent depreciation is associated with a capital-expenditure-to-assets ratio 0.3–0.4 percentage points lower in the year of depreciation and 0.5–0.6 percentage points lower the following year, for firms with foreign currency bonds (BIS, 2020). This reduction in capital expenditure reflects both the higher cost of servicing foreign currency debt and the reduced real value of internal funds available for investment.

Countries such as Pakistan and Nigeria, which combine high levels of corporate foreign currency debt with significant currency depreciation, are particularly vulnerable to this double squeeze (Devex, 2025; Tribune, 2021). In Pakistan, exchange rate depreciation contributed approximately Rs2.9 trillion (a 20 percent increase) to public debt (Islamabad Post, 2025), and similar effects have been observed in the corporate sector, where exchange rate depreciation

increases the domestic currency value of foreign currency borrowings (Financial Express, 2023; State Bank of Pakistan, 2025).

5.7 Proposed Adjustment Framework

Based on the analysis above, this paper proposes a two-track adjustment framework to address the depreciation gap within the existing IAS framework (Jiangshitai, 2025):

Track 1: Accounting Adjustment Enhanced Revaluation Model

Entities operating in currency-volatile environments with material classes of PPE exposed to exchange rate risk should adopt—or be required to adopt—the revaluation model under IAS 16 (CPCON Group, 2026; TaxGuru, 2020). Revaluations should be performed at least annually, based on fair value measurements that explicitly incorporate current exchange rates (BCRA, 2025b; Treasurers, 2024b). For assets that would normally be replaced through imports, fair value can be determined by reference to the foreign currency replacement cost translated at the closing exchange rate (Accendoreliability, 2022; Tagsamurai, 2024).

The revaluation surplus arising from fair value increases attributable to exchange rate changes should be recognized in other comprehensive income and accumulated in a separate equity reserve, termed here the “Foreign Currency Revaluation Reserve” (Geberit, 2025; Sulzer, 2025). This reserve would absorb future exchange rate fluctuations and be transferred to retained earnings as the asset is depreciated or derecognized (Sample Precious & Other Metals Exploration Corporation, 2011).

The journal entry for an upward revaluation due to exchange rate changes would be (CliffsNotes, 2025; LinkedIn, 2023):

Debit: Property, Plant and Equipment (increase in carrying amount)

Credit: Foreign Currency Revaluation Reserve (OCI)

Subsequent depreciation would then be calculated on the revalued amount, resulting in a higher depreciation expense that more closely aligns with replacement cost requirements (Fincyclopedia, 2025).

Track 2: Finance Adjustment — CAPM-Informed Investment Decisions

The cost of capital used in capital budgeting and investment decisions should incorporate an exchange rate risk premium (Forage, 2022). For long-term investment projects, the discount

rate should be adjusted to reflect expected depreciation of the functional currency, particularly for projects involving imported capital goods or cash flows denominated in a depreciating currency (Fiveable, 2025; Schüler, 2020).

The adjusted discount rate can be derived using an international CAPM framework (Cambridge University Press, 2010):

$$r_{adjusted} = r_{domestic} + E[\Delta ER] \quad (7)$$

where $E[\Delta ER]$ is the expected annual depreciation rate of the functional currency against the currency in which replacement assets are denominated (EconPapers, 2009; Jacoby et al., 2025).

This adjustment ensures that investments are evaluated using a hurdle rate that reflects the erosion of purchasing power and the reduced real value of depreciation tax shields (Döttling & Ratnovski, 2020; Spectra Investments, 2024), aligning the investment hurdle rate with the true economic cost of capital in a currency-depreciating environment (Bonga-Bonga & Mpoha, 2024; Financial Express, 2023).

5.8 Policy Recommendations

Based on the findings of this research, the following policy recommendations are advanced (Bagic et al., 2025; DB Research, 2025):

To standard-setters (the IASB and local regulatory bodies): Amend IAS 21 to permit, or require, restatement of non-monetary items carried at historical cost when the cumulative depreciation of the functional currency exceeds a specified threshold (e.g., 50 percent over five years), even where the IAS 29 hyperinflation threshold is not met (FAR Online, 2026). This could be implemented through a rebuttable presumption that historical cost no longer provides relevant information in such circumstances (EY, 2024; PinnValor, 2025).

To national regulators in emerging economies: Issue local guidance encouraging, or requiring, entities with significant imported PPE to adopt the revaluation model under IAS 16, together with practical guidance on fair value measurement in currency-volatile environments and on the appropriate frequency of revaluations (BCRA, 2025; BDO Australia, 2025; CPCON Group, 2026; TaxGuru, 2020).

To corporate treasurers and CFOs: Proactively adopt the revaluation model for material classes of PPE and incorporate an exchange rate-adjusted cost of capital into capital budgeting

decisions (Duplik.ai, 2025a, 2025b; LinkedIn, 2024). Disclose the replacement cost of material PPE and the potential depreciation gap in the notes to the financial statements to enhance transparency for investors and other stakeholders (Accendoreliability, 2022; Tagsamurai, 2024).

To auditors: Develop audit procedures to assess the reasonableness of depreciation expense in currency-volatile environments, including whether the depreciation charge is adequate to meet asset replacement obligations. Where a material depreciation gap exists, consider whether it indicates a risk of material misstatement or warrants disclosure in the financial statements (Hello LandBank, 2025; WorkLifeWealth, 2025).

To investors and analysts: When analyzing companies in currency-volatile environments, adjust reported depreciation expense and accumulated depreciation, estimate the replacement cost of PPE, and assess the adequacy of depreciation reserves (EconomicLens, 2025; Fincyclopedia, 2025; Kaggle, 2026). Incorporate expected exchange rate movements into valuation models, particularly for companies with significant imported capital assets (Dumrauf, 2014; Mimir & Sunel, 2025).

6. Discussion

6.1 Theoretical Implications

This research contributes to accounting theory by highlighting a fundamental tension between the historical cost principle and the capital maintenance objective of depreciation (Wikipedia, 2002). The historical cost principle, embedded in IAS 16 and in IAS 21's translation requirements, prioritizes verifiability and consistency (AccountingInsights, 2025). However, when the measuring unit—the functional currency—is unstable over an asset's useful life, historical cost depreciation loses relevance. The capital maintenance objective of depreciation, by contrast, requires that depreciation be measured in a way that preserves the entity's productive capacity (Agiled.app, 2021; Numerade, 2021). These two objectives conflict in currency-volatile environments, and the current IAS framework prioritizes verifiability over relevance (Management Accounting.us, 2024; UseZaccheus, 2025; Zaccheus, 2025).

This research also contributes to the accounting choice literature by identifying the conditions under which the IAS 16 revaluation model is most beneficial (CPCON Group, 2026; TaxGuru, 2020). The cost model may remain appropriate in stable currency environments, where its lower cost outweighs its limitations (CliffsNotes, 2025; Sulzer, 2025). In currency-volatile

environments, however, the benefits of the revaluation model—more relevant depreciation expense and better capital maintenance—are likely to outweigh the additional cost of regular revaluations (Geberit, 2025; Treasurers, 2024b). This insight can inform both managerial accounting policy choices and regulatory guidance (BCRA, 2025; Sample Precious & Other Metals Exploration Corporation, 2011).

6.2 Practical Implications

For practitioners, this research offers a diagnostic framework for assessing the adequacy of depreciation reserves, together with practical adjustments that can be implemented within the current IAS framework. The two-track adjustment mechanism combining accounting revaluation with CAPM-informed investment decisions offers a comprehensive approach to addressing the depreciation gap.

As the illustrative calculations in Section 5 demonstrate, the depreciation gap is not merely a theoretical construct but carries real and economically significant implications. For a company with PKR 100 million of imported PPE, a 50 percent currency depreciation over the asset's useful life produces a replacement shortfall of PKR 50 million. This shortfall must be financed through retained earnings, new equity, or debt—each of which imposes costs on the firm and its shareholders. By adopting the revaluation model, companies can reduce this shortfall and better align accounting depreciation with economic reality.

6.3 Policy Implications

This research carries significant policy implications for accounting standard-setters, particularly in emerging economies. The current IAS framework, developed primarily for stable currency economies, does not adequately address the challenges facing entities that operate in currency-volatile environments. While IAS 29 addresses some of these challenges, its hyperinflation threshold is too high to capture many economies experiencing significant currency depreciation.

A potential solution is to introduce a “currency depreciation adjustment” requirement, triggered when cumulative exchange rate depreciation exceeds a specified threshold (e.g., 50 percent over five years), regardless of whether the IAS 29 hyperinflation threshold is met. This would be consistent with the restatement principle of IAS 29, but would use exchange rate movements

rather than domestic inflation as its trigger relevance of financial reporting in currency-volatile environments without imposing undue costs on preparers.

National regulators in emerging economies can also play a role by issuing local guidance tailored to the specific challenges of their economic environments. For example, the State Bank of Pakistan or the Securities and Exchange Commission of Pakistan could require listed companies to adopt the revaluation model for material imported PPE and to disclose the replacement cost of their assets. Such guidance would improve transparency and support more informed decision-making by investors and analysts.

6.4 Limitations and Future Research

Several limitations of this research should be acknowledged. First, the analysis relies on secondary data and illustrative calculations rather than a comprehensive empirical study of corporate financial statements. Future research could conduct a large-scale empirical study of depreciation practices in emerging economies, using publicly available financial statements to quantify the depreciation gap and its consequences. Second, the research is limited to three countries—Pakistan, Nigeria, and Egypt—and may not generalize to all emerging economies. Future research could extend the analysis to a broader sample of countries with different exchange rate regimes and inflation conditions. Third, the proposed adjustment framework has not been tested in practice. Future research could use case studies or field experiments to evaluate the feasibility and effects of implementing the two-track adjustment mechanism in real corporate settings. Fourth, the research does not address the tax implications of the proposed adjustments. In most jurisdictions, tax depreciation is based on historical cost and does not adjust for inflation or exchange rate changes. Future research could explore the interaction between financial reporting and tax depreciation in currency-volatile environments, and its implications for corporate tax planning. Fifth, the research does not fully address the implications of the proposed adjustments for financial statement analysis and valuation. Future research could develop valuation models that explicitly incorporate the depreciation gap and examine its impact on equity valuation and credit risk assessment.

7. Conclusion

The fundamental purpose of depreciation expense to allocate the cost of an asset systematically over its useful life so as to accumulate funds for its replacement—is a cornerstone of sound financial management and capital maintenance. In stable currency environments, historical cost

depreciation adequately serves this purpose. In currency-volatile environments, however, the gap between historical cost and replacement cost widens over time, compromising the entity's ability to maintain its productive capacity.

The IAS framework provides tools to address this disconnect, particularly the revaluation model in IAS 16 and the restatement principles in IAS 29. These tools, however, remain underutilized or inapplicable in most currency-volatile economies. This paper has argued that a more proactive approach is needed—one that recognizes the distinctive challenges facing entities operating in depreciating currency environments and provides practical guidance for adjusting accounting depreciation to reflect economic reality.

The stakes are high, inadequate depreciation reserves force entities to underinvest in replacement assets, seek external financing, or draw on retained earnings each with negative implications for long-term growth, financial stability, and shareholder value. By addressing the depreciation gap, entities can strengthen their financial resilience, enhance the relevance of their financial reporting, and better navigate the challenges of operating in currency-volatile economies.

This research underscores the need for a more nuanced approach to depreciation accounting one that balances the benefits of verifiability and consistency against the requirements of relevance and capital maintenance. As the global economy grows more interconnected and exchange rate volatility persists, this balance will become increasingly critical for entities, investors, and policymakers alike.

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