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ALAALI COST OF CAPITAL MODEL (ACCM): A MULTI-FACTOR APPROACH TO COST OF CAPITAL ESTIMATION

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ABSTRACT

Introduction: The cost of capital is fundamental to corporate valuation, capital budgeting, financing decisions, and investment appraisal. Conventional approaches such as the Capital Asset Pricing Model (CAPM) and Weighted Average Cost of Capital (WACC) provide established foundations for estimating required returns, but their implementation may not explicitly represent additional firm-specific, market, country, and ESG-related conditions that affect financing environments.

Methods: This study develops the Alaali Cost of Capital Model (ACCM) through a conceptual model-development approach. ACCM retains conventional WACC as its baseline and introduces a Contextual Risk Adjustment (CRA) comprising firm-specific risk, incremental market-condition risk, country risk, and ESG-related risk. The model explicitly distinguishes contextual adjustments from risks already incorporated in conventional WACC inputs to limit double counting. A hypothetical numerical illustration demonstrates the model's operational mechanics.

Results: The illustration shows how a baseline WACC can be systematically adjusted upward or downward according to explicitly identified contextual factors while preserving the contribution of each adjustment. ACCM therefore produces both a baseline capital-cost estimate and an interpretable contextual adjustment.

Discussion: ACCM is proposed as a transparent operational approach to context-adjusted cost-of-capital estimation rather than an empirically validated replacement for WACC or CAPM. Its adjustment coefficients require subsequent empirical calibration and testing.

KEYWORDS: Cost of Capital; Weighted Average Cost of Capital (WACC); Contextual Risk Adjustment; Country Risk; ESG Risk; Firm-Specific Risk; Financial Modelling; Alaali Cost of Capital Model (ACCM).

1.0 INTRODUCTION

1.1 Research Context

The cost of capital occupies a central position in corporate finance because it connects financing decisions with investment valuation and required returns. Firms use cost-of-capital estimates in capital budgeting, discounted cash-flow valuation, acquisition analysis, financing decisions, and the evaluation of strategic investments. At its broadest level, the corporate cost of capital represents the return required by providers of debt and equity capital given the risks associated with supplying funds to the firm (Fama & French, 1999).

Modern cost-of-capital estimation has developed from foundational capital-structure and asset-pricing theory. Modigliani and Miller (1958) established the theoretical relationship between financing structure and firm value under restrictive market assumptions, while Sharpe (1964) and Lintner (1965) provided the foundations of CAPM and systematic risk pricing. WACC subsequently became a practical mechanism for combining the costs of debt and equity according to their proportional contribution to corporate financing. Questions concerning its definition, interpretation, and appropriate application nevertheless have persisted in the finance literature (Arditti, 1973; Nantell & Carlson, 1975).

1.2 Evolution of Cost-of-Capital Estimation

The development of corporate cost-of-capital estimation can be broadly represented as:

Capital Structure Theory → CAPM → WACC → Risk-Adjusted Cost-of-Capital Estimation

CAPM remains widely used for estimating the cost of equity because it provides a transparent relationship between systematic risk and expected return. However, its empirical limitations are also well established, particularly when a single beta is expected to summarize complex differences in required returns (Fama & French, 2004). Similarly, conventional WACC provides an important baseline estimate but depends heavily on how its underlying components are specified.

In practice, firms do not operate under identical financing environments. Country conditions, sovereign risk, changing market stress, leverage exposure, sustainability-related financing conditions and firm-specific volatility can affect the returns required by investors and creditors. Recent research on sovereign CDS spreads, for example, provides evidence that country risk can contain incremental information for expected equity returns and that additive country-risk term can be useful, particularly in developing markets (Bal, 2026).

1.3 Research Problem and Gap

The research gap addressed in this study does not arise from a claim that WACC or CAPM have never been modified. The literature already contains numerous approaches to adjusting expected returns and financing costs for different risk conditions. The narrower problem concerns

operational transparency: additional risks are often incorporated through different premiums, beta adjustments, spreads, analyst assumptions, or valuation conventions without a unified structure showing where the adjustment originates and how it modifies the conventional estimate.

Accordingly, there is scope for a transparent multi-factor specification that preserves WACC as the baseline while separately identifying additional contextual risk adjustments and minimizing duplication of risks already reflected in conventional inputs.

1.4 Research Question

RQ: How can conventional cost-of-capital estimation be extended through a transparent multi-factor structure that incorporates additional firm-specific and external risk conditions?

1.5 Research Objective

The objective of this study is to develop and illustrate the **Alaali Cost of Capital Model (ACCM)** as a transparent multi-factor approach to context-adjusted corporate cost-of-capital estimation.

1.6 Research Contribution

The study makes three specific contributions. First, it retains established WACC as the baseline rather than replacing conventional financial theory. Second, it introduces an explicit Contextual Risk Adjustment that separates firm-specific, incremental market, country, and ESG-related influences. Third, ACCM provides an interpretable decomposition of the difference between baseline WACC and context-adjusted cost of capital, allowing analysts to identify the source and direction of each additional adjustment.

2.0 LITERATURE REVIEW

2.1 Foundations of Cost-of-Capital Estimation

The theoretical foundations of cost-of-capital estimation are strongly connected to capital structure and asset pricing. Modigliani and Miller (1958) established a benchmark in which firm value is independent of financing structure under idealized assumptions. Subsequent developments recognized taxes, bankruptcy costs, information asymmetry, and financing frictions as important to real corporate financing decisions.

CAPM formalized the relationship between systematic risk and expected equity return (Sharpe, 1964; Lintner, 1965). Its conventional cost-of-equity form can be expressed as:

$$K_e = R_f + \beta(R_m - R_f)$$

Where **K_e** is the cost of equity, **R_f** is the risk-free rate, **β** measures systematic equity risk, and **$R_m - R_f$** represents the market risk premium.

WACC combines equity and debt financing costs:

$$WACC = [E / (D + E)]K_e + [D / (D + E)]K_d(1 - T)$$

Where E represents the market value of equity, D represents the market value of debt, K_d is the cost of debt, and T is the corporate tax rate.

Although conceptually straightforward, the interpretation of WACC depends on assumptions concerning financing weights, risk, project characteristics, and required returns (Arditti, 1973; Nantell & Carlson, 1975).

2.2 Capital Structure, Leverage, and Financing Cost

Capital structure influences the allocation of financial risk between debt and equity providers. Increasing leverage can initially provide financing and tax advantages but may eventually increase default exposure, creditor risk, equity volatility, and required returns. Dynamic capital-structure research demonstrates that financing decisions respond to changing firm conditions rather than remaining fixed over time (Hennessy & Whited, 2005).

The Alaali Optimal Leverage Model (ALOM) similarly treats leverage as a condition-dependent financial decision in which financing benefits must be assessed against distress exposure, earnings volatility, liquidity pressure, and external conditions (Alaali, 2025b). Within ACCM, this prior perspective supports treating leverage-related risk as a possible source of incremental firm-specific cost rather than assuming that observed capital structure alone fully represents financing risk.

2.3 Contextual Determinants of Cost of Capital

Cost-of-capital estimation can also depend on conditions outside the firm's conventional debt-equity structure. Sovereign and country risk can affect required returns, particularly when investors face political, institutional, currency, or macro-financial uncertainty. Recent evidence indicates that sovereign CDS spreads contain information relevant to international expected returns and that the effect is particularly evident in developing markets (Bal, 2026).

ESG-related conditions provide another potential financing channel. El Ghouli et al. (2011) found that stronger corporate social responsibility performance was associated with lower cost of equity for their sample, while Cheng et al. (2014) linked stronger CSR performance to improved access to finance. More recent evidence, however, suggests that ESG effects on WACC are heterogeneous and depend on firm characteristics rather than producing an identical financing benefit for every firm. Arouri et al. (2026), for example, report nonlinear and firm-dependent relationships between ESG performance and capital costs.

This heterogeneity is consistent with Country-Sensitive Financial Modelling Theory (CSFMT), which argues that financial-model applicability and interpretation can depend on the institutional and economic environment in which a model is applied (Alaali, 2026). Consequently, risk adjustments should not automatically be assumed to carry identical magnitude or direction across firms, sectors, and countries.

2.4 Research Gap and Positioning of ACCM

The presence of additional risk factors does not itself establish a new theory of the cost of capital. Country premiums, market adjustments, firm-specific premiums, and sustainability-related financing effects already exist in different parts of financial practice and academic research.

The contribution of ACCM therefore lies in **operational integration rather than claiming discovery of the underlying risk categories**. The model organizes conventional and contextual information through the structure:

Conventional Cost of Capital + Explicit Contextual Risk Adjustment

ACCM is consequently positioned as an operational cost-of-capital model rather than a replacement for CAPM, WACC, or existing asset-pricing theory.

3.0 METHODOLOGY AND ACCM SPECIFICATION

3.1 Model Development Approach

This study adopts a conceptual model-development approach supported by a hypothetical numerical illustration. The model is developed through the sequence:

Literature → Baseline Cost of Capital → Contextual Risk Identification → Adjustment Specification → ACCM Estimation → Illustrative Application

ACCM is positioned within the broader model-development architecture of the Alaali Financial Models Meta-Framework (AFMF), which emphasizes the development of financial models responsive to changing risk conditions while maintaining explicit model assumptions and defined analytical purposes (Alaali, 2025a). The present study does not undertake empirical calibration or validation.

3.2 Conventional WACC Baseline

ACCM begins with conventional WACC:

$$\text{WACC} = [E / (D + E)]K_e + [D / (D + E)]K_d(1 - T)$$

Cost of equity may be estimated through CAPM:

$$K_e = R_f + \beta(R_m - R_f)$$

The choice to preserve WACC as the starting point is deliberate. ACCM does not assume that established cost-of-capital approaches are invalid. Instead, it asks whether identifiable contextual conditions not adequately represented in the baseline inputs justify an explicit incremental adjustment.

Accordingly:

If no incremental contextual risk exists, ACCM converges to WACC.

3.3 ACCM Architecture

The general ACCM specification is:

$$\text{ACCM} = \text{WACC} + \text{CRA}$$

Where:

CRA = Contextual Risk Adjustment

The contextual adjustment is defined as:

$$\text{CRA} = \alpha\text{FR} + \beta_1\text{MR} + \gamma\text{CR} + \delta\text{ER}$$

Therefore:

$$\text{ACCM} = \text{WACC} + \alpha\text{FR} + \beta_1\text{MR} + \gamma\text{CR} + \delta\text{ER}$$

Where:

- **FR = Firm-Specific Risk**
- **MR = Incremental Market-Condition Risk**
- **CR = Country Risk**
- **ER = ESG-Related Risk**
- **α , β_1 , γ , and δ = adjustment coefficients**

The coefficients are not empirically estimated universal constants. At the present model-development stage, they represent calibration parameters that translate contextual risk inputs into percentage-point changes in the cost of capital.

3.4 Firm-Specific Risk Adjustment

The firm-specific risk component captures incremental financial risk not fully reflected in the baseline cost of debt, cost of equity, or financing weights. Potential inputs may include earnings volatility, unusually high leverage exposure, deteriorating debt-service capacity, liquidity pressure, or other identifiable firm-level conditions.

The adjustment is represented as:

$$\text{Firm-Specific Contribution} = \alpha\text{FR}$$

ALOM provides a related prior treatment of capital structure as a dynamic interaction between leverage benefits and risk exposure rather than a static debt-ratio optimization problem (Alaali, 2025b).

A key restriction is that FR should not mechanically reproduce risks already priced into **Kd**, beta, or other baseline inputs. Within ACCM, FR, MR, CR, and ER are specified as the baseline contextual risk domains because they represent distinct firm-level, market-level, country-level, and ESG-related sources through which incremental conditions may affect the cost of capital. These four domains are not intended to constitute an exhaustive taxonomy of contextual risk, and additional factors may be incorporated where they satisfy the model's eligibility requirements.

3.5 Market Risk Adjustment and Double-Counting Control

The market adjustment is represented as:

$$\text{Market Contribution} = \beta_1 \text{MR}$$

MR is specifically defined as **incremental market-condition risk not already captured by the CAPM beta, market risk premium, or other components used in the baseline cost-of-equity estimate**. This restriction is fundamental to ACCM because conventional CAPM already incorporates systematic market exposure. Adding a broad market-risk adjustment without establishing its incremental nature could double count risk and artificially increase the estimated cost of capital.

Accordingly:

If the identified market condition is already incorporated in β or $(R_m - R_f)$, $\text{MR} = 0$.

ACCM therefore applies an **anti-double-counting decision rule** before any market adjustment is introduced. A contextual risk factor is included in CRA only when it is identifiable, material to the firm, and not already represented in the baseline WACC inputs.

Risk Condition	Normally Reflected in Baseline WACC?	ACCM Treatment
General systematic market risk	Yes, primarily through β and market risk premium	No additional MR
Firm risk already incorporated in K_d or K_e	Yes	No additional adjustment
Country risk already incorporated in R_f , K_e , or K_d	Yes or partially	Add only the demonstrably incremental component
Extraordinary financing-market dislocation not reflected in baseline inputs	Not necessarily	Eligible for MR
Material contextual risk not captured elsewhere in WACC	Not necessarily	Eligible for CRA

Potential non-duplicative market conditions may include an extraordinary financing-market dislocation or temporary market condition not represented in the baseline estimation window. Fama

and French (2004) document broader limitations associated with a simple CAPM representation of expected returns, but ACCM does not treat such limitations as justification for automatically adding additional premiums. The burden is instead on the analyst to establish that the proposed adjustment represents incremental rather than duplicated risk.

3.6 Country Risk Adjustment

The country-risk component is:

$$\text{Country-Risk Contribution} = \gamma \text{CR}$$

CR captures incremental sovereign or country-specific conditions that are not already embedded in the selected risk-free rate, market premium, beta, or debt spread.

Potential inputs may include sovereign credit spreads, country-risk premiums, institutional instability, or other country-level financial conditions. Bal (2026) provides recent empirical support for the relevance of country-risk additions within CAPM-style expected-return estimation and finds that a simple additive country-risk term can perform at least as well as more complicated scaling approaches in the examined international sample.

The adjustment should therefore remain context-sensitive rather than universal, consistent with CSFMT (Alaali, 2026).

3.7 ESG-Related Risk Adjustment

The ESG-related component is:

$$\text{ESG Contribution} = \delta \text{ER}$$

ER captures financing effects associated with environmental, social, or governance conditions that are not already reflected in the conventional debt and equity costs.

Importantly, ER is not defined as inherently positive. Strong ESG conditions could reduce financing costs in some contexts, resulting in a negative adjustment, whereas material environmental, regulatory, governance, or transition exposure could increase required returns.

This treatment reflects empirical evidence that ESG and capital-cost relationships can vary across firms. Earlier research identified potential cost-of-equity and financing advantages associated with stronger CSR performance (El Ghouli et al., 2011; Cheng et al., 2014), while more recent evidence demonstrates substantial nonlinear and firm-specific variation (Arouri et al., 2026).

3.8 Contextual Risk Adjustment and Dimensional Consistency

For ACCM to remain mathematically coherent, the contextual adjustment must be expressed in units compatible with WACC. Since WACC is normally expressed as a percentage rate, each contextual contribution must ultimately represent a **percentage-point adjustment to the cost of capital**.

Thus:

α FR = percentage-point firm-specific adjustment

β_1 MR = percentage-point incremental market adjustment

γ CR = percentage-point country-risk adjustment

δ ER = percentage-point ESG-related adjustment

If FR, MR, CR, and ER are represented as standardized or unit less risk scores, the associated coefficients convert those scores into percentage-point capital-cost adjustments. This preserves dimensional consistency between the baseline WACC and CRA.

The coefficients are illustrative parameters in this study rather than empirically estimated coefficients or universal constants. Their eventual values should be calibrated using empirical evidence appropriate to the relevant firm, sector, country, and period. Similarly, the empirical measurement and normalization of FR, MR, CR, and ER constitute subsequent implementation and calibration tasks rather than claims established by the present conceptual model-development study. Accordingly, the present specification establishes the operational architecture of ACCM without claiming that a single measurement procedure or set of adjustment coefficients is universally applicable.

The four-factor specification represents the baseline ACCM architecture rather than an exhaustive list of every possible contextual risk. Where another risk factor is material, measurable, and demonstrably not already incorporated in the baseline WACC or another contextual adjustment, the generalized model can be expressed as:

$$\text{ACCM} = \text{WACC} + \Sigma(\theta_i R_i)$$

Where R_i represents an eligible incremental contextual risk factor and θ_i converts that factor into a percentage-point cost-of-capital adjustment. Under the current ACCM specification, the generalized form reduces to:

$$\text{ACCM} = \text{WACC} + \alpha\text{FR} + \beta_1\text{MR} + \gamma\text{CR} + \delta\text{ER}$$

This extensibility does not imply that additional factors should automatically be included. Any extension remains subject to the ACCM requirements of **materiality, measurability, dimensional consistency, and non-duplication**.

3.9 ACCM Interpretation

The difference between ACCM and conventional WACC is:

$$\text{ACCM} - \text{WACC} = \text{CRA}$$

Therefore:

CRA > 0 indicates that identified contextual conditions increase the estimated cost of capital.

CRA = 0 indicates that ACCM converges to conventional WACC.

CRA < 0 indicates that the net contextual conditions reduce the estimated cost of capital. ACCM should consequently be interpreted as a **context-adjusted estimate of the firm's cost of capital**, not as an objectively observed or universally correct cost of capital.

4.0 ILLUSTRATIVE APPLICATION

4.1 Purpose of the Illustration

A hypothetical numerical application is used to demonstrate the operational mechanics of ACCM without representing empirical evidence, calibration, or validation. The illustrative company does not correspond to a specific real-world firm, sector, or country. All values are hypothetical and are selected solely to show how conventional WACC interacts with the Contextual Risk Adjustment (CRA).

The illustration also provides a limited sensitivity assessment. Three contextual-risk scenarios are considered (low, baseline, and high) to demonstrate how changes in the assumed contextual conditions affect ACCM while the underlying conventional WACC remains unchanged. These scenarios are illustrative rather than empirically derived and should not be interpreted as calibrated risk ranges.

4.2 Hypothetical Baseline WACC

Assume the following financing structure:

Variable	Hypothetical Value
Market value of equity (E)	60
Market value of debt (D)	40
Cost of equity (Ke)	10.00%
Cost of debt (Kd)	6.00%
Corporate tax rate (T)	20.00%

The conventional WACC is:

$$\text{WACC} = (60 / 100)(10.00\%) + (40 / 100)(6.00\%)(1 - 0.20)$$

$$\text{WACC} = 6.00\% + 1.92\%$$

$$\text{WACC} = 7.92\%$$

The value of 7.92% constitutes the common baseline against which the contextual adjustments are assessed. Holding the baseline constant isolates the effect of changes in the CRA assumptions.

4.3 Baseline Contextual Risk Adjustment

For the baseline illustration, standardized contextual risk inputs and illustrative coefficients are assumed. The coefficients convert the respective risk inputs into percentage-point adjustments to the cost of capital.

Component	Risk Input	Adjustment Coefficient	Contribution
Firm-Specific Risk (FR)	0.50	0.50	+0.25 pp
Incremental Market Risk (MR)	0.20	0.50	+0.10 pp

Country Risk (CR)	0.80	0.50	+0.40 pp
ESG-Related Risk (ER)	-0.20	0.50	-0.10 pp

Accordingly:

$$\text{CRA} = 0.25 + 0.10 + 0.40 - 0.10$$

$$\text{CRA} = +0.65 \text{ percentage points}$$

The negative ESG-related contribution demonstrates that contextual adjustments need not operate in the same direction. In this hypothetical case, favorable ESG-related financing conditions partially offset the positive firm-specific, incremental market, and country-risk adjustments.

4.4 ACCM Calculation

The resulting baseline ACCM estimate is:

$$\text{ACCM} = \text{WACC} + \text{CRA}$$

$$\text{ACCM} = 7.92\% + 0.65\%$$

$$\text{ACCM} = 8.57\%$$

The difference between the conventional and context-adjusted estimates is therefore:

$$\text{ACCM} - \text{WACC} = +0.65 \text{ percentage points}$$

Measure	Estimate
Conventional WACC	7.92%
Contextual Risk Adjustment	+0.65 pp
ACCM	8.57%

The illustration does not demonstrate that 8.57% is a superior estimate of the firm's actual cost of capital. Rather, it demonstrates how ACCM makes explicit the assumptions and contextual contributions that generate the difference between the baseline and context-adjusted estimates.

4.5 Illustrative Sensitivity Analysis

To examine whether the ACCM estimate is mechanically dependent on a single set of contextual assumptions, two additional hypothetical scenarios are introduced while maintaining the same WACC and adjustment coefficients. The purpose is not to establish realistic risk distributions or calibrated boundaries but to demonstrate the directional sensitivity of ACCM to alternative contextual-risk conditions.

Scenario	FR	MR	CR	ER	CRA	ACCM
Low Contextual Risk	0.20	0.10	0.30	-0.30	+0.15 pp	8.07%
Baseline	0.50	0.20	0.80	-0.20	+0.65 pp	8.57%
High Contextual Risk	0.80	0.50	1.20	0.30	+1.40 pp	9.32%

Under the low-contextual-risk scenario:

$$\text{CRA} = 0.10 + 0.05 + 0.15 - 0.15$$

$$\text{CRA} = +0.15 \text{ percentage points}$$

Therefore:

$$\text{ACCM} = 7.92\% + 0.15\% = 8.07\%$$

Under the baseline scenario:

$$\text{CRA} = +0.65 \text{ percentage points}$$

$$\text{ACCM} = 7.92\% + 0.65\% = 8.57\%$$

Under the high-contextual-risk scenario:

$$\text{CRA} = 0.40 + 0.25 + 0.60 + 0.15$$

$$\text{CRA} = +1.40 \text{ percentage points}$$

Therefore:

$$\text{ACCM} = 7.92\% + 1.40\% = 9.32\%$$

The sensitivity illustration shows that ACCM remains close to conventional WACC when incremental contextual adjustments are limited and diverges progressively as the assumed net contextual risk burden increases. It also demonstrates that individual contextual components can operate in opposite directions, allowing favorable conditions to partially offset adverse risk adjustments.

The exercise demonstrates only the internal responsiveness of ACCM to alternative assumptions. It does not constitute empirical sensitivity analysis, robustness testing, coefficient calibration, or evidence that the hypothetical scenarios represent actual corporate risk distributions.

5.0 DISCUSSION

5.1 Interpretation of ACCM

The principal analytical contribution of ACCM is the separation of the baseline cost of capital from explicitly identified contextual adjustments. Conventional WACC remains visible rather than being replaced by a completely new discount-rate construct. The analyst can therefore observe not only the final estimate but also the source of its divergence from the baseline.

In the numerical illustration, WACC equals 7.92%, whereas ACCM equals 8.57%. The 0.65-percentage-point difference is attributable to identified contextual adjustments rather than an unexplained change in the discount rate. This structure makes the model auditable: a user can challenge the existence, direction, or magnitude of each adjustment independently.

5.2 ACCM and Conventional WACC

ACCM should be viewed as a contextual extension of conventional WACC rather than a substitute for it.

Feature	Conventional WACC	ACCM
Cost of equity	Yes	Yes
Cost of debt	Yes	Yes
Capital-structure weights	Yes	Yes
Firm-specific contextual adjustment	Usually implicit/varies	Explicit
Incremental market-condition adjustment	Usually implicit/varies	Explicit with anti-duplication rule
Country-risk adjustment	Depends on implementation	Explicit
ESG-related adjustment	Usually not explicit	Explicit
Final output	Baseline cost of capital	Context-adjusted cost of capital

This positioning is important because WACC itself has a substantial theoretical and practical foundation (Arditti, 1973; Nantell & Carlson, 1975; Fama & French, 1999). ACCM does not claim that conventional approaches are obsolete. Instead, it provides a structured mechanism for making additional assumptions visible.

5.3 Context Sensitivity

Two firms with identical conventional WACC estimates need not necessarily operate under identical risk environments. One firm may operate in a low-sovereign-risk environment with stable financing conditions, while another may face significant institutional or sovereign uncertainty. Similarly, ESG-related risk can affect financing differently depending on growth opportunities, sector exposure, regulatory conditions, and investor response.

Bal (2026) demonstrates that country risk can have incremental expected-return relevance, especially in developing markets, while Arouri et al. (2026) show that ESG effects on cost of capital can vary materially across firms.

This contextual heterogeneity is consistent with CSFMT, which emphasizes that financial-model interpretation and applicability can depend on the environment in which the model is applied (Alaali, 2026).

5.4 Practical Interpretation

ACCM can potentially support capital budgeting, corporate valuation, international investment analysis, acquisition assessment, financing decisions, and risk-adjusted hurdle-rate estimation. Its principal practical value lies in making the adjustment process explicit.

However, the model should supplement rather than replace professional judgment. Analysts remain responsible for establishing whether a proposed contextual factor is genuinely incremental, whether

its direction is economically defensible, and whether its calibration is supported by reliable evidence.

6.0 LIMITATIONS AND FUTURE RESEARCH

6.1 Limitations

ACCM remains a conceptual and operational model rather than an empirically validated cost-of-capital estimator. The coefficients α , β_1 , γ , and δ are not empirically estimated in this study, and the hypothetical numerical example does not establish external validity or predictive accuracy.

A further limitation concerns potential overlap between contextual adjustments and conventional WACC inputs. Firm risk may already be partially reflected in borrowing spreads, market risk may already be captured by beta and the market risk premium, and sovereign risk may influence several inputs simultaneously. ACCM therefore requires explicit anti-double-counting controls, but the effectiveness of these controls remains to be tested empirically.

The identification of genuinely incremental contextual risk also necessarily involves analytical judgment. Different analysts may reach different conclusions regarding whether a particular risk is already incorporated in baseline WACC inputs or qualifies for an additional contextual adjustment. Until operational measurement and calibration procedures are empirically established, this judgment may reduce comparability across applications and represents an additional source of model uncertainty.

The effect of ESG conditions is also unlikely to be homogeneous across firms, sectors, and countries, as demonstrated by contemporary evidence on nonlinear ESG–cost-of-capital relationships (Arouri et al., 2026).

Accordingly, this study does not claim that ACCM produces more accurate valuation outcomes than conventional WACC.

6.2 Future Research

Future research should empirically calibrate the contextual coefficients and develop appropriate measurement procedures for FR, MR, CR, and ER. Large corporate samples could be used to determine whether these contextual factors provide incremental information beyond the risks already incorporated in conventional WACC inputs. Particular attention should be given to distinguishing genuinely incremental risk from risk already reflected in the cost of equity, cost of debt, beta, market risk premium, or other baseline components.

Subsequent studies should examine sector-specific and country-specific calibration, coefficient stability across economic periods, and sensitivity to alternative definitions and measurements of contextual risk. Sensitivity analysis should also evaluate how alternative coefficient specifications affect both the magnitude of CRA and the resulting ACCM estimate. Where additional contextual factors are introduced through the generalized ACCM specification, their materiality, measurability, dimensional consistency, and non-duplication should be explicitly tested.

A particularly important validation objective is to identify and quantify potential double counting between baseline WACC inputs and contextual adjustments. Empirical research should also investigate whether interactions or nonlinear relationships exist among contextual risks before such effects are incorporated into expanded ACCM specifications. Direct comparisons between conventional WACC and empirically calibrated ACCM estimates in valuation and investment settings, followed by out-of-sample testing, could ultimately determine whether contextual adjustment provides useful incremental information and improves cost-of-capital estimation.

7.0 CONCLUSION

This study develops the **Alaali Cost of Capital Model (ACCM)** as a transparent multi-factor approach to context-adjusted corporate cost-of-capital estimation. Rather than replacing conventional WACC, ACCM preserves it as the baseline and introduces an explicit Contextual Risk Adjustment:

$$\text{ACCM} = \text{WACC} + \text{CRA}$$

Where:

$$\text{CRA} = \alpha \text{FR} + \beta_1 \text{MR} + \gamma \text{CR} + \delta \text{ER}$$

The model distinguishes four baseline contextual sources of incremental capital-cost adjustment: firm-specific risk, incremental market-condition risk, country risk, and ESG-related risk. Each contribution must ultimately be expressed as a percentage-point adjustment to maintain dimensional consistency with WACC.

The model also introduces an explicit double-counting restriction. Contextual risk should only be added when it is not already captured by conventional cost-of-equity, cost-of-debt, market-risk, or capital-structure inputs.

The hypothetical illustration demonstrates the operational mechanics of ACCM but does not constitute empirical validation. Accordingly, ACCM is positioned as a **conceptual and operational model for transparent context-adjusted cost-of-capital estimation**, not as a universally calibrated replacement for WACC or CAPM. Empirical calibration, contextual testing, and external validation remain necessary before claims concerning predictive or valuation superiority can be made.

By separating the conventional WACC baseline from explicitly identified contextual adjustments, ACCM is intended to make cost-of-capital adjustments more **transparent, traceable, and auditable**, allowing analysts and researchers to identify the source, magnitude, and rationale of each departure from the baseline estimate.

REFERENCES

1. Alaali, H. M. H. (2025a). *AFMF Volume I: Volatility, liquidity, and financial stability – Foundational version of DFAS*. SSRN. <https://doi.org/10.2139/ssrn.5368117>

2. Alaali, H. M. H. (2025b). *Alaali Optimal Leverage Model (ALOM): A strategic framework for capital structure optimization*. SSRN. <https://doi.org/10.2139/ssrn.5179472>
3. Alaali, H. M. H. (2026). *A theory of country-sensitive financial modelling (CSFMT): A conceptual foundation for institutional adaptation in comparative financial systems*. SSRN. <https://doi.org/10.2139/ssrn.7176839>
4. Arditti, F. D. (1973). The weighted average cost of capital: Some questions on its definition, interpretation, and use. *The Journal of Finance*, 28(4), 1001–1007. <https://doi.org/10.1111/j.1540-6261.1973.tb01422.x>
5. Arouri, H., Mrabet, Z., Temimi, A., & Smaoui, H. (2026). The differential effects of ESG performance on cost of capital: Growth opportunities and non-linear impacts. *Sustainable Futures*, 11, 101704. <https://doi.org/10.1016/j.sftr.2026.101704>
6. Bal, H. (2026). How should country risk enter the CAPM? Evidence from sovereign CDS and international equity returns. *Finance Research Letters*, 103, 110177. <https://doi.org/10.1016/j.frl.2026.110177>
7. Cheng, B., Ioannou, I., & Serafeim, G. (2014). Corporate social responsibility and access to finance. *Strategic Management Journal*, 35(1), 1–23. <https://doi.org/10.1002/smj.2131>
8. El Ghouli, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, 35(9), 2388–2406. <https://doi.org/10.1016/j.jbankfin.2011.02.007>
9. Fama, E. F., & French, K. R. (1999). The corporate cost of capital and the return on corporate investment. *The Journal of Finance*, 54(6), 1939–1967. <https://doi.org/10.1111/0022-1082.00178>
10. Fama, E. F., & French, K. R. (2004). The capital asset pricing model: Theory and evidence. *Journal of Economic Perspectives*, 18(3), 25–46. <https://doi.org/10.1257/0895330042162430>
11. Hennessy, C. A., & Whited, T. M. (2005). Debt dynamics. *The Journal of Finance*, 60(3), 1129–1165. <https://doi.org/10.1111/j.1540-6261.2005.00758.x>
12. Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics*, 47(1), 13–37. <https://doi.org/10.2307/1924119>
13. Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261–297.
14. Nantell, T. J., & Carlson, C. R. (1975). The cost of capital as a weighted average. *The Journal of Finance*, 30(5), 1343–1355. <https://doi.org/10.1111/j.1540-6261.1975.tb01060.x>
15. Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425–442. <https://doi.org/10.1111/j.1540-6261.1964.tb02865.x>
16. Alaali, H. M. H. (2025c). The DFAS-FEP Protocol: A Global Governance Standard for Responsible AI Use and Authorship Integrity in Financial Modelling. SSRN. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5260517

Appendix A – DFAS-FEP Authorship Classification and Compliance:

This manuscript complies with the **DFAS-FEP Protocol**, a structured authorship governance framework introduced by **the author (Alaali, 2025c)**

DFAS-FEP (Dynamic Financial Applied Meta-Science – Future Engine Prototype Protocol) provides an ethical protocol to ensure transparent and accountable authorship in AI-assisted financial research. It defines and enforces the distinction between fully human-generated content and AI-supported elements to uphold integrity, intellectual responsibility, and traceability across all components of this manuscript.

This classification directly supports the ethical architecture of the **DFAS-IFRS Code of Ethics**, which applies DFAS-FEP standards to financial disclosures influenced by artificial intelligence. For reference, see the published DFAS-FEP Protocol:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5260517

Appendix A.1 – (DFAS-FEP) Authorship Classification Table for This Manuscript

Manuscript Component	DFAS–FEP Class	Justification
Alaali Cost of Capital Model (ACCM) Core Architecture	Class 1	ACCM as a transparent multi-factor extension of conventional WACC was independently developed by the author.
Contextual Risk Adjustment (CRA)	Class 1	The architecture separating baseline WACC from explicit contextual risk adjustments was independently developed by the author.
Four Contextual Risk Domains	Class 1	The integration of Firm-Specific Risk, Incremental Market-Condition Risk, Country Risk, and ESG-Related Risk was structured by the author.
Firm-Specific Risk Adjustment	Class 1	The firm-specific adjustment and its eligibility restrictions were independently structured by the author.
Incremental Market-Condition Risk Adjustment	Class 1	The treatment of incremental market conditions separately from risks already captured by CAPM was independently developed by the author.
Country Risk Adjustment	Class 1	The explicit incorporation of incremental country and sovereign risk was independently structured by the author.
ESG-Related Risk Adjustment	Class 1	The bidirectional ESG-related financing-cost adjustment was independently developed by the author.
Anti-Double-Counting Architecture	Class 1	The decision rule excluding contextual risks already represented in baseline WACC inputs was independently developed by the author.
Dimensional Consistency Architecture	Class 1	The requirement that contextual contributions translate into percentage-point cost-of-capital adjustments was independently structured by the author.
Generalized ACCM Specification	Class 1	The extensible formulation $ACCM = WACC + \Sigma(\theta_i R_i)$ was independently developed by the author.

Context-Sensitive Calibration Principle	Class 1	The requirement for firm-, sector-, country-, and period-sensitive calibration was independently structured by the author.
Illustrative and Sensitivity Architecture	Class 1	The hypothetical application and low-, baseline-, and high-contextual-risk sensitivity structure were author-designed.
Narrative Structure and Analytical Exposition	Class 2	AI assistance was limited to linguistic refinement, clarity, and structural presentation.
Tables, Equations, and Model Presentation	Class 2	Substantive model content was author-designed; AI assistance was limited to presentation refinement.
Literature Review and Cross-Referencing	Class 2	Literature interpretation was author-directed; AI assistance was limited to citation alignment.
Appendices and Compliance Documentation	Class 2	AI assistance was limited to formatting and structural consistency.

Overall Manuscript Classification: Class 2 – AI-Assisted, Author-Validated

Core ACCM Model, CRA Architecture, Risk Adjustments, and Anti-Double-Counting Logic: Class 1 – Fully Human-Authored

Additional Clarifications

Human-Originated Content (Class 1): All substantive contributions—including **ACCM**, **CRA**, the four contextual risk domains, individual adjustment mechanisms, anti-double-counting architecture, dimensional consistency, generalized **ACCM** specification, contextual calibration principle, and sensitivity architecture were independently conceptualized and developed by the author.

AI-Assisted Content (Class 2): AI tools were used only for non-substantive linguistic refinement, formatting, presentation, and citation alignment.

Integrity Safeguards: All AI-assisted content was manually reviewed and validated under **DFAS-FEP v1.6**, with authorship classification and traceability documentation maintained.

Appendix B – Version History Log (VHL)

Version 1.0 – First Published on March 20, 2025. SSRN Repository:
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5179477

- The original manuscript introduced the **Alaali Cost of Capital Model (ACCM)** as a multi-factor approach integrating adjusted cost of equity, adjusted cost of debt, and a systemic-risk premium within corporate cost-of-capital estimation. It also presented an initial application using Alba and Alcoa.

• **Alaali-ACS: 0 | Classification: Class II – AI-Assisted, Author-Validated**

Version 2.0 – Revised August 28, 2026.

• The manuscript was substantially revised to formalize **conventional WACC as the explicit baseline**, the **Contextual Risk Adjustment (CRA)**, and four baseline contextual risk domains—**Firm-Specific Risk (FR)**, **Incremental Market-Condition Risk (MR)**, **Country Risk (CR)**, and **ESG-Related Risk (ER)**. The revision introduced an explicit **anti-double-counting architecture**, **dimensional-consistency requirements**, a **generalized ACCM specification**, context-sensitive calibration logic, and hypothetical sensitivity architecture. The original Alba–Alcoa application was replaced by a hypothetical numerical illustration, and the revised manuscript explicitly positions ACCM as a **conceptual and operational model** pending empirical calibration, external validation, and testing. The substantive model architecture and mathematical logic were fully human-authored. AI tools were used exclusively for non-substantive support functions, limited to layout adjustments, citation formatting, and controlled phrasing refinements, in full compliance with **DFAS-FEP v1.6** presentation standards.

• **Alaali-ACS: 0 | Classification: Class II – AI-Assisted, Author-Validated**