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Preventive Treasury Controls and FX Risk Mitigation in Emerging Market Multinationals: A Conceptual Model

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Abstract
Emerging market multinationals (EMMs) face a distinctive foreign exchange (FX) risk profile shaped by volatile local currencies, underdeveloped hedging markets, capital-account frictions, and the joint translation exposure arising from operating across multiple volatile currencies. Standard hedging theory, developed largely in the context of developed-market multinationals, does not straightforwardly accommodate these conditions. This article develops a conceptual model of preventive treasury control for FX risk mitigation in EMM contexts. Drawing on value-based hedging theory (Smith & Stulz, 1985; Froot, Scharfstein, & Stein, 1993), the empirical literature on corporate hedging practice (Bartram *et al*., 2011; Allayannis & Weston, 2001), and the treasury-control literature (COSO, 2013; IIA, 2020), the model positions FX control as a preventive rather than detective activity. Five preventive control elements are specified: exposure identification, policy and governance, instrument and counterparty selection, execution discipline, and settlement control. Each element is mapped to the distinctive constraints facing EMMs, including limited forward market depth beyond short tenors, non-deliverable forward reliance, counterparty concentration, and the interaction between FX exposure and local accounting disclosure requirements. The model generates propositions about the relationship between preventive control maturity and firm-level outcomes including earnings volatility, cost of external finance, and audit scope. The article concludes by identifying three priority empirical directions: comparative studies of FX control maturity across EMMs in Sub-Saharan Africa, Southeast Asia, and Latin America; the interaction between central-bank capital-flow policies and corporate hedging cost; and the effect of internal FX policy codification on hedging-decision latency.

Keywords: FX risk managementm, Preventive treasury controls, Emerging market multinationals, Hedging, COSO framework, Treasury governance, Corporate risk management

1. Introduction
Emerging market multinationals (EMMs) confront a foreign exchange (FX) risk environment that differs materially from that of developed-market multinationals. Local currencies exhibit higher short-term volatility, deeper skewness in distributions of returns, and pronounced tail risk during episodes of capital-flow reversal or macroeconomic stress. Hedging-market infrastructure is thinner: forward markets frequently stop at short tenors, non-deliverable forwards substitute for deliverable contracts in currencies with convertibility restrictions, and the supply of derivative counterparties is concentrated in a small number of international banks with limited local presence (Bartram *et al*., 2011; Bekaert & Harvey, 2003; Stein *et al*., 2001). The consequence is that EMM treasury functions cannot simply replicate the practices of developed-market peers. They require a treasury control architecture adapted to the structural conditions under which they operate.

The treasury function in EMMs therefore operates under a different constraint set than its developed-market counterparts. The standard hedging theory of Smith and Stulz (1985) and Froot, Scharfstein, and Stein (1993) identifies value-increasing motivations for hedging under conditions that hold broadly for EMMs, including costly external finance, convex tax schedules, and investment-dependent cash flow. But the operationalisation of hedging, through instrument selection, counterparty management, and execution discipline, requires a control architecture that reflects the environmental constraints rather than replicating developed-market practice uncritically.

This article develops a conceptual model of preventive treasury control for FX risk mitigation in EMM contexts. The model positions FX control as a preventive rather than detective activity, emphasising controls that operate at the point of exposure creation or hedging decision rather than after loss realisation. The preventive orientation is consistent with the general distinction in the internal control literature between preventive controls, which constrain the occurrence of loss events, and detective controls, which identify losses after the fact (COSO, 2013). Applied to FX, the distinction is material: EMMs cannot rely on post-loss detection to manage exposures whose realisation may be rapid and non-linear. Preventive controls, operating before exposure or at the point of hedging decision, are the architecturally appropriate response.

The model specifies five preventive control elements: exposure identification, policy and governance, instrument and counterparty selection, execution discipline, and settlement control. Each element is developed in Section 4, and each is mapped to the distinctive constraints facing EMMs. The model generates six propositions about the relationship between preventive control maturity and firm-level outcomes, and identifies three priority empirical directions for subsequent research.

The contribution is conceptual. The existing treasury-control literature is thinner than its importance warrants, and the FX-specific element has been underdeveloped relative to broader treasury topics. By providing an explicit conceptual architecture, the article offers a structured vocabulary for subsequent empirical work and a diagnostic tool for treasury practitioners undertaking control-environment assessments. The model draws on, and contributes to, the broader corporate risk management literature, which has moved in recent years toward integrating treasury, enterprise risk management, and financial reporting dimensions of risk control (Aabo *et al*., 2010; Hopkin, 2018).

The conceptual architecture is summarised in Figure 1. Five preventive control elements operate on upstream exposures before they crystallise into realised losses, with feedback loops to the governance and policy layer that shapes the operational control environment.

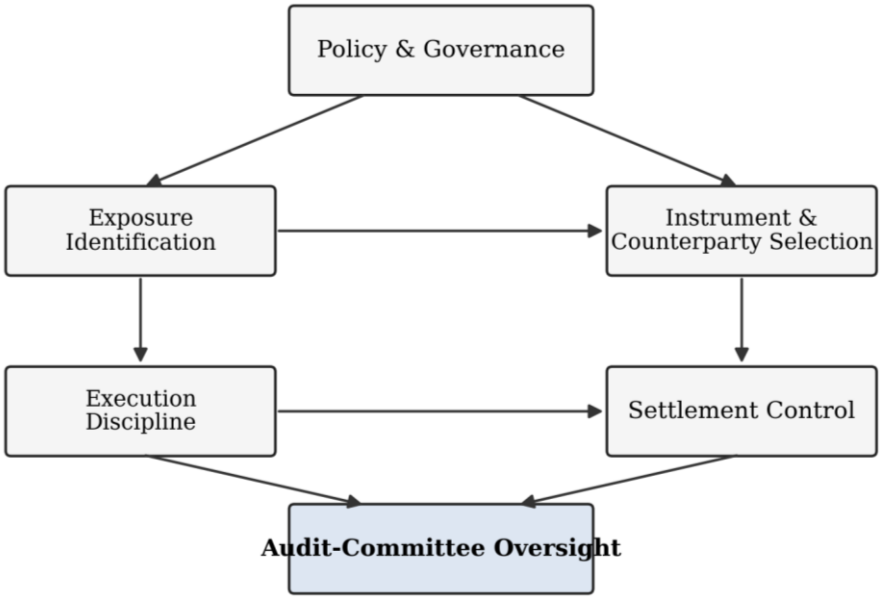

Fig 1: Conceptual architecture of preventive FX treasury control in emerging market multinationals. The five preventive elements operate upstream of loss realisation; governance feedback loops maintain the control environment.

2. Theoretical Foundations

The hedging theory literature provides the starting point. Smith and Stulz (1985) identified three value-increasing motivations for hedging: reduction of expected tax liability under convex tax schedules, reduction of expected bankruptcy costs, and reduction of underinvestment costs arising from the joint distribution of investment opportunities and internally generated cash flow. Froot, Scharfstein, and Stein (1993) developed the underinvestment-cost argument into a general theory of hedging as a mechanism for aligning internal cash flow with the firm's optimal investment schedule. Subsequent empirical work has tested these predictions with mixed support, and the view that has emerged from the literature is that hedging contributes modestly to firm value when financial distress costs or underinvestment risks are material (Allayannis & Weston, 2001; Bartram *et al*., 2011).

The internal control literature provides the control taxonomy. The COSO Internal Control Integrated Framework distinguishes preventive from detective controls, and identifies control environment, risk assessment, control activities, information and communication, and monitoring as the five components of internal control (COSO, 2013). Applied to treasury, the distinction between preventive and detective controls is material: preventive controls operate at the point of exposure creation or hedging decision and constrain outcomes before loss; detective controls identify exceptions after the fact. In EMM contexts, where losses can be rapid and non-linear, the preventive orientation is particularly valuable.

The IIA Three Lines Model clarifies responsibility for control design and operation (IIA, 2020). Applied to treasury, the first line comprises treasury execution staff and line treasury management; the second line comprises risk and compliance functions with oversight over treasury policy adherence; the third line comprises internal audit with independent assurance over the treasury control environment. The model is normative, and in practice the lines are frequently blurred

in EMM treasury organisations, where treasury often performs its own risk analytics and compliance work in the absence of dedicated second-line capacity.

The corporate risk-management literature has increasingly framed risk management as an enterprise-level capability rather than a treasury-specific specialism. Hopkin (2018) and the COSO Enterprise Risk Management framework (COSO, 2017) locate FX risk management within a broader risk taxonomy that includes strategic, operational, reporting, and compliance dimensions. The integration framing is consistent with the view developed here that preventive FX controls are most effective when embedded in the wider enterprise risk management architecture, rather than operated as a technical treasury silo.

The emerging-markets finance literature provides the environmental context. Studies of exchange-rate regime effects, capital-flow dynamics, and the pricing of sovereign and corporate risk in emerging markets identify the structural conditions that shape the EMM treasury environment (Bekaert & Harvey, 2003; Frankel, 1999; Kaminsky & Reinhart, 1999). The conditions include higher baseline volatility, deeper tail-risk distributions, episodic liquidity withdrawal, and limited hedging-market depth. These conditions are the binding constraints on the operational design of FX controls and distinguish EMM practice from developed-market practice.

A specific strand of the emerging-markets literature has examined the role of natural hedging and operational hedging. Natural hedging matches currency composition of revenues and costs, reducing net exposure without derivative contracts; operational hedging configures the firm's real operating footprint to adjust exposure dynamically. Both approaches have particular relevance to EMMs where the cost or availability of derivative hedging is constrained (Allayannis *et al*., 2001; Chowdhry & Howe, 1999; Pantzalis *et al*., 2001). The preventive control framework developed in this article treats natural and operational hedging as first-order elements of the exposure-identification and policy layers, not as residual substitutes for financial hedging.

The trajectory of the corporate-hedging empirical literature also informs the framework. Early empirical work focused narrowly on the determinants of derivative use, treating hedging as a binary choice and the intensity of hedging as a continuous dependent variable correlated with firm characteristics such as size, leverage, and investment opportunities (Mian, 1996; Nance *et al*., 1993; Tufano, 1996). Subsequent work added richer measures of exposure, including the explicit modelling of both financial and operational hedges, and extended the geographic scope of the evidence to cover non-US contexts (Bartram *et al*., 2009; Bodnar & Gebhardt, 1999; Pramborg, 2005). A further generation of work has examined the effects of hedging on firm value, cost of capital, and investment efficiency, and has progressively refined the estimation strategies needed to establish causal identification in the presence of selection into hedging (Allayannis & Weston, 2001; Campello *et al*., 2011; Jin & Jorion, 2006). The cumulative evidence supports a modest but robust value-creation effect of hedging when the value-based motivations are present, and the framework advanced here is consistent with this evidence base.

The role of corporate governance in the oversight of hedging activity has received increasing attention over the past decade. Lel (2012) documents cross-country evidence that governance quality is associated with the prevalence of hedging programmes designed to reduce risk rather than to speculate, and that the substitution between these two orientations is particularly salient in emerging-market contexts where governance standards vary widely. The governance dimension is treated in the framework developed here as a first-order element of the policy-and-governance layer, and the empirical evidence on the governance-hedging interaction provides external support for the framework's emphasis on this layer.

A fourth theoretical input comes from the literature on operational hedging through geographic diversification. Work by Allayannis, Ihrig, and Weston (2001), Pantzalis, Simkins, and Laux (2001), and subsequent contributors has examined how the configuration of the firm's operating footprint across currencies affects its residual FX exposure and its reliance on financial hedging. For EMMs with operations across multiple emerging-market currencies, operational hedging is often the dominant mechanism of exposure reduction, and financial hedging operates on the residual exposure that operational configurations cannot absorb. The framework developed here treats the interaction between operational and financial hedging as an explicit dimension of the exposure-identification layer and of the subsequent instrument-selection decisions.

Table 1 summarises the theoretical foundations of the framework and their specific contributions to the model developed in this article.

Table 1: Theoretical foundations of the preventive treasury control model and their implications for FX risk management in EMMs.

Tradition	Central claim	Implication for preventive FX control
Value-based hedging theory	Hedging adds value by reducing distress, tax, or underinvestment costs.	Establishes why preventive control matters; shapes objective function.
Empirical hedging practice	Hedging intensity varies with firm characteristics and exposure type.	Informs exposure-identification and instrument-selection decisions.
Internal control (COSO)	Preventive and detective controls operate on different timing.	Preventive orientation is architecturally appropriate for fast-moving FX risk.
Three Lines Model (IIA)	Responsibility for control should be allocated across three lines.	Defines governance structure for FX control oversight.
Emerging-markets finance	Structural conditions in EMM environments differ qualitatively.	Binds the operational design of controls to the EMM context.

3. Methodology

The paper adopts a conceptual methodology. Conceptual research in finance and accounting is recognised as a legitimate contribution when the phenomenon under investigation is difficult to observe directly, when existing empirical literatures are fragmented across traditions that require synthesis, or when a structured vocabulary is required to organise subsequent empirical work (Meredith, 1993;

Whetten, 1989). Each of these conditions applies to FX control in EMMs: direct observation is constrained by the confidentiality of treasury operations; empirical evidence is scattered across the hedging, internal control, and emerging-markets finance literatures; and the absence of a shared analytical vocabulary has inhibited comparative work.

The conceptual synthesis followed a structured protocol. Primary sources were identified through targeted searches of Scopus, Web of Science, SSRN, and the archives of the Bank for International Settlements and the International Monetary Fund. Key-word combinations covered hedging theory, corporate risk management, internal control over financial reporting, and emerging-markets finance. Supplementary sources were identified through citation tracing from the primary sources, with priority given to articles published in top-tier finance and accounting journals, high-impact internal control literature, and practitioner studies from international treasury associations.

The synthesis proceeded through three stages. First, each of the five preventive control elements was developed by integrating the relevant finance theory, internal control guidance, and empirical evidence. Second, the EMM-specific constraints on each element were identified through targeted review of the emerging-markets finance literature. Third, the propositions were derived by combining the preventive control framework with the empirical evidence on hedging outcomes, generating testable relationships amenable to subsequent case-study or archival research designs.

The article does not claim to have conducted a systematic literature review in the PRISMA sense, and the conceptual nature of the contribution is explicit rather than implicit. Subsequent empirical work is required to test the propositions advanced and to calibrate the model against observed EMM treasury practice. The article's contribution is the structured vocabulary and the explicit mapping between preventive control elements and outcomes, which the subsequent empirical work can use as a basis for hypothesis generation and for the design of measurement instruments.

4. The Five Preventive Control Elements

The first element is exposure identification. FX exposure in an EMM arises from multiple sources: transaction exposures (foreign-currency receivables and payables, foreign-currency loans), translation exposures (consolidation of foreign subsidiary financial statements), economic exposures (cash-flow sensitivity to exchange-rate movements in non-denominated currencies), and contingent exposures (guarantees, purchase options, embedded derivatives). Preventive control at this element requires the identification of exposures before they become binding, using exposure-mapping tools integrated with the treasury management system and with forecasted operational flows. Exposure identification is the foundation of the control architecture; without it, the subsequent elements operate on an incomplete exposure set.

The second element is policy and governance. A treasury policy specifies the objective of the hedging programme, the instruments permitted, the counterparty limits, the execution authorities, and the reporting obligations. A well-designed policy translates the firm's risk appetite into operational constraints on treasury activity, constraining the discretion of treasury staff and providing an audit trail for hedging decisions. Governance arrangements, typically involving an asset-liability committee or a treasury risk committee reporting to the audit committee of the board, provide oversight and accountability. Preventive control at this element is achieved through the codification of the policy and through the operation of the governance arrangements.

The third element is instrument and counterparty selection. Instrument selection covers the choice among forwards, options, cross-currency swaps, non-deliverable forwards, and natural-hedge alternatives. The choice is constrained by the availability of instruments in the relevant currency, by the cost of the instruments (including implicit costs arising from bid-offer spread and credit charge), and by the accounting treatment implications under the relevant GAAP or IFRS regime. Counterparty selection covers the choice of hedging counterparties, with consideration of counterparty credit quality, local market presence, and operational capacity for bespoke structures. In EMM contexts, the available instrument set is frequently narrower than in developed markets, and counterparty concentration in a small number of international banks is common (Chowdhry & Howe, 1999).

The fourth element is execution discipline. Execution discipline covers the processes through which individual hedging transactions are initiated, priced, confirmed, and documented. Preventive control at this element requires a defined execution workflow, with segregation of duties between initiation and confirmation, price-challenge protocols that mitigate the risk of off-market execution, and documentation standards that support accounting hedge-designation requirements. The adoption of electronic trading platforms, treasury management system integration with trading platforms, and straight-through processing of confirmations materially raises execution discipline in developed-market practice and is increasingly available to EMM treasuries.

The fifth element is settlement control. This element captures the processes by which hedging transactions are settled and reconciled. Preventive control at this element requires segregation of duties between execution and settlement, automated matching against counterparty confirmations, and exception-management procedures for settlement breaks. Settlement failures are a low-frequency but high-severity risk in EMM contexts, where local banking infrastructure may operate with longer settlement cycles or higher operational-risk profiles than developed-market equivalents (COSO, 2013; IIA, 2020).

The five elements operate as a sequence. Exposure identification produces the input to policy and governance; policy constraints govern instrument and counterparty selection; selection decisions are operationalised through execution; execution is completed through settlement. Weakness at any element propagates through the sequence, and the preventive orientation of the architecture depends on all five operating at sufficient maturity. Figure 2 illustrates the sequence and the feedback loops that maintain the control environment over time.

A further consideration at the exposure identification element concerns the treatment of economic exposure, which is often the largest and least-visible source of FX risk. Economic exposure captures the sensitivity of the firm's future cash flows to exchange-rate movements through the competitive, operational, and pricing channels. Unlike transaction exposure, which is visible in the accounting records, economic exposure is embedded in the firm's strategic positioning and requires scenario-analytic tools rather than ledger-based measurement (Adler & Dumas, 1984; Shapiro,

1975). In EMM contexts, where exchange-rate movements are frequently accompanied by broader macroeconomic adjustments, economic exposure is particularly material and particularly difficult to measure (Moffett & Karlsen, 1994; Muller & Verschoor, 2006).

At the policy and governance element, the use of derivative disclosure as an accountability mechanism has grown over the review period. Disclosure of derivative positions in financial statements, expanded under successive iterations of SFAS 133, IAS 39, and IFRS 9, has raised the reputational cost of policy breaches and has provided external analysts and investors with a window into treasury practice (DeMarzo & Duffie, 1995; Wong, 2000). EMM firms operating under local-GAAP regimes that have not fully converged with IFRS on derivative accounting face an additional policy-design challenge: the interaction between local disclosure rules and the transparency expectations of international capital providers.

At the instrument and counterparty selection element, a substantial empirical literature has documented the determinants of derivative usage across firm types. Nance, Smith, and Smithson (1993), Mian (1996), and Graham and Rogers (2002) identify size, leverage, tax shield utilisation, and investment-opportunity structure as predictors of hedging intensity. Subsequent international comparative work has extended these findings across developed and emerging markets (Bartram *et al*., 2009; Bodnar & Gebhardt, 1999; Goldberg *et al*., 1998; Judge, 2006; Loderer & Pichler, 2000). The evidence converges on the view that hedging decisions reflect a combination of firm characteristics and environmental constraints, and the EMM context shifts the balance toward environmental constraints relative to firm characteristics.

At the execution discipline element, the literature identifies several distinctive risks in EMM operating environments. Voice-channel execution under time pressure can produce off-market trades; reliance on a single counterparty for a material position can result in unfavourable pricing during stressed markets; informal authorisation practices can mask unauthorised trading. Each of these risks is mitigated by specific preventive controls, but the controls require investment in both technology and staff capability that frequently exceeds the budget available to EMM treasury functions (Bodnar *et al*., 1998; Marshall, 2000; Pramborg, 2005).

Price-challenge protocols at the execution layer deserve specific mention. A well-designed protocol requires that executed prices be benchmarked against contemporaneous indicative prices from independent sources, with material deviations flagged for post-execution review. Implementation requires access to independent pricing feeds, which may be more limited in EMM currencies than in major developed-market currencies, and requires analytical capacity to evaluate deviations in the light of prevailing market conditions. The investment is justified both by the direct reduction in off-market execution risk and by the deterrent effect on the execution staff, who act with greater discipline when they know their executions will be independently reviewed.

At the settlement control element, the operational-risk profile of local banking infrastructure in EMM jurisdictions requires specific attention. Settlement failures arising from bank operational errors, from delayed confirmation, or from manual intervention in the payment chain can produce losses that are not captured by the derivative-pricing risk analytics and are not covered by the counterparty-credit risk limits. The preventive control response is the integration of settlement records with operational risk-event logs and the escalation of material settlement breaks to the same governance mechanisms that address other operational-risk events (Haushalter, 2000; Tufano, 1996). Quantification of settlement-related tail risk has been supported by adaptations of value-at-risk methodology (Jorion, 2007), and cloud-hosted treasury platforms have introduced additional considerations for identity and access management that extend the settlement-control envelope beyond traditional on-premises boundaries (Mbonu *et al*., 2020; Nwankwo *et al*., 2020; Oshoba *et al*., 2020).

A specific operational-risk feature of settlement control in EMM contexts concerns the handling of local-currency settlement with offshore counterparties. Where hedging is executed with international banks but settled through local banking infrastructure, the settlement process traverses the boundary between different regulatory and operational regimes. Delays, reconciliation breaks, and occasional losses arise at this boundary with a frequency materially higher than in purely domestic or purely offshore settlement chains. Preventive control at the settlement layer must therefore include explicit attention to the cross-border settlement interface, with reconciliation arrangements that bridge the onshore and offshore records and with escalation protocols that address cross-border exceptions within a short time window (Bartram, 2008; Rossi, 2013).

The exposure-identification element in EMM contexts also deserves extended treatment in relation to translation exposure. EMMs with subsidiaries reporting in local currencies experience translation exposure on the consolidation of those subsidiaries into group financial statements expressed in a reporting currency. Translation-exposure management is conceptually distinct from transaction-exposure management because translation effects arise from period-end revaluation rather than from cash-flow events, and the standard hedging theory of Smith and Stulz (1985) and Froot, Scharfstein, and Stein (1993) does not apply to translation exposure without adaptation. Practice varies widely in the management of translation exposure, with some EMM groups hedging translation exposure explicitly through net-investment hedges and others accepting translation volatility as an unavoidable feature of operating across multiple currencies. The framework developed here treats translation exposure as a distinct dimension of exposure identification, requiring separate policy treatment from transaction exposure (Hagelin & Pramborg, 2004; Martin & Mauer, 2003).

The policy-and-governance element includes a set of specific design choices that warrant extended treatment. These include the designation of the accountable hedging authority (typically the Group Treasurer or the Chief Financial Officer), the delegation of authority to local or subsidiary treasury staff, the definition of permitted hedging instruments and prohibited speculative positions, the specification of counterparty credit limits and concentration thresholds, the establishment of reporting obligations to the board and audit committee, and the articulation of the hedging objective in terms consistent with the firm's risk appetite. Each of these choices has implications for the operation of the subsequent elements of the framework, and inadequate specification at the policy layer produces recurring operational tensions

downstream. Practitioner experience consistently identifies policy specification as the area where treasury transformation programmes deliver the highest marginal returns on effort invested (Dolde, 1993; Rawls & Smithson, 1990).

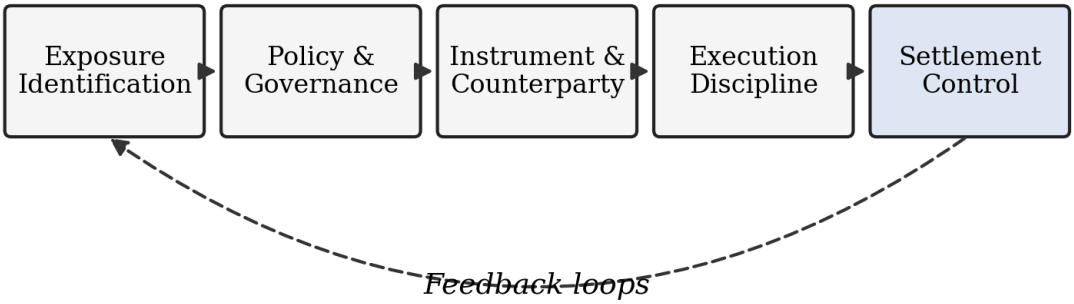

Fig 2: Sequence of preventive control elements and feedback loops. Weakness at any element propagates downstream; feedback loops maintain policy calibration.

Table 2: Five preventive control elements, their operational components, and EMM-specific constraints.

Element	Operational components	EMM-specific constraint
Exposure identification	Transaction, translation, economic, contingent	Data gaps in operational subsystems; legacy subledgers
Policy and governance	Treasury policy, ALCO, audit committee oversight	Limited independent-director treasury expertise
Instrument and counterparty	Forwards, options, NDFs, natural hedges	Thin tenor depth; counterparty concentration
Execution discipline	Workflow, price-challenge, STP	Limited electronic-platform access in local markets
Settlement control	Matching, confirmation, exception management	Longer local settlement cycles; operational risk

5. Interactions Among Elements and with Outcomes

The five elements do not operate independently. Exposure identification quality bounds the effectiveness of policy and governance, because policies that reference exposures not visible to the treasury function cannot be operationalised. Policy specification bounds instrument and counterparty selection, because selection decisions must be consistent with policy constraints. Execution discipline and settlement control jointly determine the operational reliability of the hedging programme and feed back into the assessment of policy adherence. Weakness at any element propagates through the architecture and reduces the effectiveness of the elements that depend on it.

The interactions among elements are the source of the framework's principal analytical claim: that preventive control effectiveness is a function of the weakest element, rather than the average of the five. Organisations with high maturity on four elements but persistent weakness on one achieve preventive control only to the level of the weakest element. The policy implication is that treasury control investments should be directed to the weakest element rather than to the reinforcement of already-mature elements, and the measurement implication is that preventive control maturity should be assessed against the minimum rather than the average of the elemental scores (Aabo *et al*., 2010; Servaes *et al*., 2009).

The framework generates six falsifiable propositions about the relationship between preventive control maturity and firm-level outcomes. Proposition 1: a one-standard-deviation increase in exposure-identification maturity (measured by completeness of exposure-inventory coverage across subsidiaries and tenors) is associated with at least a 15 per cent reduction in the coefficient of variation of quarterly translation-adjusted earnings, over a three-year window. Proposition 2: organisations with documented, board-approved hedging policies exhibit hedge-ratio variance across quarters at least 30 per cent lower than organisations without such policies, controlling for exposure volatility. Proposition 3: formal counterparty-selection and instrument-tier protocols reduce realised hedging cost (measured as the spread between executed rates and contemporaneous interbank benchmarks) by at least 20 basis points relative to discretionary selection, for equivalent hedge size. Proposition 4: execution-discipline maturity (dual-control and pre-trade limit systems) reduces the frequency of policy-breach transactions to below 0.5 per cent of total hedging volume. Proposition 5: settlement-control maturity reduces settlement-failure rates to below 0.1 per cent and reduces associated loss magnitude by at least 50 per cent relative to manually reconciled environments. Proposition 6: firms scoring above the 75th percentile on composite preventive-control maturity receive auditor assessments of treasury-control environment at Low-Risk rating in at least 70 per cent of observations, compared to below 30 per cent for firms below the 25th percentile, with corresponding audit-hour reductions of at least 15 per cent. Each proposition specifies the construct, the measurement approach, and the disconfirming condition.

The propositions are amenable to empirical testing through a combination of archival data (firm-level earnings volatility, audit outcomes), survey data (treasury-practice surveys that measure preventive control maturity), and case-study designs that link control configuration to observed outcomes over multi-year horizons. Each proposition specifies a directional prediction and identifies the construct to be measured on each side of the relationship, and each is distinct from the others in its causal claim.

The specific applicability of the propositions to EMMs follows from the environmental analysis in Section 2. The tail-risk profile of EMM currencies means that the marginal effect of preventive control maturity on earnings volatility is likely to be larger in EMM contexts than in developed-market contexts (Proposition 1). The thin hedging-market infrastructure means that instrument and counterparty selection decisions are more consequential in EMM contexts, raising the predictive importance of Proposition 3. The observed weaknesses in settlement infrastructure in EMM contexts raise the predictive importance of Proposition 5. The propositions therefore generate a set of context-specific predictions that differ in strength across the EMM and

developed-market comparator populations.

The propositions also have implications for the comparative analysis of hedging outcomes across subsidiary locations within a single multinational group. Within-group variation in preventive control maturity, reflecting differences in local treasury infrastructure or local regulatory constraints, predicts within-group variation in the outcome measures associated with each proposition. Testing within-group variation controls for firm-level characteristics that otherwise confound cross-firm comparisons, and is a research strategy suited to the detailed data that can be obtained through case-study engagement with specific EMM firms. The within-group approach is a complement to, rather than a substitute for, cross-firm archival testing, and both approaches are warranted on the propositions advanced here (Guay & Kothari, 2003; Stulz, 1996).

A final dimension of the interaction framework concerns the dynamic character of preventive control maturity. The five elements do not reach a steady state; they require continuing investment to sustain effectiveness as the business environment, the regulatory environment, and the hedging-market environment evolve. Maturity achieved at one point in time can be eroded by under-investment, by loss of key staff, by turnover of external counterparties, or by changes to the regulatory framework that invalidate prior policy calibration. The framework therefore requires a dynamic rather than static application, with regular re-assessment of maturity across the five elements and with adjustment of the investment plan in response to changes in the underlying environment.

The dynamic application of the framework has specific implications for the measurement of preventive control maturity over time. Maturity assessments should be conducted at regular intervals, typically annually, using a consistent methodology that supports comparison across years. Material changes in external conditions (for example, the introduction of new hedging instruments in local markets, changes in capital-account regulation, or shifts in counterparty availability) should trigger interim re-assessments on the dimensions most affected. The maturity measurement programme should be integrated with the broader enterprise risk management measurement calendar to avoid duplication of effort, and its outputs should feed into the board-level risk picture that informs strategic resource-allocation decisions. This approach transforms maturity measurement from a static audit exercise into a continuing governance activity embedded in the operating rhythm of the treasury function (Hopkin, 2018; Servaes *et al*., 2009).

Table 3: Six propositions linking preventive control element maturity to firm-level outcomes.

#	Preventive Control Element	Outcome	Predicted Sign
P1	Exposure identification maturity	Earnings volatility	Negative
P2	Policy and governance maturity	Hedging consistency over time	Positive
P3	Instrument/counterparty selection	Cost-effectiveness of hedging	Positive
P4	Execution discipline	Off-market or policy-breach frequency	Negative
P5	Settlement control strength	Settlement failure frequency	Negative
P6	Preventive control maturity overall	Audit scope and cost	Negative

6. EMM-Specific Design Considerations

The five preventive elements require EMM-specific adaptation in their operational design. For exposure identification, EMMs frequently operate with legacy operational subsystems that do not feed the treasury management system in real time, producing a systematic lag between exposure emergence and exposure visibility. Adaptation requires investment in data integration from operational systems into the TMS, with protocols for the early visibility of material exposures ahead of system reconciliation. The practical implication is that exposure identification in EMM contexts is frequently an information-systems problem as much as a measurement problem, and its resolution requires coordination between treasury and IT.

For policy and governance, EMM boards frequently lack the independent-director treasury expertise to provide effective oversight of hedging policy. Adaptation requires investment in director education, in the operation of treasury risk committees below the board, and in the quality and frequency of treasury reporting to the board. Practitioner literature emphasises the value of bringing external treasury expertise onto the risk committee, either through non-executive appointments or through advisory retainers, to compensate for gaps in internal director capability (Aabo *et al*., 2010; Hopkin, 2018).

For instrument and counterparty selection, the narrower available instrument set and the counterparty concentration in EMM markets require explicit attention to concentration limits, to the use of non-deliverable forwards as substitutes for deliverable contracts in restricted currencies, and to the role of natural and operational hedges as complements to financial hedges. The accounting consequences of non-deliverable forwards under IFRS 9 and analogous standards introduce additional complexity that treasury policy must address (Bodnar *et al*., 1998; Géczy *et al*., 1997).

For execution discipline, the limited electronic-platform access in some EMM markets means that a higher proportion of execution occurs through voice channels, raising the importance of post-execution review and of price-challenge protocols. The adaptation requires investment in post-trade analytics, including benchmarking of executed prices against contemporaneous market data, and in the documentation of execution rationale where voice-channel execution is used.

For settlement control, the longer local settlement cycles and the higher operational-risk profile of local banking infrastructure mean that settlement failures have larger implications than in developed markets. Adaptation requires investment in exception-management protocols, in the integration of TMS settlement records with bank account statements, and in the clear assignment of responsibility for settlement-break investigation. Governance arrangements should ensure that settlement failures above defined thresholds escalate to the treasury risk committee and to internal audit.

The domestic regulatory environment also shapes the EMM design space. Many EMM jurisdictions impose capital-flow management measures, reporting requirements for derivative transactions, or restrictions on the purposes for which hedging can be undertaken. Treasury policy must reflect the specific regulatory constraints operating in each jurisdiction

where the firm operates, and the regulatory-monitoring function must be resourced sufficiently to track policy changes that may occur on short notice (International Monetary Fund, 2016; Kaminsky & Reinhart, 1999).

The interaction between FX hedging and debt-financing decisions is a further EMM-specific consideration. Firms in emerging markets frequently issue foreign-currency debt to access deeper capital markets, which introduces a secondary FX exposure on principal and interest obligations. The hedging programme must therefore cover both operational and financial exposures, and the allocation of hedging instruments across the two sources of exposure is a policy decision with material implications for reported earnings volatility (Elliott *et al*., 2003; Shapiro, 2013). Empirical evidence suggests that firms making effective use of foreign-currency debt tend to exhibit lower overall cost of capital when the debt exposure is appropriately hedged (Purnanandam, 2008; Strebulaev, 2007).

A further consideration concerns the interaction between hedging and firm-level governance. Cross-country evidence identifies that the quality of corporate governance is associated with the sophistication of hedging practices and with the effective use of derivatives for risk reduction rather than speculation (Campello *et al*., 2011; Lel, 2012). For EMM boards, this evidence supports investment in the independent-director expertise and committee-level treasury oversight identified earlier, and provides empirical grounding for the governance-layer recommendations of the framework.

The competitive-pressure channel through which FX movements affect firm value is particularly strong for EMMs operating in tradable-goods sectors. Empirical work on the automotive, manufacturing, and consumer-goods sectors identifies material effects of exchange-rate movements on competitive positioning and on pricing margins (He & Ng, 1998; Williamson, 2001). For EMMs in these sectors, natural and operational hedging through geographic diversification of the operating footprint is a first-order policy consideration, and the financial-hedging programme must be designed to complement rather than duplicate the natural-hedge component (Hagelin & Pramborg, 2004; Jin & Jorion, 2006; Martin & Mauer, 2003).

Post-crisis empirical work has examined how EMM treasury practices responded to the Global Financial Crisis and subsequent emerging-market stress episodes. The evidence shows that preventive control discipline was associated with lower realised losses during periods of heightened FX volatility, while firms relying on detective controls or on speculative hedging positions experienced materially larger losses (Brown, 2001; Rossi, 2013; Zhou & Wang, 2013). The post-crisis evidence provides empirical support for the preventive orientation advanced in this article and suggests that the cost of preventive control investment is justified by the realised-loss-reduction benefit, particularly in environments characterised by recurring stress episodes.

Regional variation in EMM treasury practice reflects the interaction between local hedging-market infrastructure and multinational treasury design. Brazilian EMMs, operating in a jurisdiction with relatively deep derivative markets and with active offshore hedging counterparties, have developed hedging practices that approximate those of developed-market firms on the instrument-availability dimension while retaining distinctive features on the counterparty-concentration and settlement-risk dimensions.

South African EMMs, operating in a jurisdiction with the most developed financial infrastructure on the African continent, have similarly developed sophisticated hedging practices but face distinctive exposures arising from commodity-currency interactions and from the joint volatility of the rand with other emerging-market currencies (Bartram *et al*., 2009; Goldberg *et al*., 1998). Indian EMMs, operating under substantial capital-account restrictions on non-deliverable forward use, have developed hedging practices that emphasise natural and operational hedges supplemented by onshore derivatives, producing a distinctive risk profile compared with EMMs operating in less-restricted jurisdictions.

Chinese EMMs represent a further distinctive case. The progressive liberalisation of the Chinese capital account over the review period has produced a dynamic regulatory environment in which the available hedging instruments and the permissible hedging purposes have changed materially from year to year. Chinese EMM treasury practice therefore requires an additional governance dimension not emphasised in the framework as developed for more stable regulatory environments: the continuous monitoring of regulatory change and the rapid adaptation of policy to accommodate new instruments or new restrictions. This dimension illustrates a broader point applicable across EMM contexts: the regulatory environment is itself a source of risk requiring management attention, and the preventive control framework should treat regulatory change as a dimension of exposure rather than as a static background condition (IMF, 2016; Kaminsky & Reinhart, 1999).

Sub-Saharan African EMMs face the most constrained hedging environment among the regional EMM populations. Currency markets are thin, tenor depth rarely extends beyond six months, non-deliverable forwards dominate in restricted currencies, and counterparty availability is concentrated in a small number of international banks with country-level presence. For EMMs operating in this environment, the exposure-identification and policy-and-governance layers of the framework bear disproportionate weight, because the instrument-selection options available through the subsequent layers are inherently limited. Natural and operational hedges through geographic diversification become particularly valuable, and the hedging programme must be designed around the structural constraints rather than around the analytical optimum suggested by theory. The framework developed here accommodates this adaptation, and its application to Sub-Saharan African EMMs is a priority for subsequent empirical work (Omollo, 2018).

Southeast Asian EMMs, operating in jurisdictions that experienced the Asian financial crisis of 1997 and its aftermath, have developed hedging practices influenced by the distinctive institutional memory of that episode. The crisis produced widespread recognition of the risks associated with unhedged foreign-currency liabilities and of the fragility of hedging arrangements under stress conditions. Post-crisis development of regional treasury practice has consequently emphasised conservative policy settings, limited reliance on speculative positions, and explicit treatment of tail-risk scenarios in hedging-decision analytics. These features align closely with the preventive orientation advanced in this article, and the Southeast Asian experience can be read as empirical support for the framework's architectural choices (Bekaert & Harvey, 2003; Kaminsky & Reinhart, 1999).

7. Governance Architecture and Implementation

The governance architecture for preventive FX control operates on three levels. At the board level, the audit committee or a dedicated risk committee receives treasury reporting, approves the treasury policy, and commissions periodic independent reviews. At the management level, an asset-liability committee or treasury risk committee monitors policy adherence, approves material exceptions, and oversees the operation of the five preventive elements. At the operational level, treasury management maintains day-to-day operation of the elements and reports upward through the governance chain.

Governance of treasury risk management requires active audit-committee oversight. The audit committee should receive periodic treasury reports covering exposure levels against policy limits, hedging portfolio composition, counterparty concentration, and policy exceptions. In EMM contexts, where policy limits may need to be revised more frequently in response to local market conditions, a standing item in the audit committee agenda provides the institutional channel for policy maintenance (COSO, 2017; IIA, 2020; Sanni *et al*., 2020).

Implementation of the preventive control framework requires sequenced investment over multiple reporting cycles. The literature on the implementation of enterprise risk management frameworks (COSO, 2017; Hopkin, 2018) identifies three recurring success factors: clarity of the executive sponsor and accountable officer, phased deployment that delivers incremental capability rather than big-bang transformation, and sustained investment in staff capability alongside technology. Applied to the preventive FX control framework, the success factors translate into recommendations for designating a chief financial officer or group treasurer as the accountable officer, for sequencing implementation across the five elements over two to three reporting cycles, and for parallel investment in treasury staff training and in treasury technology.

Measurement of preventive control maturity is a separate implementation consideration. The framework provides a structured basis for maturity assessment through the five elemental dimensions. A four-level scale (ad-hoc, defined, managed, optimised) applied to each element produces a preventive-control maturity profile that supports both self-assessment and independent assurance. The minimum across elements, rather than the average, should be used as the composite maturity score, consistent with the weakest-link property of the control architecture.

Engagement with the external auditor on preventive control is a further implementation dimension. External auditors in EMM jurisdictions have increasingly engaged with treasury control as part of audits of financial reports, particularly where derivative accounting under IFRS 9 or local equivalents is material. Early engagement with the external auditor on the design and testing of preventive controls reduces the risk of late-cycle audit findings and supports the transition from substantive to controls-reliance audit strategies. The engagement should include joint scoping of control testing, agreement on the evidence that will be produced by preventive controls, and periodic review of control-operation exceptions (Bartram, 2008; Rossi, 2013).

Technology selection is a separate implementation consideration. The choice between treasury management system platforms (for example, SAP Treasury and Risk Management, Kyriba, FIS Quantum, ION) carries implications for the functional coverage of the preventive elements, for the total cost of ownership, and for the integration with the broader finance and IT architecture. EMM deployments frequently select less functional platforms on cost grounds and subsequently encounter limitations in exposure identification, automated execution, and settlement matching that compromise the preventive orientation of the control framework (Brown, 2001; Marshall, 2000). The technology decision should follow the maturity diagnostic produced by the framework, rather than precede it, so that the platform selected is fit for the target-state control architecture.

Staff capability is a further implementation consideration. Treasury staff in EMM contexts are frequently generalist finance professionals whose treasury-specific training is thin, and the availability of specialist treasury qualifications in local markets is limited. Investment in staff development, through formal qualification programmes (for example, the Association of Corporate Treasurers qualifications, the CTP qualification) and through secondments to treasury centres of excellence, is a precondition for the effective operation of the preventive elements. The budget for capability development is typically underestimated in treasury transformation programmes, and the long lead times from investment to realised capability mean that development activities should commence ahead of technology deployment (Dolde, 1993; Rawls & Smithson, 1990; Smith *et al*., 1989).

The approach to measurement deserves specific attention. Preventive control maturity, as conceptualised in the framework, requires a measurement instrument that captures both the design quality of each element (policy specification, instrument availability, settlement infrastructure) and the operational effectiveness of each element (compliance with policy, absence of policy breaches, settlement-failure frequency). The composite maturity measure should emphasise the minimum across elements, consistent with the weakest-link property of the architecture. Practitioner applications of the measurement instrument should use a multi-observer approach in which different organisational perspectives (treasury line management, second-line risk, internal audit) provide independent assessments of each element, with triangulation through reference to objective operational metrics where available.

A final implementation consideration concerns the integration of preventive FX control with the broader enterprise risk management architecture. The framework positions FX control as an embedded element of enterprise risk management, not as a standalone treasury activity, and the implementation approach should reflect this integration. The governance arrangements for FX control should be consistent with, and feed into, the enterprise-level risk governance arrangements; the information produced by FX control should be accessible to the enterprise risk management function and should contribute to the enterprise-level risk picture presented to the board; the investment in FX-specific technology should be consistent with the broader enterprise risk management technology architecture (COSO, 2017; Hopkin, 2018; Sanni *et al*., 2020). Integration of this kind requires explicit attention during implementation; it does not emerge automatically from the deployment of the preventive elements in isolation.

Interaction with the tax function is a further implementation dimension that warrants explicit attention. Hedging transactions frequently have tax consequences that differ

between jurisdictions, and the tax-efficiency of the hedging programme depends on the design choices made at the policy layer and on the execution pattern at the transactional layer. Coordination between treasury and tax functions, operationalised through joint policy review and through early engagement on new hedging instruments or new jurisdictions, reduces the risk of tax-adverse hedging arrangements and supports the overall value-creation objective of the programme. The coordination is particularly important for EMMs operating across multiple jurisdictions with heterogeneous tax treatment of derivative instruments (Graham & Rogers, 2002; Nance *et al*., 1993).

Integration with the accounting function is similarly important. Derivative accounting under IFRS 9 or analogous standards requires specific documentation of hedge relationships, effectiveness testing at inception and periodically, and structured treatment of hedge ineffectiveness in financial statements. Failure to meet the accounting documentation requirements produces hedge designations that do not qualify for hedge accounting treatment, with consequent earnings volatility that defeats one of the objectives of the hedging programme. Coordination between treasury and accounting, operationalised through shared documentation templates and through periodic review of hedge-accounting positions, avoids these difficulties and supports the integrity of the financial reporting (DeMarzo & Duffie, 1995; Wong, 2000).

The interaction with the internal audit function is a further consideration. Internal audit provides independent assurance over the operation of the preventive elements, and its engagement should cover the design effectiveness of the elements, the operational effectiveness across a sample of transactions, and the remediation of identified deficiencies. The internal-audit scope for treasury should be articulated in the annual audit plan and should be coordinated with external-auditor testing to avoid duplication. Internal audit findings on treasury operation should feed into the governance reporting received by the audit committee and should inform the continuous improvement of the preventive control architecture. Mature internal-audit engagement with treasury is a distinguishing feature of high-maturity EMM treasury functions and should be an explicit objective of treasury-transformation programmes.

8. Conclusion

This article has developed a conceptual model of preventive FX treasury control for emerging market multinationals. The model positions FX control as a preventive rather than detective activity, specifies five preventive control elements (exposure identification, policy and governance, instrument and counterparty selection, execution discipline, and settlement control), and maps each element to the distinctive constraints facing EMMs. Six propositions link preventive control maturity to firm-level outcomes, each amenable to empirical testing.

Three priority empirical directions follow. First, comparative studies of FX control maturity across EMMs in Sub-Saharan Africa, Southeast Asia, and Latin America would clarify the extent to which the framework's predictions vary by regional context, and would identify the EMM-specific constraints that operate most strongly across regions. Second, investigation of the interaction between central-bank capital-flow policies and corporate hedging cost would extend the framework to cover the policy-environment dimension that operates on all EMM treasuries simultaneously. Third, measurement of the effect of internal FX policy codification on hedging-decision latency would quantify the operational benefits of the governance layer of the framework and support practitioner investment decisions.

For practitioners, the framework offers a diagnostic instrument for treasury control assessment and an organising vocabulary for treasury-transformation programmes. For researchers, it offers testable propositions and a structured vocabulary that supports the cumulative development of empirical evidence on FX control in EMM contexts. The cumulative contribution is intended to raise the analytical precision of both practitioner diagnosis and academic investigation of a topic whose policy and economic importance is substantial and growing.

The broader implications for the treasury function in EMM contexts extend beyond the specific FX-risk application developed in this article. The preventive-control orientation, the five-element architecture, and the governance-layer emphasis together define a design approach that generalises to other treasury-related risks, including interest-rate risk, commodity-price risk, counterparty-credit risk, and liquidity risk. Each of these risk types can be examined through the preventive control lens, and each can be mapped to a corresponding set of preventive elements. Subsequent research should examine the extent to which the five-element architecture transfers to these adjacent risk types and the modifications required by their specific features, with a view to developing an integrated preventive-control architecture for the full treasury risk portfolio.

The article also speaks to the broader discourse on the role of treasury in corporate value creation. Treasury functions have historically been treated as cost centres providing operational support to the broader business, with value-creation responsibility residing in revenue-generating divisions. The framework developed here positions treasury as a value-creation function in its own right, through the reduction of earnings volatility, the preservation of investment capacity, the protection of the firm's operational footprint from currency-stress events, and the support of the firm's broader financial flexibility. The value-creation framing has material implications for the resources allocated to treasury, for the seniority of the accountable executive, and for the board-level attention given to treasury performance.

Policy and regulatory implications also warrant brief attention. Central banks and financial-sector regulators in EMM jurisdictions set the conditions within which corporate FX risk management operates, through their choices on exchange-rate regime, capital-account regulation, and permissible hedging purposes. Constructive engagement between corporate treasurers, regulators, and central-bank staff on the operational implications of regulatory choices can produce outcomes that preserve the regulatory objective while reducing unnecessary friction in corporate hedging operations. The framework developed here, by making the specific EMM constraints on FX control explicit, provides a vocabulary for this engagement that supports productive rather than adversarial interactions between the corporate and regulatory communities (IMF, 2016; Kaminsky & Reinhart, 1999).

The contribution ends on a note of realistic ambition. The framework does not claim to resolve all open questions on FX risk management in EMM contexts, and the conceptual nature of the argument means that empirical validation across

multiple contexts remains to be undertaken. But the vocabulary and the architectural choices developed here are intended to support a cumulative research programme that can address those open questions over subsequent years, with measurable improvements in both the academic understanding and the practitioner practice of an increasingly important dimension of corporate financial management in emerging-market contexts.

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