

# Reconciliation Control and Financial Workflow Redesign in Emerging Market Organizations: A Conceptual Framework

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*Abstract- Reconciliation controls occupy a pivotal position in the assurance architecture of financial reporting, yet in emerging-market organisations they frequently remain manual, fragmented, and under-institutionalised. This article develops a conceptual framework linking reconciliation control design to end-to-end financial workflow redesign, drawing on the internal control literature, business process redesign, and evidence on enterprise resource planning (ERP) in emerging markets. The framework distinguishes four dimensions of reconciliation maturity: data-source completeness, frequency, automation, and ownership, and maps each dimension to specific workflow levers (standardisation, system integration, segregation of duties, and exception management). It proposes that weaknesses in reconciliation control are, in emerging-market contexts, often symptomatic of prior workflow fragmentation rather than causes of reporting failure in themselves, and that durable improvement therefore requires joint redesign of the reconciliation and the surrounding process. Propositions derived from the framework are set out in a form testable through case-study and survey research. The article concludes by identifying three priority empirical questions: the effect of reconciliation ownership on exception-resolution time, the moderating role of ERP coverage on reconciliation-error frequency, and the interaction between statutory audit scope and reconciliation-control maturity. The framework contributes to practitioner and academic literatures by providing an explicit design theory for reconciliation as a control element rather than as an operational residual.*

**Keywords:** Reconciliation Controls, Internal Control, ERP, Emerging Markets, Financial Workflow Redesign, COSO Framework, Process Automation

## I. INTRODUCTION

Reconciliation is the control activity through which the completeness and accuracy of financial records is established against independent sources of evidence. Bank reconciliations against statements from financial institutions, intercompany reconciliations across entities in a consolidated group, subledger-to-general-ledger reconciliations, and reconciliations of payroll, receivables, and inventory records against operational systems together comprise the evidentiary backbone of the financial close. Where reconciliations are complete, frequent, automated, and owned, they generate the independent attestation that underwrites financial statement reliability. Where they are not, closing cycles lengthen, audit adjustments proliferate, and material weakness findings become more likely (Ashbaugh-Skaife et al., 2008; Bedard et al., 2009; Doyle et al., 2007; Kinney, 2005).

In emerging-market organisations, the reconciliation function is frequently under-developed relative to the scale and complexity of the underlying operations. Manual reconciliation processes coexist with partial enterprise resource planning (ERP) coverage. Ownership is ambiguous between accounting, treasury, and operations. Reconciliation frequency is often aligned to the statutory reporting calendar rather than to the risk profile of the underlying balance. Exception resolution procedures are informal and rarely instrumented (Huang et al., 2004; Huang & Palvia, 2001; Seddon et al., 2010). The observable consequences include elongated close cycles, high audit adjustment volumes, and a pronounced sensitivity of reported earnings to the timing and

diligence of reconciliation work. Under integrated audit standards (PCAOB, 2007), the regulatory consequences of these weaknesses are increasingly material, and continuous-assurance techniques have been proposed as a complementary architecture to the periodic-reconciliation baseline (Vasarhelyi et al., 2004). Adjacent work on enterprise IT support, operating-system integration, and data-driven executive decision systems has emphasised that reconciliation performance is shaped by the operational readiness of the surrounding technology stack (Lawal & Oduleye, 2019; Okeke et al., 2019a; Okeke et al., 2019b).

This article develops a conceptual framework that positions reconciliation control as one component of an end-to-end financial workflow, rather than as an isolated control activity. The framework draws on three literatures. The internal control literature, codified in the COSO frameworks (COSO, 2013) and the IIA’s Three Lines Model (IIA, 2013), provides the taxonomy of control activities and responsibilities. The business process redesign literature (Davenport, 1993; Hammer & Champy, 1993) provides the redesign methodology. The ERP implementation literature in emerging-market contexts (Huang et al., 2004; Rajapakse & Seddon, 2005; Seddon et al., 2010) provides the environmental context within which reconciliation controls operate.

The article is organised as follows. Section 2 sets out the theoretical foundations. Section 3 examines the recurring challenges in reconciliation processes in emerging-market organisations. Section 4 analyses the workflow inefficiencies that propagate from weak reconciliation. Section 5 presents the conceptual framework linking reconciliation dimensions to workflow levers. Section 6 discusses workflow redesign strategies. Section 7 addresses governance and implementation considerations. Section 8 concludes and identifies priority empirical questions.

The contribution is conceptual rather than empirical. By providing a design theory of reconciliation as a control element embedded in a broader workflow, the framework offers testable propositions for subsequent empirical research and a diagnostic instrument for practitioners undertaking close-process improvement programmes. The framework also addresses a gap in the literature, which has generally treated

reconciliation as a secondary control activity and has under-examined the interaction between reconciliation quality and workflow design.

The conceptual architecture of the framework is summarised in Figure 1. Reconciliation maturity is treated as a multi-dimensional construct, and each dimension is mapped to a corresponding workflow lever that either enables or constrains improvement. The framework operates at two levels: the individual reconciliation (e.g., a bank reconciliation for a specific account) and the aggregate reconciliation portfolio (the set of reconciliations performed in each close cycle).

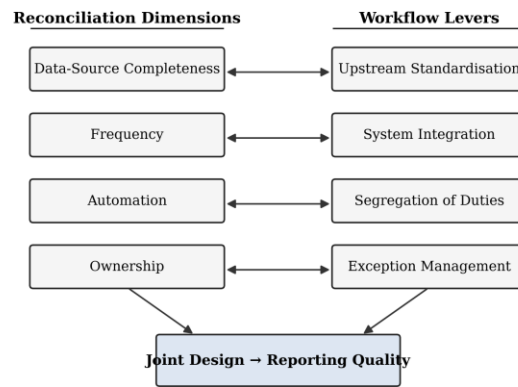


Figure 1. Conceptual architecture of reconciliation control and financial workflow redesign. The framework maps four reconciliation dimensions to corresponding workflow levers.

## II. THEORETICAL FOUNDATIONS

The 2013 update of the COSO Internal Control Integrated Framework (COSO, 2013) organises internal control around five components: control environment, risk assessment, control activities, information and communication, and monitoring. Reconciliation is explicitly categorised as a detective control activity, operating as a compensating control where preventive controls are incomplete and as a monitoring input into the evaluation of control effectiveness. The 2017 Enterprise Risk Management framework (COSO, 2017) elaborates the link between control activities and organisational strategy, providing a conceptual grounding for the view taken in this article that reconciliation design should reflect

risk appetite and strategic materiality rather than uniform procedural templates.

The Three Lines Model of the Institute of Internal Auditors (IIA, 2013) clarifies the allocation of responsibility for control design, operation, and assurance. In a mature deployment, first-line operational management owns the design and execution of reconciliations, second-line control and compliance functions monitor their operation, and third-line internal audit provides independent assurance over the effectiveness of the reconciliation control environment. The model is normative rather than descriptive, and empirical evidence suggests that in emerging-market organisations the three lines are frequently not cleanly separated, with reconciliation work sometimes performed by finance operations without clear second-line oversight (Chambers & Odar, 2015).

The business process redesign tradition, developed by Davenport (1993) and Hammer and Champy (1993) and extended by later contributors (Harmon, 2014), emphasises the end-to-end view of work and the use of information technology as a redesign enabler rather than an automation overlay on legacy processes. Applied to financial processes, the tradition implies that reconciliation design should be integrated with the upstream operational processes that generate the data being reconciled. Fragmentation in upstream processes propagates downstream into the reconciliation function, and piecemeal automation of reconciliation without upstream redesign typically produces diminishing returns. A parallel organisational-change literature, developed by Laughlin (1991), distinguishes reorientations that affect core organisational archetypes from first-order changes that leave archetypes intact, and the distinction is useful for reconciliation reform because it clarifies the conditions under which technical redesign will be reinforced or blocked by the underlying organisational settlement.

The ERP implementation literature in emerging markets provides the final theoretical input. Studies of ERP adoption and post-adoption use in emerging-market contexts (Huang et al., 2004; Seddon et al., 2010; Rajapakse & Seddon, 2005) identify recurrent patterns of partial implementation, persistent parallel systems, and low utilisation of native reconciliation

functionality. These patterns limit the workflow redesign envelope and condition the effectiveness of reconciliation controls. The literature also provides evidence on the managerial and organisational factors associated with higher utilisation of ERP control functionality, which informs the implementation considerations in Section 7. Adjacent work on enterprise data-protection governance and on comparative cross-border data-protection regimes identifies parallel challenges in the control environments within which reconciliation technologies operate (Mbonu et al., 2018; Mbonu et al., 2019).

A separate theoretical strand, the accounting information systems (AIS) literature, has examined the relationship between enterprise system adoption and management accounting change. Scapens and Jazayeri (2003), Dechow and Mouritsen (2005), and Granlund and Malmi (2002) document the uneven and context-dependent effects of ERP adoption on management accounting practice. The AIS literature complements the internal control literature by offering a richer account of how system-embedded control functionality interacts with organisational routines and with the professional identities of the accounting and finance staff who operate the reconciliation function (Berry et al., 2009). Earlier work on the limitations of periodic cost-accounting information in changing manufacturing environments anticipated the move toward integrated and near-real-time systems that has reshaped the reconciliation landscape (Kaplan, 1990).

The continuous-assurance tradition (Alles, 2015; Brown-Liburd et al., 2015; Krahel & Titera, 2015; Kuhn & Sutton, 2010; Moffitt et al., 2018; Vasarhelyi et al., 2004) provides the fourth theoretical input. Continuous assurance proposes that reconciliation and other detective controls operate on near-real-time rather than periodic cycles, supported by automated monitoring of transaction flows and by exception-based attention allocation. Continuous assurance is an aspirational architecture in most emerging-market organisations but the literature offers useful templates for the medium-term direction of reconciliation reform. More recent work on artificial intelligence in accounting and audit extends the continuous-assurance argument into territory where machine-

learning classifiers augment or partially substitute for rule-based reconciliation logic (Sutton et al., 2016).

Table 1 summarises the four theoretical foundations of the framework and their implications for the analysis of reconciliation control in emerging-market organisations.

Table 1. *Theoretical foundations of the framework and their implications for reconciliation control in emerging-market organisations.*

Tradition	Central claim	Implication for reconciliation design
Internal control (COSO)	Control activities should operate within a five-component framework.	Reconciliation should be categorised as a detective control with defined monitoring linkage.
Business process redesign	Information technology enables end-to-end redesign.	Upstream standardisation precedes downstream automation.
AIS and ERP implementation	System effects on practice are uneven and context-dependent.	Partial ERP coverage conditions the reconciliation redesign envelope.
Continuous assurance	Detective controls can operate on near-real-time cycles.	Period-end close compression supports medium-term target architecture.

### III. RECONCILIATION CHALLENGES IN EMERGING-MARKET ORGANISATIONS

Reconciliation challenges in emerging-market organisations fall into four recurring categories. The first is data-source incompleteness, in which the independent sources required for reconciliation are

themselves unreliable or incomplete. Bank statements may be delivered in non-standard formats; intercompany counterparties may operate on different ERPs; operational systems for inventory or receivables may not be reconciled to the general ledger as designed. The incompleteness is sometimes structural, reflecting underlying gaps in the system landscape, and sometimes behavioural, reflecting low priority assigned to reconciliation inputs by upstream process owners.

The second category is manual effort intensity. In the absence of automated matching and exception engines, reconciliation work is performed through spreadsheet-based manipulation of exported system data. This approach scales poorly. Volumes rise faster than reconciliation capacity, reconciliations accumulate backlog in peak periods, and the quality of exception investigation falls as a function of pressure on the reconciliation team (Kinney, 2000; Messier et al., 2017). Spreadsheet-based reconciliation also generates its own control weaknesses, including version-control risks and reliance on key personnel whose absence disrupts the process. Event-log analysis and automated incident-response architectures, developed in the adjacent enterprise-IT operations literature, offer techniques that can be extended to subledger reconciliation environments (Mbonu et al., 2019).

The third category is ambiguous ownership. Where responsibility for specific reconciliations is not clearly assigned between accounting, treasury, operations, and finance shared services, reconciliations either fall through the ownership gap or are performed redundantly by multiple teams without a single definitive output. Ambiguous ownership is a consistent finding in post-implementation reviews of ERP deployments in emerging-market multinationals (Huang et al., 2004; Rajapakse & Seddon, 2005), and it correlates with higher rates of audit adjustment and with slower resolution of identified reconciling items.

The fourth category is weak exception management. Reconciliations identify differences; the value of the control depends on how differences are investigated, resolved, and documented. In practice, differences are often aged rather than resolved, with long-standing reconciling items rolling forward indefinitely. The absence of a defined exception-management

workflow, with service-level targets, escalation paths, and documentation standards, means that the reconciliation control does not close the loop from detection to correction (Doyle et al., 2007).

The four categories interact. Data-source incompleteness drives manual effort; manual effort erodes exception management; weak exception management reduces the incentive to invest in data-source quality; ambiguous ownership accelerates all three dynamics. The result is a self-reinforcing pattern of reconciliation weakness that is difficult to disrupt through point interventions. Sustainable improvement requires simultaneous attention to all four dimensions.

The prevalence of each challenge varies with the organisational context. Financial-services firms operating in emerging markets typically experience acute manual effort intensity because of high transaction volumes; consumer-goods manufacturers experience acute data-source incompleteness because of supply-chain complexity; infrastructure and utility firms experience acute ownership ambiguity because of the large number of operational subsystems feeding the accounting ledger. The framework does not prescribe a uniform remediation path; it specifies the dimensions that must be addressed jointly and allows prioritisation to reflect the specific organisational context.

A further contextual factor is the regulatory environment. In jurisdictions with strong statutory audit regimes and credible enforcement, the organisational incentive to invest in reconciliation quality is stronger than in jurisdictions where the audit regime is formal but lightly enforced. Emerging-market jurisdictions vary substantially along this dimension, and the variation helps to explain the observed cross-country differences in reconciliation maturity within otherwise similar multinational groups. A reconciliation reform programme should therefore be calibrated to the regulatory context, with higher-stringency environments absorbing more ambitious reform earlier than lower-stringency environments (Krishnan & Visvanathan, 2007; Power, 1997).

A fifth challenge, not captured by the four primary categories but frequently observed in practice, is the interaction between reconciliation work and period-

end adjustments. Where the organisation relies on late period-end adjustments to resolve reconciliation variances, the adjustments themselves become a source of audit concern, because they are made by senior finance personnel outside the normal control workflow and are often documented only at summary level. Auditors increasingly scrutinise period-end adjustments as a specific risk area, and a high volume of adjustments is treated as an indicator of weakness in the underlying reconciliation and close controls (Messier et al., 2017; Turner & Owosho, 2009).

The relationship between reconciliation challenges and the accounting profession's professional standards has been examined by the International Federation of Accountants, which has emphasised the role of disciplined reconciliation in the delivery of reliable financial reporting (IFAC, 2014). The professional-standards dimension is particularly material in emerging-market contexts where the supply of qualified public-sector and corporate accountants remains thin relative to demand, and where reconciliation work is frequently performed by staff who are still in the early stages of their professional qualification. Strengthening the professional-standards framing of reconciliation, through explicit inclusion in professional-body examinations and in continuing professional development curricula, is a complementary reform that reinforces the organisational-level redesign advanced in this article.

Sectoral variation in reconciliation challenge intensity is a consistent theme in the literature. Financial-services firms face the highest transaction volumes and the most stringent regulatory reporting requirements, and the reconciliation function in these firms is typically the most mature within emerging-market contexts. Manufacturing and consumer-goods firms face the greatest data-source incompleteness arising from supply-chain complexity, and their reconciliation challenges typically centre on inventory-to-ledger and intercompany reconciliations. Extractive-industry firms face distinctive revenue-recognition and royalty-reconciliation challenges that interact with the complex contractual arrangements governing extraction concessions. Telecommunications and technology firms face high volumes of small-value transactions that test the scalability of automated reconciliation engines. Each

sectoral profile suggests a different prioritisation of the four reconciliation dimensions within the framework, and the framework is intended to accommodate the variation rather than prescribe a uniform sectoral response (Chapman, 2005; Grabski et al., 2011).

The cost of reconciliation weakness is frequently understated in managerial decisions because the direct costs (staff time, audit overrun) are visible while the indirect costs (slow closing cycles, misinformed management decisions, reputational damage from restatements) are dispersed across the organisation and attributed to other causes. Empirical work that attempts to quantify the full cost of reconciliation weakness has been limited, but the available evidence suggests that the indirect costs often exceed the direct costs by a substantial factor, and that managerial recognition of the full cost is a precondition for the investment case that supports reconciliation reform. Practitioner surveys conducted by close-management software vendors provide indicative estimates, though their commercial provenance limits their independent authority (Grabski et al., 2011; Morris, 2011).

The organisational culture in which reconciliation work is performed is a further conditioning factor. Where the finance organisation treats reconciliation as a status activity that confers professional credibility on its performers, the quality of reconciliation work and the retention of reconciliation staff both improve. Where reconciliation is treated as a junior or peripheral activity to be escaped at the earliest opportunity, quality suffers and turnover accelerates. Cultural reforms that elevate the status of reconciliation work within the finance organisation, including through the creation of senior reconciliation-specialist career paths and through formal recognition of reconciliation-related achievements, operate alongside the technical and governance reforms to sustain the capability over multi-year horizons (Berry et al., 2009; Chapman, 2005).

Table 2. *Four categories of reconciliation challenge in emerging-market organisations, their symptoms, and their typical upstream causes.*

Challenge	Symptoms	Typical upstream cause
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Data-source incompleteness	Missing statements, format variance, ERP mismatches	Fragmented system landscape; weak master-data governance
Manual effort intensity	Spreadsheet dependence, backlog in peak periods	Absence of automated matching engines
Ambiguous ownership	Gaps and overlaps across teams, duplicated effort	Unclear RACI between shared services and entities
Weak exception management	Aged reconciling items, undocumented resolutions	No workflow platform or escalation protocol

#### IV. WORKFLOW INEFFICIENCIES FROM WEAK RECONCILIATION

Weak reconciliation generates inefficiencies that extend beyond the reconciliation function itself. The most visible is the elongation of the close cycle. Where reconciliations are unfinished at the scheduled close date, the close extends until sufficient reconciliation is completed to permit statement production. In the worst cases, the close extends well into the following period, compressing the time available for analysis and management reporting before the next close begins. The organisation experiences a persistent condition of being in close, which degrades the quality of finance work and erodes the morale of finance staff.

A less-visible effect is the accumulation of suspense and unreconciled balances. When reconciling items cannot be resolved within a closing cycle, they are typically rolled forward, either explicitly as aged reconciling items or implicitly through suspense account growth. Over time these balances become audit risks in their own right, as the passage of time reduces the availability of supporting evidence and raises the cost of resolution. The literature on material

weakness findings consistently identifies aged reconciling items as a leading indicator of future control failure (Ashbaugh-Skaife et al., 2008; Doyle et al., 2007).

Reconciliation weakness also distorts information flows into management decision-making. Where closes are slow and aged balances high, management reporting is produced from preliminary ledger balances that may differ materially from final reported figures. The difference between preliminary and final reporting erodes management confidence in the finance function and, in extreme cases, induces shadow reporting processes within operations that duplicate effort and compound data fragmentation (Davenport, 1998). The broader finance transformation literature has repeatedly identified reconciliation maturity as a foundational capability without which higher-order analytics investments deliver weak returns (Hammer & Champy, 1993; Harmon, 2014).

The interaction between reconciliation weakness and statutory audit is consequential. Auditors operating in environments with weak reconciliation perform more substantive testing and apply larger materiality buffers, both of which raise audit effort and cost. The substantive testing response also produces more audit adjustments, which feed back into the reconciliation function as additional reconciling items that must be investigated and posted. The audit interaction therefore compounds the core reconciliation weakness rather than mitigating it (Kinney, 2005; Krishnan & Visvanathan, 2007).

The propagation of reconciliation weakness into other financial controls is a further concern. Where reconciliations are unreliable, the monitoring function of the broader control framework is compromised, because reconciliations are the primary source of information about whether other controls are operating as intended. Reconciliation weakness therefore reduces the effectiveness of the control environment as a whole, not only of the reconciliation activity itself (Bedard et al., 2009; Klamm & Watson, 2009). The causal direction is usually from reconciliation weakness to broader control weakness rather than the reverse, which explains why reconciliation remediation typically produces disproportionate improvements in overall control assessments.

Reconciliation weakness also has downstream consequences for management reporting integrity. When ledger balances are not reliably reconciled, management reports produced from those balances inherit the underlying uncertainty. Over successive cycles, the accumulated uncertainty degrades the information value of management reporting and erodes the capacity of senior management to act on operational signals. In multinational groups, the problem compounds through consolidation: unreconciled balances at entity level become unreconcilable variances at group level, and the group controller is forced to absorb variances into centrally managed adjustments that further obscure the underlying operational reality (Dechow & Mouritsen, 2005; Granlund & Malmi, 2002).

The emerging data-analytics literature in accounting has begun to examine reconciliation weakness through a different lens. Where ledger-to-subledger mismatches can be analysed at transaction level across large data volumes, pattern-recognition techniques identify specific classes of reconciling item and their likely upstream causes. Such analyses have been shown to reduce the time from exception identification to root-cause diagnosis, and to support the prioritisation of redesign interventions (Alles, 2015; Hunton & Rose, 2010; Vasarhelyi et al., 2004). In emerging-market contexts, the availability of the required data volumes and the analytical capacity within the finance function remain constraints on the adoption of these techniques, but the trajectory is set.

Finally, reconciliation weakness interacts with workforce and organisational design in ways that are under-examined in the existing literature. Where reconciliation work is perceived as low-status and purely remedial, retention of finance staff into reconciliation roles is challenging, and the professional development of reconciliation accountants is neglected. The consequence is a persistent quality gap between the accountants working on reconciliations and those working on analytic or planning tasks, even within the same finance organisation. Addressing this gap requires deliberate professional-development design that positions reconciliation competence as a foundation of broader finance expertise rather than as a peripheral

activity to be minimised (Kemp & Low, 2008; Prawitt et al., 2009).

A related concern is the feedback between reconciliation weakness and group-level financial reporting integrity. In multinational groups consolidating from multiple emerging-market subsidiaries, the group controller often becomes the last line of defence against unreconciled variances that have not been resolved at subsidiary level. Group-level absorption of unresolved variances into topside adjustments, consolidation overlays, and late-posted entries masks the underlying operational quality concerns at subsidiary level and creates a dependency of group reporting on the personal knowledge of a small number of senior finance staff. Breaking this dependency requires subsidiary-level remediation of the reconciliation weaknesses rather than continued group-level compensation, and the framework advanced here supports the diagnostic and programmatic basis for the subsidiary-level work.

V. CONCEPTUAL FRAMEWORK

The framework specifies four dimensions of reconciliation maturity and maps each dimension to a corresponding workflow lever. The dimensions and levers are summarised in Figure 2, and the detailed mappings are elaborated in the subsections that follow. The synthesis draws on the cross-referenced body of work in the information systems and accounting information systems literatures, and the review protocol used to identify the foundational sources followed conventions for rigorous literature-review documentation (Vom Brocke et al., 2009). Interactive and standards-based reporting architectures, including XBRL-enabled reconciliation exchanges, are increasingly relevant to the frequency and automation dimensions of the framework (Taylor & Dzuranian, 2010).

	Upstream Standard.	System Integration	Segregation of Duties	Exception Management
Data	XX	X		
Frequency		XX		X
Automation	X	X	XX	X
Ownership			X	XX

XX = primary linkage X = secondary linkage

Figure 2. Reconciliation maturity model mapping four reconciliation dimensions to four workflow levers. The joint design space is the cross-product of the two axes.

Data-source completeness captures the availability and quality of the independent evidence against which ledger balances are reconciled. The corresponding workflow lever is upstream standardisation, including standardised master data, standardised posting keys, and standardised external-party interfaces. Without upstream standardisation, the reconciliation function operates against a moving target, and gains from downstream automation are eroded (Davenport, 1993; COSO, 2013).

Frequency captures the cadence at which reconciliations are performed. The corresponding workflow lever is system integration, because frequency is bounded below by the effort cost of each reconciliation cycle, and system integration reduces that cost. Where integration is high, frequency can approach continuous, and reconciliation becomes a near-real-time detective control. Where integration is low, frequency is limited by the effort that can be sustained at each cycle, and reconciliation tends to converge on the minimum required by the reporting calendar.

Automation captures the degree to which reconciliation matching, exception flagging, and documentation is performed by configured system logic rather than by manual effort. Specialist reconciliation software (for example, BlackLine, Trintech, Oracle ARCS), ERP-native reconciliation modules, and robotic process automation (RPA) overlays offer increasingly complete automation options. The corresponding workflow lever is segregation of duties, since automation enables the

separation of reconciliation preparation from reconciliation review without increasing headcount, thereby strengthening the control without undermining efficiency (IIA, 2013).

Ownership captures the clarity of assignment of responsibility for each reconciliation and for the overall reconciliation portfolio. The corresponding workflow lever is exception management, because ownership is operationalised through the assignment of specific exceptions to specific owners with specific resolution timelines. Where exception management is weak, ownership becomes an abstract attribute rather than an operational discipline (COSO, 2013; IIA, 2013).

The four dimensions interact multiplicatively rather than additively. An organisation that achieves high maturity on three dimensions but remains weak on the fourth will realise only the value of the weakest dimension. This interaction is the core proposition of the framework, and it implies that reconciliation improvement programmes must address all four dimensions in parallel, even if the depth of investment on each dimension can vary with the organisational context.

The multiplicative interaction has specific implications for diagnosis and programme design. Where organisations diagnose only the dimension that is most visibly weak and invest disproportionately in that dimension, they frequently find that overall reconciliation performance does not improve commensurately. The surrounding dimensions bound the achievable improvement, and the under-invested dimensions become the new binding constraint. A diagnostic approach that examines all four dimensions jointly, even where the intervention is concentrated on one, produces more sustainable improvement trajectories (Chapman, 2005; Rom & Rohde, 2007).

The framework also generates a maturity scale with five levels, paralleling the conventions of the Capability Maturity Model Integration and its derivatives. Level 1 (initial) describes organisations with no explicit reconciliation policy and ad-hoc reconciliation practices. Level 2 (managed) describes organisations with defined reconciliation policies but limited automation and informal exception management. Level 3 (defined) describes

organisations with documented reconciliation workflows, partial automation, and defined exception-management protocols. Level 4 (quantitatively managed) describes organisations with full workflow automation, metric-driven exception management, and audit-committee oversight of reconciliation maturity. Level 5 (optimising) describes organisations with continuous-assurance deployments, analytical detection of reconciliation anomalies, and continuous improvement of the reconciliation architecture (Brown-Liburd et al., 2015; Kogan et al., 2014).

The framework makes three falsifiable propositions. Proposition 1: in organisations with transaction volumes above a defined threshold, reconciliation ownership clarity (defined as the presence of a named process owner with documented RACI responsibilities and a direct reporting line to the CFO or equivalent) is associated with at least a 40 per cent reduction in mean exception-resolution time, controlling for transaction volume and reconciliation complexity. The proposition is disconfirmed if ownership-clarity variables show no significant effect on resolution time once volume and complexity are held constant. Proposition 2: the moderating effect of ERP coverage on reconciliation-error frequency is non-linear and inverted-U-shaped, with error reductions maximised at 60–80 per cent transaction coverage and attenuated at both lower and higher coverage levels due to boundary-effect errors at the interface between ERP and non-ERP processes. The proposition is disconfirmed if the moderation effect is monotonic or absent. Proposition 3: organisations that invest in all four reconciliation dimensions in parallel over a 24-month window realise improvements in audit adjustment volume at least twice as large as organisations that invest sequentially, even when total investment expenditure is held constant. The proposition is disconfirmed if sequential-investment organisations match or exceed parallel-investment outcomes over the same window.

A further conceptual contribution of the framework is the explicit treatment of the interaction between reconciliation and the surrounding workflow. Earlier frameworks, including those embedded in ERP-vendor reference architectures, treat reconciliation as a standalone activity with defined inputs and outputs. The framework developed here treats reconciliation as

an embedded design element of the workflow, with maturity shaped jointly by the reconciliation-specific dimensions and by the workflow context. This view aligns with the broader process-redesign literature (Davenport, 1993; Hammer & Champy, 1993; Weske, 2012) and differs from purely control-oriented treatments of reconciliation by recognising that the workflow in which reconciliation operates is a first-order determinant of its effectiveness.

The data-source completeness dimension deserves extended treatment because it is the most frequently neglected of the four in practice. Incomplete data sources produce reconciliation exceptions that cannot be resolved by any amount of downstream effort, and the accumulation of unresolved exceptions erodes confidence in the reconciliation function as a whole. Investment in data-source completeness begins with an inventory of the reconciliation population and an assessment of which reconciliations have complete, timely, and reliable independent evidence, and which do not. For reconciliations whose data sources are incomplete, the remediation pathway typically involves either direct investment in upstream data quality (master-data governance, system integration, external-party interface standardisation) or acceptance that the reconciliation in question cannot serve as an evidentiary control and must be supplemented by compensating controls. The choice between the two options is a governance decision that cannot be delegated to the operational reconciliation function (Morris, 2011; Rom & Rohde, 2007).

The frequency dimension interacts with the risk profile of the reconciled balance in ways that practitioners frequently fail to articulate explicitly. High-risk balances (bank accounts, intercompany positions, tax liabilities) warrant higher reconciliation frequency than low-risk balances (depreciation schedules, prepayments amortised on fixed templates). The framework does not prescribe a uniform reconciliation frequency but instead suggests that frequency should be calibrated to risk, with the calibration documented in the reconciliation policy and reviewed periodically as the risk profile changes. Frequency calibration requires the organisation to articulate its risk profile explicitly, which is itself a valuable governance discipline that strengthens the broader control environment (Bedard et al., 2009; Kinney, 2005).

The automation dimension interacts with segregation of duties in a specific operational way that the framework highlights. Fully automated reconciliation, in which matching and exception flagging are performed by configured system logic with human intervention reserved for genuine exceptions, creates segregation opportunities that are difficult to achieve in manual environments. The system logic becomes the preparer; the human reviewer becomes the approver; and the separation is enforced by the system's workflow rather than by organisational discipline. This structural separation is more robust than organisational separation because it does not rely on individual-level behaviour to maintain the segregation. Organisations that have achieved high automation maturity therefore typically achieve high segregation-of-duties maturity as a direct consequence (Alles, 2015; Moffitt et al., 2018).

The ownership dimension is the most organisationally sensitive of the four, because it requires reassignment of responsibility across established team boundaries. In many emerging-market finance organisations, reconciliation ownership is distributed across accounting, treasury, operations, and finance shared-service centres in ways that have evolved historically rather than through explicit design. The framework's treatment of ownership as a distinct dimension requiring deliberate attention produces a programme-design prompt: who should own which reconciliations, and how should the ownership assignment be operationalised through role descriptions, performance metrics, and exception-handling protocols? The governance dimension of the framework addresses these questions directly, and its successful application typically requires executive sponsorship above the level at which the historical ownership arrangements were established (Sarens & De Beelde, 2006; Spira & Page, 2003).

## VI. WORKFLOW REDESIGN STRATEGIES

Workflow redesign strategies suggested by the framework fall into three programmes. The first programme targets upstream standardisation. It comprises master-data governance (a single source of truth for customers, vendors, chart of accounts, and cost centres), standardisation of posting keys and journal entry templates, and standardised interfaces to

external parties (banks, tax authorities, insurance providers). Where upstream standardisation is achieved, downstream reconciliation volumes fall structurally, and the remaining reconciliations are materially easier to automate (Davenport, 1993).

The second programme targets reconciliation-specific automation. Specialist close-management platforms offer configurable matching engines, exception workflows, and documentation management. ERP-native modules such as SAP's General Ledger Reconciliation or Oracle's Account Reconciliation Service provide comparable functionality within the core system. Robotic process automation can bridge gaps where reconciliation workflows span multiple systems not natively integrated. Selection between these options should be governed by total cost of ownership, fit with the existing system landscape, and the maturity of the organisation's IT governance (Harmon, 2014; Mbonu et al., 2018). Lessons from the broader ERP-implementation literature bear directly on automation programme design: integration complexity is frequently underestimated in small and mid-cap deployments (Malhotra & Temponi, 2010), state-of-the-art reviews identify common implementation failure modes (Momoh et al., 2010), and critical success factors in international ERP projects highlight the role of executive sponsorship and localised configuration (Plant & Willcocks, 2007).

The third programme targets exception management. It comprises defined reconciliation policies, service-level targets for exception resolution, escalation paths from first-line preparer to second-line review to third-line audit, and a standardised documentation template that enables reconciliations to function as audit-ready evidence. Exception-management reforms can be implemented in parallel with, or prior to, automation investment, and they typically deliver rapid improvement in close-cycle length and audit adjustment volume (COSO, 2013; IIA, 2013).

Sequencing of the three programmes matters. Organisations that begin with automation investment before addressing upstream standardisation frequently find that the automated matching engines cannot perform well against poorly structured input data. Organisations that begin with exception management without addressing the underlying volume of exceptions find that exception-management

workflows become overwhelmed and lose effectiveness. The preferred sequencing is: begin with upstream standardisation; concurrently build exception-management discipline; then invest in automation on the stabilised substrate. Sequencing variations may be warranted where organisational constraints or opportunity windows favour a different order, but deviation from the preferred sequence typically extends the total duration of the programme and reduces the realised benefits.

A fourth strategic dimension, often overlooked in practitioner discussions, is the redesign of upstream operational interfaces. Reconciliation quality is determined in large part by the quality of the inputs that arrive at the reconciliation function. Where upstream operational systems produce inconsistent transaction coding, incomplete party data, or untimely file transmission, reconciliation effort is consumed in the correction of inputs rather than in the production of assurance. Redesign of upstream interfaces, including through formal service-level arrangements with source-system owners and through monitoring of input quality at the point of arrival, can produce disproportionate improvements in downstream reconciliation effectiveness (Davenport, 1998; Morris, 2011).

A fifth strategic dimension concerns the role of continuous-monitoring overlays. Where full continuous assurance cannot be operationalised due to system or organisational constraints, partial continuous-monitoring deployments can address the highest-risk reconciliations on a near-real-time basis while leaving lower-risk reconciliations on a periodic cycle. The selective application of continuous monitoring reduces cost relative to full continuous assurance and focuses resource on the reconciliations where early detection of exceptions most affects risk (Alles, 2015; Kogan et al., 2014; Moffitt et al., 2018). The architecture decision between periodic, selective-continuous, and full-continuous reconciliation should be governed by a structured risk assessment rather than by a uniform policy.

A sixth dimension concerns the organisational location of reconciliation work. Options include distributed operation within business entities, centralised operation in a shared-service centre, and a hybrid of entity-owned reconciliations feeding into a

centralised review function. Each option has implications for the capability requirements, the investment in technology, and the integration with the broader finance organisation. The evidence from shared-service centre implementations in emerging markets suggests that centralisation produces efficiency gains at moderate levels but exhibits diminishing returns and rising control risk at high centralisation; the optimal organisational design is therefore typically a hybrid (Quattrone & Hopper, 2005; Nandi & Kumar, 2016). The broader literature on realising business benefits from enterprise applications reinforces the view that value capture depends on the alignment of system capability with the decision routines that consume system output (Goodhue et al., 2002).

A seventh dimension, increasingly relevant in contemporary practice, concerns the integration of reconciliation with enterprise-wide finance analytics capability. Reconciliation outputs produce transaction-level data that, when consolidated and analysed, can support insights that extend well beyond the control function. Variance-pattern analysis across reconciliation cycles can identify operational inefficiencies in upstream processes; aged-item analysis can identify under-performing counterparties or operational units; automation-uptime analysis can identify system-performance issues that warrant IT attention. Organisations that treat reconciliation as a data source for enterprise-wide analytics, rather than as a control output with limited downstream value, realise disproportionate returns from their reconciliation investments. The emerging generation of finance-analytics platforms supports this integrated use-case directly, and the framework developed here is consistent with the integrated orientation (Sutton et al., 2016; Taylor & Dzurainin, 2010).

An eighth dimension concerns the interaction between reconciliation reform and merger-and-acquisition activity. Multinational groups that grow through acquisition inherit the reconciliation practices of the acquired entities, which typically differ in maturity from those of the acquirer. Post-acquisition integration of reconciliation practices is a recurring challenge that the framework advanced here addresses directly: the four-dimension maturity model provides a common vocabulary for comparing practices across acquirer

and acquired entities, identifying the gaps that the integration programme must close, and sequencing the integration work across the dimensions. Acquisitions that treat reconciliation integration as a post-day-one concern typically produce persistent reporting weaknesses; acquisitions that include reconciliation integration in the day-one plan avoid these weaknesses at moderate cost (Grabski et al., 2011; Harmon, 2014).

The framework also accommodates the increasingly common arrangement in which reconciliation functionality is delivered through cloud-based platforms rather than through on-premises deployments. Cloud-based reconciliation platforms offer advantages in rapid deployment, scalability, and continuous feature availability, but they introduce considerations around data-residency, regulatory compliance, and integration with on-premises source systems that warrant explicit treatment. The framework's treatment of the automation and system-integration dimensions accommodates cloud-based deployments without requiring modification; the operational-governance implications of cloud deployment are addressed through the exception-management and governance layers rather than through changes to the framework architecture itself.

Table 3. *Three workflow redesign programmes, their principal components, and typical cost-benefit profiles in emerging-market deployments.*

Programme	Principal components	Typical cost-benefit profile
Upstream standardisation	Master-data governance, posting-key uniformity	High one-time cost, large recurring benefit
Reconciliation automation	BlackLine, Trintech, SAP GL Rec, RPA overlays	Medium cost, benefit scales with volume
Exception management	SLA definitions, escalation protocols, documentation standards	Low cost, rapid benefit realisation

## VII. GOVERNANCE AND IMPLEMENTATION

Implementation of the framework requires attention to governance, change management, and sequencing. Governance should assign reconciliation as an owned control activity with a designated accountable executive in the finance organisation, typically at the level of group controller or chief accounting officer. The accountable executive's mandate should include first-line design authority, second-line oversight of operation, and the authority to commission third-line audit reviews where material findings arise. A reconciliation policy document should operationalise the governance structure, specifying dimensions of reconciliation maturity targeted by the organisation and the timelines against which progress will be assessed (IIA, 2013).

Change management is consequential because reconciliation reforms alter work roles and reporting lines. The transition from spreadsheet-based manual reconciliation to platform-based automated reconciliation typically reduces the time spent on matching and increases the time spent on exception investigation. Staff whose role has been defined around matching may resist the transition, and the reform programme should include targeted training and role redesign to ensure that the capacity of the team shifts in line with the new work mix. Empirical evidence on ERP implementation in emerging markets consistently identifies change management as a predictor of success, independent of the technical quality of the system deployment (Seddon et al., 2010; Soh et al., 2000).

Sequencing of technical and organisational reform is also consequential. Technical investments in reconciliation platforms deliver full value only where organisational design has been adjusted to utilise the platform capabilities. Conversely, organisational redesign without technical enablement produces fatigue without durable benefit. The preferred sequencing begins with organisational clarification (ownership, policy, exception-management workflow), proceeds through upstream standardisation, and concludes with technical platform deployment. Deviation from this sequencing is common in practice but produces material rework costs.

Technology selection is a particular source of implementation risk. Specialist reconciliation platforms deliver richer functionality but carry integration and licensing overhead; ERP-native modules offer simpler integration but can require upgrades to access full functionality; RPA overlays deliver speed but can produce automation debt if used as a substitute for underlying process redesign. The technology decision should follow, rather than precede, the diagnostic of reconciliation-dimension maturity and workflow-lever readiness set out in Section 5.

Implementation governance arrangements should include regular measurement of reconciliation performance against the four dimensions. Measurement should use a combination of leading indicators (reconciliation completion rates, exception resolution times, aged-item balances) and lagging indicators (audit adjustment volumes, material weakness findings, close-cycle length). The measurement framework should be published within the organisation and should be visible to the audit committee, which should receive a standing report on reconciliation maturity at each committee meeting.

The interaction between reconciliation reform and statutory audit engagement is a further implementation consideration. Where reconciliation reform is sustained over multiple closing cycles, the statutory auditor typically reduces the substantive testing applied to the reconciled balance sheet elements, relying instead on tests of the control design and operating effectiveness. The transition from substantive testing to controls reliance produces audit efficiency gains for the organisation and reduces the disruption of statutory audit on the finance team. The transition is not automatic, however, and requires early engagement with the statutory auditor about the target control architecture and the evidence that will be produced to support controls reliance (Kinney, 2005; Chambers & Odar, 2015).

A dedicated governance dimension concerns the relationship between reconciliation reform and the organisation's broader digital-transformation agenda. Reconciliation platforms are frequently procured as part of wider finance-transformation programmes, and their successful deployment depends on alignment with the chart of accounts design, the master-data

management architecture, and the analytics roadmap. Where these larger programmes are coherent, reconciliation reform benefits from the alignment; where they are fragmented, reconciliation reform can become an island of local improvement that does not connect to the broader direction of the finance function (Grabski et al., 2011; Velcu, 2007).

Budget and resourcing for reconciliation reform typically exceed initial estimates, and the literature on ERP implementation in emerging markets consistently identifies under-resourcing as a leading cause of reform failure (Seddon et al., 2010; Soh et al., 2000). The reform programme should include explicit allowance for technology licensing, implementation services, change management, post-implementation support, and contingency. Where recurring cost absorption cannot be secured from the operating budget, the long-term viability of the reform is at risk, and the programme should be scaled to a level that is sustainable within the available resource envelope rather than extended to a level that exceeds it.

Audit committee engagement over the multi-year reform horizon is an under-examined but consequential governance dimension. Reconciliation reform typically spans two to three years from initial diagnosis to full deployment, and the audit committee oversight span should match that horizon. Committees that receive progress reports only at the conclusion of each calendar year tend to lose visibility over sustained programmes; committees that receive structured quarterly updates against a published milestone plan are more effective at holding the programme to its commitments. The governance architecture should therefore include a defined audit-committee reporting cadence covering programme milestones, realised benefits, identified risks, and forward-look activities (Sarens & De Beelde, 2006; Spira & Page, 2003).

Implementation risk management warrants a dedicated governance mechanism within the reform programme. Reconciliation reforms in emerging-market contexts consistently encounter implementation risks that fall into three categories: technical risks arising from integration challenges with legacy systems; organisational risks arising from resistance to role and workflow changes; and external risks arising from shifts in the regulatory environment, in market

conditions, or in the availability of key personnel. A structured risk register, maintained by the programme management office and reviewed by the programme steering committee on a monthly cadence, provides the instrument through which implementation risks are identified, assessed, and mitigated. The register should be visible to the audit committee, which should receive explicit escalation of risks exceeding defined severity thresholds (Kuhn & Sutton, 2010; Sarens, 2009).

Benefits realisation is a further governance dimension that tends to be under-specified in reconciliation reform programmes. The benefits case for reconciliation investment typically includes both operational benefits (close-cycle compression, audit-adjustment reduction, control-environment strengthening) and strategic benefits (improved management reporting quality, reduced reporting risk, enhanced capacity for analytical investment). The governance architecture should specify how each benefit category will be measured, how baseline measurements will be established ahead of programme deployment, and how the realisation of benefits will be tracked across the post-deployment period. Where benefits realisation is not tracked systematically, the programme's contribution to organisational performance remains uncertain, and the institutional memory of the investment case erodes over time. Robust benefits realisation tracking supports the investment case for subsequent finance-transformation programmes and builds the cumulative evidence base on which practitioners and researchers can draw (Grabski et al., 2011; Velcu, 2007).

A final governance consideration concerns the continuing relationship with external software vendors and professional-services providers whose technology and expertise support the reconciliation function. Vendor management, particularly for cloud-based reconciliation platforms, requires explicit attention to service-level agreements, to data-residency and security requirements, to change-management protocols that govern platform updates, and to exit provisions that preserve continuity of operations if the vendor relationship ends. Professional-services provider engagement, particularly during the implementation phase, requires attention to the transfer of knowledge from consultants to permanent staff and to the avoidance of ongoing dependencies

that elevate long-run cost. Both dimensions warrant explicit treatment in the governance architecture and in the programme plan (Chapman, 2005; Morris, 2011).

## VIII. CONCLUSION

Reconciliation controls in emerging-market organisations are frequently treated as operational residuals rather than as design elements of the broader financial workflow. The consequences are visible in elongated close cycles, accumulated suspense balances, audit adjustments, and the propagation of reporting-quality concerns into investor relations and regulatory oversight. This article has developed a conceptual framework that positions reconciliation as a first-order design problem and maps four reconciliation dimensions to four workflow levers.

The framework generates three priority empirical questions. The first concerns the effect of reconciliation ownership on exception resolution time. The second concerns the moderating role of ERP coverage on reconciliation-error frequency. The third concerns the interaction between statutory audit scope and reconciliation-control maturity. Each question is amenable to mixed-methods investigation using case-study and survey designs, and each would materially advance the empirical evidence on reconciliation control in emerging-market settings.

For practitioners, the framework offers a diagnostic instrument for close-process improvement programmes. The four-dimension maturity model provides a structured way of assessing the current state of reconciliation, and the mapping to workflow levers suggests the specific interventions that will disrupt the reinforcing dynamics of reconciliation weakness. For researchers, the framework offers testable propositions and a structured vocabulary for subsequent empirical work. The cumulative contribution is intended to be a platform from which both practical improvement and academic investigation can proceed on firmer analytical foundations.

The broader implications for the finance function extend beyond the reconciliation activity itself. Reconciliation maturity is, in the framing advanced here, a diagnostic indicator of the maturity of the

broader financial workflow. Organisations that achieve high reconciliation maturity typically exhibit high maturity across adjacent finance capabilities, while organisations that remain weak on reconciliation typically exhibit weakness across the finance function as a whole. The explanation lies in the dependence of reconciliation on upstream process quality, on information-system integration, on organisational discipline, and on governance arrangements, all of which are shared foundations of the broader finance capability set. Reconciliation improvement is therefore not merely a local intervention but a lever for broader finance-function transformation, and the investment case for reconciliation reform should be articulated at the level of the finance function as a whole rather than at the level of the reconciliation activity in isolation.

The article also speaks to an emerging concern in the broader corporate-reporting discourse. As reporting frameworks expand to include non-financial disclosures (environmental, social, and governance indicators, human-capital reporting, climate-related disclosures), the reconciliation concept generalises to cover the verification of non-financial data against independent sources of evidence. The framework developed here for financial reconciliation provides a conceptual template that can be adapted to non-financial reconciliation, with the same four dimensions (data-source completeness, frequency, automation, ownership) applicable to the new reporting domains. Subsequent research should examine the extent to which the financial-reconciliation framework transfers to non-financial reconciliation and the modifications required by the specific features of the non-financial reporting context.

Policy and regulatory implications of the framework are also significant. Financial-reporting regulators, particularly in emerging-market jurisdictions where the professional accountancy infrastructure is still developing, can use the framework as a basis for specifying expectations for reconciliation maturity at regulated entities, and can use the maturity model as a diagnostic instrument in regulatory examinations. Standard-setting bodies responsible for auditing standards can use the framework to structure guidance on controls reliance relating to reconciliation,

extending the integrated-audit concept to accommodate the specific features of reconciliation controls in emerging-market contexts. Professional accountancy organisations can use the framework to structure continuing professional development content for accountants working in reconciliation roles, contributing to the professional-standards reform identified as a complementary dimension of the framework's broader application.

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