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Fundamentals of VBM methodology in company valuation: Linking EVA/CFROI/ROIC with audit analytical procedures and impairment tests

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Abstract

This paper develops a conceptual framework that links Value-Based Management (VBM) metrics to audit analytical procedures and impairment testing. The relevance lies in the growing share of intangible assets (code, user cohorts, network effects), for which traditional audit techniques are insufficient to assess the persistence of growth and the actual returns on capital. The contribution and novelty are a synthesis of EVA, CFROI, and ROIC as an integrated audit coordinate system, paired with procedural guidance for impairment testing and reasonableness checks under high volatility. The framework clarifies how VBM metrics can be embedded in standardized audit steps to make value assessments more transparent and comparable.

***Keywords*:** Value-based management; auditing; company valuation; performance metrics; impairment testing

1. Introduction

Financial technologies have created a layer of the economy where digitized assets, network effects, and instant scalability drive value much faster than real, tangible investments can catch up in reporting. This means greater uncertainty for the investor about the actual return on capital. It calls for reinventing sources of evidence for the auditor. Beyond traditional inventory counts, this may involve testing code controls, analyzing API traffic logs, and modeling cohort resilience to regulatory shocks. In this environment, value-based management becomes the common language among developers, shareholders, and controllers. Throughout this paper, the FinTech sector serves solely as an illustrative example; the methodology is general and not sector-bound. Using a concrete, modern example makes the procedural recommendations more actionable and immediately relatable to auditors and practitioners.

The emergence of Value-Based Management as three complementary trends explains the de facto performance benchmark. First, the concentration of economic surplus: in 2023, the ten largest U.S. public companies generated 69% of the market's aggregate economic income, demonstrating the superiority of approaches that measure added, not merely accounting, profit (Mauboussin & Callahan, 2024). Second, the educational factor: firms that systematically trained managers in VBM logic exhibited higher capitalization relative to industry peers, a result noted in early field studies as well (Haspeslagh et al., 2001). Taken together, these circumstances increased the use of VBM as a performance benchmark, emphasizing ROIC–WACC spreads rather than scale-based growth metrics.

Yet the model itself defines only a theoretical plane; the reliability of the assessment depends on the soundness of its embedded premises. This is precisely where the auditor enters. The audit focus shifts from bottom-line net income to the mechanics of economic-profit computation: the appropriateness of capitalizing R&D, the justification for a technology-risk premium, the choice of β for a platform business model, and the robustness of retention hypotheses (Damodaran, 2025; Grice, 2024; PCAOB, 2025b). Consistent with the PCAOB's emphasis on direct confirmations, the procedures rely on external data custodians and independent benchmarks for discount rates and growth. The new rule underscores that independent confirmation remains a cornerstone, even amid the pervasive digitalization of processes (PCAOB, 2025b). Practice shows that the majority of critical divergences between managerial models and market reality surface precisely when re-examining the cost of capital and long-term growth rates.

Accordingly, VBM has furnished the collective investor with a universal scale for comparing the monetization speed of innovation. Auditors have converted that scale into a reliable instrument of control, reducing the risk of misinterpreting scale growth as value creation. In the context of FinTech projects, where value is often embedded in code and user cohort tables, the synergy of VBM metrics and rigorous audit testing maintains equilibrium between entrepreneurial audacity and the discipline of capital markets.

2. Materials and Methodology

This is a conceptual study based on a structured review of academic and practice-oriented sources and standards. The theoretical base includes works on market-surplus concentration and the institutionalization of VBM logic in corporate governance, which emphasize that these approaches allow the monetization speed of innovations to be compared to the alternative cost of capital (Mauboussin & Callahan, 2024; Haspeslagh et al., 2001). Another body of studies demonstrates that EVA and CFROI better reflect the dynamics of economic value creation than traditional accounting measures (Sanga, 2024; Kohls et al., 2023).

Methodologically, we propose an audit-oriented framework that aligns three indicators, EVA, CFROI, and ROIC, side-by-side within digital business models (Sanga, 2024; Kohls et al., 2023; Damodaran, n.d.). This selection shows that each metric reflects a different dimension of return. ROIC permits a horizontal comparison of asset efficiency (Damodaran, n.d.), CFROI dispels time and inflationary distortions (Nogales & Kukrika, 2025), and EVA expresses profit as an absolute cash surplus after deducting the cost of capital (Sanga, 2024). Their combination minimizes the limitations of any single metric and constructs an integrated coordinate system for audit tests.

In practice, the methodology incorporates international auditing and accounting standards as an external control framework. Foremost are the PCAOB provisions on the obligatoriness of independent confirmations (PCAOB, 2025b), the regulation of analytical procedures and acceptable tolerances (PCAOB, 2024; Thompson, 2024), and the practice of detecting misstatements through impairment testing under IAS 36 (Schöniger et al., 2024). To evaluate the reasonableness of managerial forecasts, the study integrates retrospective and prospective analyses of models, including assessments of scenario resilience and managerial bias (Grice, 2024; Dainelli & Mengoni, 2025). The framework does not generate new primary data; all inferences depend on transparent adjustments (capitalization of R&D, economic depreciation) and independently sourced discount-rate inputs.

3. Results and Discussion

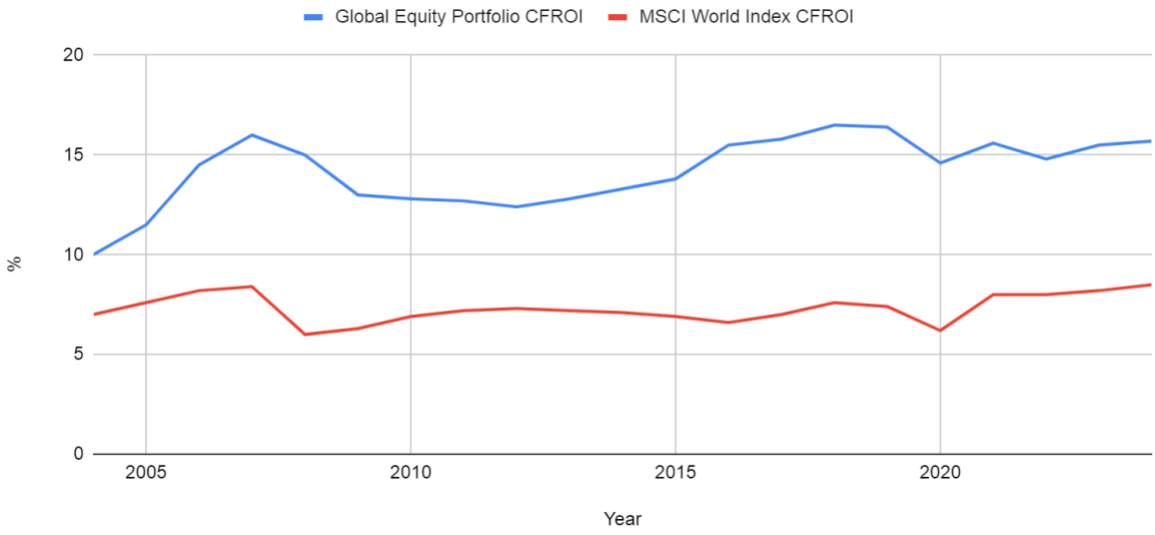
3.1 EVA–CFROI–ROIC as an Integrated Coordinate System for Digital Business Models

To illustrate the principle concretely, consider the FinTech industry as a practical, contemporary example in which code, user cohorts, and network effects often account for the bulk of economic value. For FinTech companies, value is less captured in residual accounting profit and more in assets such as code and network effects that require adjustments to reflect economic returns. Hence, investors and auditors converge on a language in which every unit of capital must earn a return in excess of its alternative cost. In this framework, three anchor metrics, EVA, CFROI, and ROIC, serve as a complementary set of indicators that reduce uncertainty about digital business models.

Economic Value Added reveals the net economic gain after charging the full cost of capital. A recent applied study of an Asian industrial holding showed that a 60-basis-point rise in market value accompanied a 100-basis-point increase in EVA added, thereby confirming that the metric better captures actual value creation than accounting profit (Sanga, 2024). In FinTech projects, where a significant portion of expenditures is recorded as R&D, EVA-based adjustments require management to capitalize costs only when they result in long-term cash flows, rather than treating them as one-time marketing expenses. Auditors should document capitalization criteria, amortization horizons, and back-testing against realized cash flows to mitigate bias.

The cash-flow return on Investment approximates the total internal rate of return from cash flows, thereby avoiding distortions that arise from inflation and differences in accounting policies. In a global panel over 22 years, firms with CFROI above the cost of capital were shown to outperform the market by a statistically significant amount whenever this situation persisted (Kohls et al., 2023). Paradoxically, the metric is infrequently referenced in internal communications yet remains in active use by institutional investors (Battalio et al., 2024). Institutional investors, by contrast, employ it actively: in Generation IM's portfolio, the weighted-average CFROI exceeded 15%, placing the asset set in the top 30th percentile of the global market, as shown in Figure 1 (Nogales & Kukrika, 2025).

Figure 1. CFROI: Global Equity Portfolio vs. MSCI World



Source: Nogales & Kukrika, (2025)

Return on Invested Capital serves as an invariant for horizontal comparison, indicating how much net operating profit each unit of invested capital generates. According to the January dataset, the average ROIC for Computer Services—which captures much of non-bank FinTech—stood at 27.19%, nearly three times the all-industry average (Damodaran, n.d.). Such dispersion

underscores that absolute magnitudes are insufficient: they must be viewed alongside the cost of capital and cash effects.

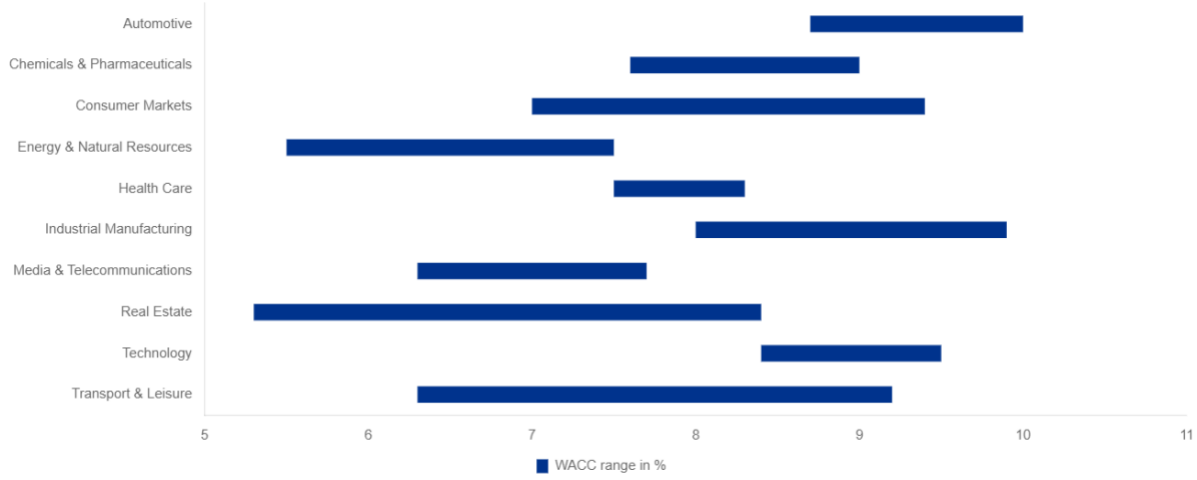
The joint use of EVA, CFROI, and ROIC addresses the weaknesses of any single measure: ROIC establishes a baseline radius of efficiency, CFROI projects it into the temporal and inflationary space, and EVA converts the result into an absolute cash surplus (Sanga, 2024; Kohls et al., 2023; Damodaran, n.d.). By reconciling management models against these three projections, the auditor can identify hidden assumptions, such as an inflated β coefficient, overly optimistic growth rates, or misapplied development capitalization. The triad thus becomes a coherent coordinate system where entrepreneurial optimism meets capital-market discipline, and digital innovation meets testable economic logic.

3.2 Hurdle Rate Discipline: WACC and the ROIC–WACC Spread as Early Warning Signals

Within the logic of the digital economy, the hurdle rate serves as a filter, separating real value creation from accidental growth in scale metrics (Damodaran, 2025; Schöniger et al., 2024). Formally, the hurdle is set by the weighted average cost of capital. For Computer Services, to which international classifiers assign the bulk of non-bank FinTech projects, it was 8.72% as of January 2025 (Damodaran, 2025). This rate represents the investor's alternative: place funds in an asset of equal risk and earn the same percentage effortlessly. While the internal rate of return exceeds that mark, the enterprise accrues economic profit. When the spread compresses, incremental investment is less likely to create value.

Computing the spread between return on invested capital and WACC reveals this moment before accounting recognizes the impairment of intangibles. In the same sector, the median ROIC reaches 27.19% (Damodaran, n.d.), resulting in a positive spread of over eighteen percentage points and helping to explain why 69% of public FinTechs were profitable by the end of 2024—the market rewards capital discipline. The dispersion, however, is vast: in the Financial Services (excluding banks and insurers) subsector, the ROIC is just 0.99% (Damodaran, n.d.), which serves as an early warning signal for the auditor. KPMG practice aligns with this: compression of the ROIC–WACC gap is most often recorded by companies as a trigger for impairment testing under IAS 36 (Schöniger et al., 2024). The workpapers should include the source of the sector WACC, the sensitivity of the spread to discount-rate inputs, and a reconciliation to management's assumptions. As shown in Figure 2, WACC ranges vary noticeably by sector: the lowest occur in real estate and energy (~5.3–7.5%), whereas autos and industrials display the highest cost of capital (~8.7–10%), reflecting differences in risk and asset structure.

Figure 2. WACC by sector



Source: Schöniger et al., (2024)

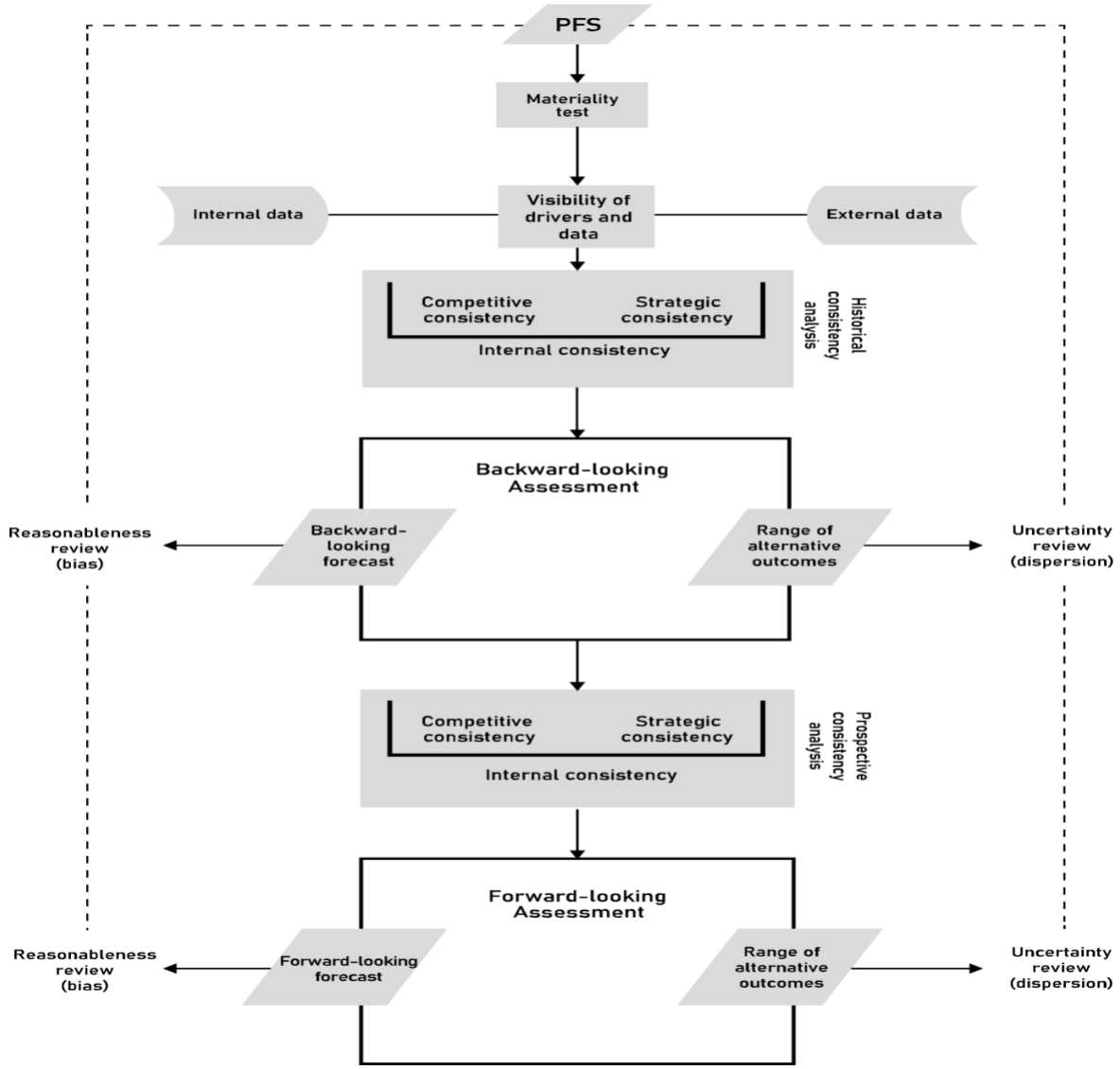
The international standard explicitly permits using WACC as the discount rate for value-in-use but requires substantiating its independence from a firm's specific capital structure. This is a delicate point: management tends to substitute the market anchor with a subjective cheap debt, artificially inflating the spread. By comparing asserted models with sectoral WACC and realized profitability, the auditor can anticipate the latent impairment of code, licenses, or client cohorts before it materializes in the income statement. Thus, the hurdle rate serves as a benchmark for gauging hypergrowth resilience, and the ROIC–WACC spread is a litmus test that instantly changes color when the economic balance of digital assets is disrupted.

3.3 Audit Analytical Procedures: Expectations, Reasonableness Testing, and Variance Investigation

The auditor's first analytical procedures begin at the planning stage: expected values for EVA, CFROI, and ROIC are constructed and immediately overlaid on the sectoral cost of capital. ISA 520 requires that such expectations be based on plausible and predictable relationships in the data (Thompson, 2024); the PCAOB's draft update to AS 2305 clarifies that tolerance must be set not by arbitrary market fluctuations, but by a threshold that does not exceed tolerable misstatement (PCAOB, 2024). In FinTech audit practice, when an internal CFROI forecast promises a double-digit return while the sectoral WACC fluctuates, the auditor constructs an expectation matrix in which each cell indicates how far the projected spread exceeds the minimally acceptable level, establishing a quantitative boundary for investigation, typically within conventional materiality. Tolerance thresholds are set with reference to tolerable misstatement and the predictive strength of the underlying relationship (ISA 520). When management presents its own growth scenarios, the reasonableness test begins (Grice, 2024; Dainelli & Mengoni, 2025). The new guidance on estimates (SAS 143) requires a retrospective review of prior projections and a formal analysis of

managerial bias to filter out intrinsically optimistic premises (Grice, 2024). A 2025 study on reviewing prospective financial statements found that, when compared with an independent reasonable model, most corporate forecasts were overstated, with the discrepancy most often driven by underestimated churn and overestimated adjacency penetration (Dainelli & Mengoni, 2025). Figure 3 illustrates an iterative verification loop for PFS, encompassing materiality and driver transparency, as well as retrospective and prospective assessments with dual reasonableness checks, analysis of historical/prospective consistency, and dispersion of outcomes, to ensure the competitive and strategic coherence of assumptions.

Figure 3. Comprehensive framework for PFS review



Source: Dainelli & Mengoni, (2025)

Workpapers should map each contentious driver to (i) historical volatility bands, (ii) sector benchmarks, and (iii) the specific follow-up action (adjustment or management explanation).

The final step is investigating deviations (Thompson, 2024; PCAOB, 2025a). A recent PCAOB Board member's speech emphasizes that a significant portion of inspection findings still stems from poorly designed or insufficiently probed analytical procedures, including tolerances set too wide, circular dependencies in models, and cursory explanations of gaps between expectations and facts (Thompson, 2024). The statistics are serious: even after notable improvements, the share of inspected audits with significant deficiencies stood at 39% in 2024 (20% for the Big Four) (PCAOB, 2025a). Each unexpected divergence between the expected ROIC and the reported figure must be either explained with independent evidence or disclosed as a potential misstatement. The documentation should include the information source, test logic, computation of actual and threshold variance, and a link to the auditor's subsequent response. Thus, the procedure closes the loop: expectation modeling, reasonableness testing, and variance investigation form a single evidentiary construction, converting abstract value metrics into a precise audit pathway for digital business.

3.4 Hypothetical Case Analysis: Triangulating EVA, CFROI, and ROIC in Audit

Assume AlphaPay is a non-bank payments platform. In management's base case, CFROI is forecast at 18% and ROIC at 22% with a WACC of 10%. Reported figures are: revenue USD 120 million; NOPAT USD 18 million; invested capital (IC) USD 150 million; research and development (R&D) expenses recognized in the period of USD 30 million. The auditor establishes expectations for ROIC, CFROI, and EVA using sector WACC benchmarks and the issuer's historical drivers. Tolerable misstatement (TM) at the financial-statement level is set at USD 1.5 million and allocated across the triad via an expectation matrix; variances that exceed TM or lack a plausible explanatory relationship are scoped for follow-up procedures. To derive economic metrics, the auditor capitalizes development costs in accordance with IAS 38 recognition criteria: 60% of R&D (USD 18 million) qualifies as an intangible asset with a three-year economic life; current-period amortization is USD 6 million. NOPAT is adjusted by +USD 12 million (add-back 18 less amortization 6), yielding adjusted NOPAT of USD 30 million. The net development asset increases IC: the prior unamortized balance of USD 24 million plus the current unamortized addition of USD 12 million, for an adjusted IC of USD 186 million. Consequently, ROIC (reported) = 18/150 = 12.0%, while economic ROIC = 30/186 = 16.1%. For CFROI, the auditor applies economic depreciation to gross investment (assume USD 200 million with an 8% economic depreciation rate); normalization for timing and inflation effects yields an economic CFROI of approximately 13%. The sector WACC baseline is 10%, but external evidence supports a technology risk premium of +200 bps; the audit base WACC is therefore 12%.

EVA and spread diagnostics are as follows: EVA (reported) = 18 − 0.10 × 150 = USD 3.0 million; EVA (economic, audit base) = 30 − 0.12 × 186 = USD 7.68 million. Although a higher discount

rate increases the capital charge, economic NOPAT growth dominates; however, the robustness of this outcome requires sensitivity analysis. A retrospective review indicates prior-year forecasts overstated ARPU by 12% and understated churn by 180 bps. Current retention assumptions (88%) exceed the realized history (82%) without independent corroboration, and the model holds CAC flat despite external evidence of channel cost inflation. In a downside scenario aligned with external benchmarks—retention −5 pp, CAC +10%, and an additional +100 bps technology risk premium—adjusted NOPAT falls to USD 22.5 million, WACC rises to 13%, and IC remains USD 186 million, producing EVA = 22.5 − 0.13 × 186 = −USD 1.68 million. The ROIC–WACC spread compresses from 4.1 pp (base) to 3.1 pp and approaches breakeven under more severe shocks. One-way sensitivities identify first-failure thresholds for non-positive EVA at retention ≤ 78%, WACC ≥ 13.4%, or a gross-margin decline of 3 pp versus base. A tornado analysis ranks retention and the discount rate as the dominant value drivers; G&A productivity and working-capital turns are second-order effects.

Procedural consequences are threefold. First, an impairment indicator is recorded under IAS 36, since EVA becomes negative in a plausible downside; an expanded analysis of recoverable amount (value in use versus fair value less costs of disposal) is warranted, and assumptions must be reconciled. Second, forecast governance requires revising retention and CAC trajectories or providing external substantiation; tolerances for CFROI variances are tightened to TM-consistent bands that reflect the predictive strength of the underlying relationships. Third, model coherence is enforced by reconciling discount-rate inputs to sector WACC and independently sourced premia, and by documenting bridges from reported to economic NOPAT/IC (capitalized development costs and economic depreciation). Workpapers include data sources, formulas, parameter tables, back-testing exhibits, and the specified audit response (requested adjustments, additional procedures, or disclosures). The interpretation is that the EVA–CFROI–ROIC triad reveals a risk that scale metrics may obscure under realistic perturbations of key parameters, economic surplus can be eliminated (Kohls et al., 2023; Sanga, 2024; Dainelli & Mengoni, 2025). The sequence of expectation setting, reasonableness testing, and variance investigation establishes reproducible escalation thresholds, indicating when to challenge management assumptions and to trigger impairment testing, thereby grounding the assessment of digital business models in testable economic logic.

3.5 Impairment Triggers and Sensitivity for Digital Intangibles: From Recoverable Amount to Clean Metrics

Early signs of impairment may be obscured by growth in user and transaction metrics while the cost of capital rises. The auditor first examines the EVA-CFROI-ROIC triad to determine whether the stable, positive gap relative to the weighted-average investor reward has vanished (Damodaran, 2025; Schöniger et al., 2024). If the spread thins or turns negative, this is an indicator warranting reassessment of the recoverable amount under IAS 36. A secondary indicator is the contraction in

cohort retention rates: even a mild but persistent downward drift alters the project's cash-flow forecast and, consequently, pushes management toward impairment testing.

The relevance of this approach is especially clear in the case of FinTech companies, which is used here as an illustrative case to show how the choice between value-in-use and fair value can have immediate, practical consequences. The subsequent dispute concerns the recoverable amount: value in use, reflecting the benefit of continued operation, or fair value less costs of disposal. In FinTech, the first is often higher, because the platform retains network and scale effects even under moderate margin erosion; the second becomes relevant if the project loses its path into the regulatory license ecosystem and must sell technology on a residual basis. By matching the managerial calculation with independent assumptions on market risk premia and cash-flow dynamics, the auditor checks for unsupported terminal-growth assumptions and discount-rate inconsistencies. To avoid relying solely on the forecast, a sensitivity analysis is applied, in which key drivers—active-user growth, spread over the cost of capital, and retention ratio are varied within narrow yet realistic ranges. The margin of safety is the gap between the base valuation, and the nearest parameter set that produces non-positive EVA. If that buffer is thinner than the confidence interval, the auditor records in the working papers the need to either spotlight the risk in the opinion or demand a partial or complete write-down of intangible assets.

Refined tests are impossible without cleansing the operating profit (Grice, 2024). One-off items—such as litigation awards, spatial office optimization, and departures under mutual agreement—are removed from NOPAT, ensuring the measure reflects durable, not episodic, profitability. Research and development are capitalized when the recognition criteria are met (IAS 38); lease-related effects are addressed under IFRS 16. This lengthens the resource horizon while simultaneously expanding the asset base that must be justified based on ROIC. For a correct CFROI, economic depreciation is applied, allocating original outlays not linearly but along the actual consumption trajectory of value; cash flow thus ceases to be a hostage to arbitrary accounting policy. The combination of these adjustments renders the final indicator map transparent. Every line item is tethered to a source of value, and any deviation instantly signals the need to revisit either the forecast or the carrying amount of digital assets.

4. Conclusion

The study proposes an audit architecture tailored to digital business models with high intangibles. Here, value is concentrated not in tangible assets, but in code, user cohort tables, and network effects, rendering traditional assessment methods incomplete and often lagging. Employing a coordinate system anchored in three key metrics—EVA, CFROI, and ROIC—repositions the audit within a space where created value becomes observable and measurable. The EVA–CFROI–ROIC triad forms a coherent frame: ROIC gauges efficiency, CFROI addresses timing/inflation, and EVA measures absolute value creation—together supporting detection of model distortions.

In this context, audit procedures cease to be mechanical reconciliations and become a sequence of steps involving reasonableness checks of hypotheses, retrospective analysis of forecasts, sensitivity testing, and assessment of the margin of safety. Closing these procedures into a loop—from expectation modeling through reasonableness testing to deviation investigation—builds an evidentiary base in which digital innovation is appraised through testable economic logic. The practice of using a hurdle rate based on the weighted average cost of capital reinforces the auditor's role as a filter separating sustainable value creation from short-term growth metrics. This alignment improves the transparency of assumptions and supports investor confidence.

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