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Selecting Local Partners for Chinese Technology Firms Entering Saudi Arabia and the United Arab Emirates: An Explainable, Uncertainty-Aware Framework Using Public Data

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Abstract

Selecting an appropriate local partner is a critical yet underexplored stage of international market entry for technology firms, particularly when partner suitability depends on financial strength, technological complementarity, institutional access, governance quality, and reciprocal strategic value. This study develops an explainable and uncertainty-aware Value–Access–Integrity–Reciprocity (VAIR) framework for Chinese technology firms seeking local partners in Saudi Arabia and the United Arab Emirates. Eleven candidate firms were evaluated using publicly verifiable corporate data, with the evidence harmonized through a two-market comparability protocol and the candidate set screened using explicit non-compensatory audit and going-concern veto rules. Partner suitability was assessed under three Chinese entrant archetypes—AI/data infrastructure, cloud/cybersecurity, and state-linked digital infrastructure—using reciprocal-fit modelling and Stochastic Multicriteria Acceptability Analysis (SMAA) with 100,000 Monte Carlo iterations per primary scenario. In Saudi Arabia, ELM ranked first in all three base scenarios, with rank-one acceptability probabilities of 63.86%–72.75%, although 2P became the lead-

ing CN-AI candidate under acquisition-adjusted revenue-growth sensitivity. In the UAE, du led all hierarchical VAIR scenarios with rank-one probabilities of 51.46%–56.90%, while e& became the preferred candidate when the criterion-level weights were sampled without the hierarchical VAIR constraint. A retrospective consistency check against five publicly documented Chinese–local technology relationships, including announcements and memoranda of understanding, showed that four corresponding local firms fell within the top three model positions. This offers only limited external plausibility, rather than predictive validation or evidence of completed alliance performance. The findings show that local partner selection is a conditional matching decision shaped by entrant type, evidence uncertainty, and preference architecture. The framework provides a transparent and reproducible approach to screening prospective partners in institutionally complex technology markets.

Keywords: local partner selection; Chinese technology firms; Saudi Arabia; United Arab Emirates; stochastic multicriteria acceptability analysis; strategic alliances

1. INTRODUCTION

The international expansion of technology firms increasingly takes place through relationships rather than through standalone market entry. Digital infrastructure, cloud computing, artificial intelligence, cybersecurity, data services, and enterprise technologies are seldom deployed independently of local regulatory systems, implementation networks, institutional customers, and complementary technological capabilities. As a result, entering an attractive foreign market does not necessarily mean that a firm has resolved the more immediate strategic problem of how to establish an effective local position once it enters. In many technology-intensive markets, solving this second strategic problem depends heavily on selecting a suitable and credible local partner. An unsuitable partner may offer market visibility yet contribute little to implementation, institutional access, or technological integration; conversely, a technically capable company may lack the relationships, legitimacy, or organizational commitment required to support a foreign entrant over the longer term.

This issue is especially relevant to the internationalization of Chinese technology firms and other internationally expanding Chinese enterprises. A substantial body of research has shown that the overseas expansion of Chinese enterprises cannot be explained solely by the traditional assumption that firms internationalize to exploit advantages already developed at home. Chinese firms have also expanded abroad to acquire strategic resources, compensate for competitive disadvantages, gain technological and market capabilities, and respond to institutional conditions at home and abroad [1–4]. Their subsequent international expansion is also shaped by accumulated geographic and relational experience across markets, suggesting that foreign growth develops through networks and prior international commitments rather than through a sequence of independent location decisions [5]. At the same time, the international activities of Chinese technology firms have become increasingly embedded in broader digital ecosystems. Contemporary technology cooperation extends beyond the export of individual products to telecommunications networks, cloud and data infrastructure, artificial intelligence, digital platforms, satellite systems, and other interconnected technological services [6, 7]. These developments make the organizational quality and strategic fit of local partners increasingly consequential.

Within the Gulf Cooperation Council (GCC), Saudi Arabia and the United Arab Emirates provide an especially important context for this problem. Saudi Arabia and the United Arab Emirates have positioned digital transformation, advanced technologies, artificial intelligence, cloud infrastructure, cybersecurity, and technology-enabled public services as important priorities within their national economic transformation agendas. For Chinese technology firms, these markets therefore offer opportunities that extend well beyond conventional product sales. They also involve complex institutional environments in which public-sector organizations, regulated industries, large national enterprises, telecommunications operators, and technology integrators occupy important positions in the diffusion and implementation of technology. Under such conditions, market attractiveness alone offers limited guidance. Even after a firm has decided to enter one of these two markets, it must still determine which local organization can most effectively translate its technological resources into commercially and institutionally viable operations.

The strategic-alliance literature indicates that this decision should not be reduced to a simple comparison of firm size, profitability, or market share. Partner attractiveness is inherently relational. The value of a prospective partner depends on what resources are required by the focal firm, what institutional constraints surround the alliance, and what the intended collaboration is expected to accomplish. Institutional conditions have been shown to influence the attributes firms seek in alliance partners [8], while resource- and institution-based studies indicate that foreign entrants can use local relationships to obtain capabilities and access that would otherwise be costly or difficult to develop internally [9]. The importance of particular partner attributes also varies with alliance context [10], and local network positions may themselves become strategically valuable when they help foreign firms navigate institutional environments [11]. Thus, the question is not simply whether a local company is strong, but whether its particular combination of resources, institutional embeddedness, implementation capability, and organizational reliability is compatible with the needs of a specific foreign entrant.

A further complication is that strategic compatibility is reciprocal rather than unilateral. A local company may appear highly attractive to a Chinese entrant while having relatively little reason to commit to the relationship itself. Sustainable alliance formation requires the prospect of meaningful value creation for both sides. Research using two-sided matching logic has demonstrated that partner selection depends on complementarities between the attributes of both organizations rather than on a one-directional assessment of one firm's attractiveness [12]. This issue is particularly important in the technology sector because Chinese entrants themselves differ substantially. The local resources required by an AI and data-infrastructure firm may differ from those required by a cloud and cybersecurity provider or by a large state-linked digital-infrastructure enterprise. A local partner should therefore not be expected to have the same strategic value across all forms of Chinese technology entry.

Uncertainty in the decision environment makes this partner-selection problem still more difficult. Information about potential partners is rarely equally precise across all relevant dimensions, and decision makers cannot normally justify one indisputable set of importance weights for financial, technological, institutional, governance, and relational considerations. A deterministic scoring model can obscure these limitations by converting uncertain information and debatable preferences

into a single ranking that appears more precise than the evidence warrants. Stochastic Multicriteria Acceptability Analysis was developed for decision settings in which criterion measurements, preference information, or both are incomplete or uncertain [13, 14]. Its relevance to partner selection lies in its capacity to shift attention from the question of which firm receives the highest score under one imposed weighting scheme to the more informative question of how robustly each candidate performs across plausible preference structures and uncertain information.

Despite the relevance of these streams of research, four closely related research gaps remain. First, a level-of-analysis gap persists between the extensive literature on Chinese outward investment—particularly its motives, locations, entry processes, and institutional determinants—and the more specific *ex ante* decision of selecting one local technology partner among competing candidates within an already targeted foreign market [1–5]. Second, an operationalization gap remains between alliance theory and managerial decision practice. Existing research identifies complementarity, institutional embeddedness, network position, alliance capability, and organizational quality as important determinants of partner choice [8–11], but these insights have not been sufficiently integrated into a transparent and reproducible framework for comparing identifiable candidate firms before an alliance has been formed. Third, a reciprocity gap remains because local partner assessment is often approached from the perspective of what the partner can provide to the foreign entrant, whereas alliance formation requires mutual strategic value; the implications of two-sided matching [12] have not been adequately incorporated into technology-partner selection in two major GCC markets—Saudi Arabia and the United Arab Emirates. Fourth, an uncertainty gap remains between the inherent ambiguity of partner-selection decisions and the widespread managerial tendency to rely on fixed-weight scores or deterministic rankings. Although robust methods for multicriteria decision making under uncertainty are well established [13, 14], their potential has not been fully connected to the institutional and strategic problem of local partner choice by Chinese technology firms.

These gaps lead to the central research question of this study:

How can Chinese technology firms identify and compare suitable local partners in Saudi Arabia and the United Arab Emirates when partner attractiveness is multidimensional, reciprocal, and subject to incomplete information and uncertain managerial preferences?

To address this question, the study develops an explainable and uncertainty-aware Value–Access–Integrity–Reciprocity (VAIR) framework for local partner selection and examines its application to Chinese technology entry into Saudi Arabia and the United Arab Emirates. The framework is designed around a simple strategic premise: an effective local partner must contribute more than economic scale. It should offer relevant technological and commercial value, facilitate access to the institutional environment in which entry occurs, satisfy minimum standards of organizational integrity and viability, and create a relationship in which strategic benefits flow in both directions. Rather than treating these dimensions as a deterministic checklist, the framework explicitly recognizes uncertainty in both evidence and managerial preferences.

The contribution of the present study is therefore not merely the production of another fixed ranking of prospective local partner firms. Its broader purpose is to move partner-selection research toward a decision architecture that is theoretically grounded, transparent in its assumptions, sensitive to reciprocal strategic fit, and capable of distinguishing a stable recommendation from one that depends strongly on particular preferences or uncertain evidence. In doing so, the study connects research on Chinese internationalization with alliance partner selection and uncertainty-aware multicriteria decision making, while addressing a practical decision increasingly faced by technology firms seeking a durable position in the rapidly transforming technology markets of Saudi Arabia and the United Arab Emirates.

Beyond the immediate partner-selection problem, this decision architecture is relevant to the social and institutional dimensions of science and technology because local partner choice affects how digital capabilities are localized, governed, and diffused within regional innovation systems. In the Gulf context, this links firm-level alliance decisions to wider processes of technology-enabled development and institutional adaptation [15–20].

2. LITERATURE REVIEW AND THEORETICAL POSITIONING

The contemporary literature on Chinese internationalization has developed primarily around three interrelated questions: why Chinese firms invest abroad, where they invest, and how their distinctive institutional origins affect the internationalization process. Child and Rodrigues argued early in this literature that prominent Chinese firms often internationalized to address competitive disadvantages and obtain technological or brand assets rather than merely exploit pre-existing ownership advantages [1]. Buckley et al. subsequently demonstrated that conventional determinants of FDI need to be complemented by explanations reflecting Chinese institutional conditions and ownership advantages [2]. Luo and Tung's springboard perspective generalized this logic to emerging-market multinationals, for which foreign expansion may constitute a mechanism for capability acquisition and institutional escape [3]. Deng's critical review later showed that research had developed into identifiable streams concerning the antecedents, processes, and outcomes of Chinese firms' internationalization while still leaving important questions insufficiently integrated [4].

These perspectives explain why a Chinese firm may seek an overseas position, but they do not by themselves determine which local organization should become its partner once a destination has been selected. That decision occurs at a more

granular, firm-specific level. It concerns the relative contribution of candidate firms to the entrant's technology, implementation, institutional access, credibility, and longer-term strategic objectives. Evidence that Chinese multinationals follow geographic and investment-network pathways in subsequent outward expansion further suggests that local embeddedness and relational infrastructure deserve attention alongside conventional location factors [5].

Alliance research treats complementarity as a relational property. A firm's resources become strategically attractive when they address a specific requirement of the prospective partner or the planned alliance. Institutional context further changes what is scarce and therefore valuable. Hitt et al. showed that different institutional environments alter the attributes emphasized in alliance partner selection [8], while Meyer et al. demonstrated more generally that institutions and resources jointly shape the strategies used by foreign investors in emerging economies [9]. At the firm level, network positions can themselves become partner-selection assets where they help a foreign entrant navigate local institutional conditions [11].

The implication is that local partner quality cannot be treated as an invariant latent characteristic. It is contingent on the task, the institutional setting, and the strategic requirements of both organizations. Shah and Swaminathan's contingency model is particularly important in this respect because it rejects the assumption that the same selection criteria should carry identical importance across alliance projects [10]. Mindruta et al. take the argument further by modelling partner selection as a two-sided matching process in which the complementarities of heterogeneous firms determine mutual attractiveness [12]. However, an important translation problem remains between this explanatory literature and the decision problem faced by managers before an alliance is formed. Empirical matching studies typically infer preferences and complementarities from observed alliance formation across a market or sample of realized relationships. Such designs are powerful for explaining how partners sort, but they provide less direct guidance for the ex ante comparison of identifiable candidate firms when the eventual relationship, its outcomes, and even some relevant information remain uncertain. Together, these studies therefore establish the theoretical importance of technology complementarity, institutional bridging, alliance capability, and reciprocal fit, while leaving scope for a managerially operational pre-alliance assessment framework.

The need for such adaptation becomes more pronounced in Saudi Arabia and the United Arab Emirates. The institutional setting of the Gulf combines market development with forms of state capitalism in which government-business relations, public investment, and state-linked enterprises play substantial roles in economic diversification [15]. In the digital sphere specifically, recent research on Saudi Arabia and the UAE shows that technology development is closely intertwined with state-led growth strategies, regulatory institution-building, data governance, cybersecurity, and other public-policy objectives [16]. Institutional access in these markets therefore cannot be treated merely as an external environmental condition; it can constitute part of the strategic value that a local partner brings to the relationship. Partner-selection frameworks developed in other institutional settings may consequently require contextual adjustment rather than direct transplantation.

Recent work on China-Gulf digital relations makes this contextual adaptation more specific. Studies of the Digital Silk Road and Sino-Arab AI diplomacy show that China's technological engagement with the Middle East increasingly combines digital infrastructure, artificial intelligence, data governance, and broader strategic and economic diplomacy [17, 18]. Research focused more directly on Saudi Arabia and the UAE further shows that these states actively navigate competing Chinese and Western technology ecosystems, while comparative evidence across the six GCC countries emphasizes local agency, digital sovereignty, and substantial institutional variation in the reception and adaptation of Chinese AI and digital infrastructure [19, 20]. Taken together, this literature suggests that Chinese technology entry is mediated by host-country institutions and local strategic priorities rather than by technology supply alone, strengthening the case for treating institutional bridging and local embeddedness as components of partner value.

The VAIR framework developed in this study responds to these theoretical and contextual limitations by translating relational partner-selection logic into an ex-ante assessment architecture adapted to the institutional characteristics of the two focal markets. It also introduces two additional disciplines. First, potential deal-breaking concerns are not allowed to disappear inside a weighted average. Critical integrity or viability failures are evaluated through a separate veto mechanism before compensatory ranking. Second, uncertainty in both evidence and preferences is carried into the decision analysis rather than resolved by analyst-imposed precision. This is precisely where SMAA becomes methodologically appropriate: the method was explicitly designed to analyse alternatives when criterion values or importance weights are inaccurate, incomplete, or uncertain, and to express results as rank acceptability rather than as one deterministic ordering [13, 14].

The resulting theoretical position is therefore neither a conventional FDI location model nor a standard alliance-selection scorecard. It treats local partner selection as a conditional matching problem under institutional and preference uncertainty. The attractiveness of a candidate therefore depends not only on the resources it brings, but also on the institutional interfaces it can bridge in the focal host market, the risks that cannot reasonably be compensated by strengths elsewhere, and the value each side can create for the other. The next section operationalizes these ideas through the harmonized public-data protocol, the VAIR measures, the entrant scenarios, the veto rules, and the stochastic ranking procedure.

3. METHODOLOGY

3.1. RESEARCH DESIGN AND UNIT OF ANALYSIS

This study employs a comparative, firm-level decision-analytic design to evaluate prospective local partners for Chinese technology firms entering Saudi Arabia and the United Arab Emirates. The analysis is *ex ante* rather than outcome-based: the purpose is not to explain the performance of alliances that have already been formed, but to assess the relative suitability of observable candidate firms before a partnership decision is made. Accordingly, the unit of analysis is the candidate local partner, not the host country, investment project, or completed alliance.

The operational candidate universe was defined as locally established firms in the two focal markets whose publicly documented activities indicated a plausible role in the implementation, integration, localization, institutional deployment, or scaling of digital technologies for a foreign technology entrant. Candidate identification therefore followed functional relevance rather than a narrow industry-code definition. Firms were screened out when their principal activities were not sufficiently aligned with this partner role or when critical public information required for the financial and governance assessment was entirely unavailable or could not be independently verified.

Publicly verifiable information also had to be sufficient to evaluate the core financial, governance, technological, institutional, and relational dimensions of the framework. The study therefore used purposive sampling rather than probability sampling. The resulting candidate pool is not intended to constitute a statistically representative sample of all technology firms in either country; rather, it provides a bounded set of decision-relevant alternatives through which the *ex-ante* partner-selection framework can be applied and evaluated. The final sample comprised six firms in Saudi Arabia and five in the United Arab Emirates, yielding eleven prospective local partners. Their functional relevance and country distribution are presented in Table 1.

Accordingly, the eleven-firm set should be interpreted as a bounded, decision-relevant candidate universe rather than as an exhaustive census of all technology-capable firms in either market. Accordingly, the analysis does not seek to make statistical inferences from this purposive sample to a broader population of firms.

Table 1. *Candidate firms included in the empirical analysis*

Country	Candidate firm	Principal functional relevance
Saudi Arabia	solutions by stc	ICT, digital transformation and managed technology services
Saudi Arabia	Elm	Digital platforms and technology-enabled public services
Saudi Arabia	MIS	ICT, systems integration, cloud, data and cybersecurity
Saudi Arabia	Arab Sea Information Systems	Software, cloud and enterprise technology services
Saudi Arabia	2P	ICT, software and managed digital services
Saudi Arabia	AZM	Enterprise technology, platforms and digital solutions
United Arab Emirates	Alpha Data	Systems integration and digital transformation
United Arab Emirates	Presight	AI, data analytics and digital platforms
United Arab Emirates	Space42	AI-enabled space technology, geospatial and digital infrastructure
United Arab Emirates	e&	Telecommunications, digital technology and regional infrastructure
United Arab Emirates	du	Telecommunications, enterprise digital services and connectivity

The primary models were estimated separately for Saudi Arabia and the United Arab Emirates. This choice was made before ranking because combining firms from the two markets without first resolving differences in currency, market scale, fiscal timing, disclosure practice, and institutional context could confound country effects with partner quality. A pooled Saudi–UAE analysis was therefore retained only as a secondary sensitivity exercise and was not used for statistical generalization beyond the two focal markets.

3.2. DATA ARCHITECTURE, SOURCE HIERARCHY AND INFORMATION CUT-OFF

The empirical database was constructed exclusively from publicly traceable corporate evidence available by 30 June 2026. For each candidate, the latest audited financial year ending before the cut-off was used. The principal observation year was FY2025, although exact fiscal year-end dates were retained where companies did not follow a calendar-year financial reporting cycle.

A fixed source hierarchy was used throughout the extraction process. Signed audited financial statements and the independent auditor's report had priority for accounting and audit variables, followed by stock-exchange or regulatory disclosures, annual or integrated reports, corporate-governance reports, and finally official investor-relations or corporate supplementary disclosures. Where two official documents reported conflicting values, the higher-ranked or more specialized source governed the primary measurement, while the competing value and resolution rule were retained in the audit log.

No mean-based, median-based, model-based, or discretionary numerical imputation was permitted under the specified

data-processing protocol. Missing quantitative information triggered a comparability review rather than automatic replacement. For qualitative evidence, non-disclosure was deliberately distinguished from verified absence. This distinction was important because firms differ substantially in disclosure intensity; assigning zero whenever evidence was not found would systematically reward firms that publish more extensive reports rather than firms that possess stronger underlying capabilities.

This public-evidence requirement also formed part of the candidate-eligibility assessment: a firm could be functionally relevant but still remain outside the final decision set if the minimum financial or governance evidence necessary for a comparable assessment was wholly unavailable. This rule ensured that inclusion reflected both strategic relevance and evaluability under a common and consistently applied evidence standard.

Before the UAE firms were coded, a cross-country measurement protocol was internally frozen. This was an audit lock rather than a public preregistration, but subsequent changes required an explicit change-control record. The protocol specified the information cut-off, source hierarchy, coverage rules, missing-data treatment, veto conditions, transformations, normalization procedure, weight model and Monte Carlo settings before the final rankings were observed.

3.3. HARMONIZATION GATE

Each candidate criterion was subjected to a two-market Harmonization Gate before being admitted to the primary decision model. Four properties were systematically examined: data coverage, definitional equivalence, temporal comparability, and the equivalence of the underlying source and disclosure scope. Numeric criteria were retained in the base country model only when comparable coverage reached at least 80% within each relevant country. Evidence-based constructs additionally required at least 60% of their sub-indicators to contain direct or partial verified evidence for a firm and at least 80% usable construct coverage at the country level.

The gate retained eight compensatory measures: V1, V2, V3, V4, A2, I2, R1 and R2. Ownership concentration was not included in the common two-market specification because the scope of major-shareholder disclosure was not sufficiently consistent across the Saudi firms. National localization ratios were also excluded from the pooled model because Saudization and Emiratization arise from distinct national policy and measurement regimes and were not assumed to be equivalent constructs merely because both were expressed as percentages. Local operating tenure was retained as contextual information but excluded from the base model because legal incorporation, operating origin, predecessor history and post-merger entity formation could not be harmonized without adding analyst-imposed assumptions.

3.4. OPERATIONALIZATION OF THE VAIR FRAMEWORK

The retained criteria were organized under four dimensions: Value, Access, Integrity and Reciprocity. The Value dimension contained four separately operationalized components. V1 represented firm scale and was measured as the natural logarithm of audited FY2025 revenue. V2 captured audited revenue growth relative to FY2024. V3 measured operating profitability as operating profit divided by revenue. Where an audited statement did not explicitly present an operating-profit subtotal, a pre-specified finance-adjusted pre-tax-profit bridge was used only after validation against UAE firms for which both the direct operating-profit value and the proxy could be calculated. V4 measured technology complementarity with the entrant profile.

Access was represented by A2, the candidate firm's institutional bridging capability. Integrity was represented in the compensatory model by I2, the proportion of independent directors on the active year-end board, while audit opinion and going-concern uncertainty were treated separately as non-compensatory eligibility conditions. Reciprocity contained R1, documented alliance capability, and R2, reciprocal strategic fit for the particular entrant archetype.

V4, A2 and R1 were operationalized through pre-specified five-item evidence rubrics applied to publicly verifiable documentary evidence. V4 assessed entrant-relevant core technology capability; systems integration and managed-service capability; regulated or critical-sector technology delivery; relevant technology-vendor ecosystems; and localization or customization capability. A2 captured verified public or regulated-sector delivery; national-scale or strategic infrastructure roles; long-term institutional relationships; regulatory or compliance implementation capability; and the breadth and recurrence of institutional embeddedness. R1 assessed strategic technology alliances; long-term alliance governance; co-development capability; multi-partner ecosystem coordination; and cross-border alliance or expansion capability. Because V4, A2 and R1 required researcher interpretation of documentary evidence, inter-coder reliability was assessed on a blinded subsample of the documentary coding records rather than relying solely on the judgments of an individual coder. Each documentary sub-indicator was coded using the same pre-specified evidence-classification rules:

Direct verified evidence = 1.0

Partial or indirect verified evidence = 0.5

Explicit incompatibility or verified absence = 0

No verified evidence = uncertain interval [0, 0.5]

To assess the consistency of documentary coding, a secondary re-coding audit was conducted on a stratified 40% subsample of the V4, A2 and R1 coding records (110 of 275 records). Two sub-items were randomly selected from each five-item firm–construct block using a fixed random seed (20260822), ensuring representation of both countries, all candidate firms, and all three constructs. Agreement between the primary and secondary coding passes was evaluated using nominal Krippendorff's alpha. Krippendorff's alpha was selected because it provides a general reliability coefficient applicable across different measurement levels and coding structures [21]. The nominal form was appropriate here because the rubric included the distinct category U (“no verified evidence”), for which imposing an ordinal distance relative to partial or direct evidence would have been arbitrary. Exact agreement was 96.4%, and the resulting coefficient was $\alpha = 0.840$. The four disagreements were confined to alliance-governance and co-development items within R1 and were retained in the audit trail.

The reported denominator of 275 individual coding records reflects 11 candidates multiplied by 25 rubric decisions per candidate: 15 V4 sub-indicator decisions across the three entrant archetypes, five A2 sub-indicators, and five R1 sub-indicators. The 110-record audit therefore corresponds exactly to 40% of this coding universe.

Each evidence-based construct score was calculated as the simple arithmetic mean of its five pre-specified sub-indicators. Equal-weight aggregation was retained deliberately because introducing additional expert-derived weights within the qualitative constructs would have added a further preference layer before the SMAA procedure. The reliability assessment addressed consistency in documentary coding, whereas uncertainty in criterion importance was handled separately within the stochastic weighting stage.

3.5. CHINESE ENTRANT SCENARIOS AND RECIPROCAL STRATEGIC FIT

Because the suitability of a local partner depends on the type and strategic requirements of the foreign entrant, three Chinese technology archetypes were specified before scoring: CN-AI, representing a private AI/data-infrastructure provider; CN-CLOUD, representing an enterprise cloud, cybersecurity and software vendor; and CN-SOE, representing a large state-linked digital-infrastructure integrator. The scenarios were deliberately defined as archetypes rather than named Chinese companies so that the analysis could remain executable using public evidence without relying on confidential firm-specific strategy.

R2 follows the two-sided matching logic of alliance formation [12] by evaluating both the value that the local partner can provide to the entrant and the value that the entrant could create for the local partner. Because no defensible empirical basis was available for assigning systematically greater bargaining weight to either side across the three entrant archetypes, the base model adopted a symmetric specification. The 50:50 weighting should therefore be interpreted as a neutral modelling baseline rather than an empirical estimate of bargaining power. This specification preserves the two-sided character of partner selection and avoids privileging the foreign entrant's perspective *ex ante*.

$$P2E_{i,s} = \frac{1}{4} \sum_{k=1}^4 p_{k,i,s} \quad \text{and} \quad E2P_{i,s} = \frac{1}{4} \sum_{k=1}^4 e_{k,i,s}.$$

$$R2_{i,s} = 0.5 P2E_{i,s} + 0.5 E2P_{i,s}, \quad (1)$$

where i denotes the candidate local partner and s denotes the Chinese entrant scenario. $P2E_{i,s}$ represents partner-to-entrant value and is calculated as the mean of four components: local market and customer access, institutional and regulatory access, local delivery and managed-service capacity, and localization and compliance-adaptation capacity. $E2P_{i,s}$ represents entrant-to-partner value and is likewise calculated as the mean of four components: advanced-technology gap filling, access to Chinese or global technology ecosystems, scale/project/capital complementarity, and credible opportunities for new-product or market growth.

Within each direction, the four components receive equal weights of 0.25. As with the 0.50 weighting between the two directions, these equal weights are used as transparent baseline assumptions rather than as empirically estimated importance parameters. No sufficiently comparable empirical evidence was available to justify consistently privileging one component over another across all candidate firms and entrant scenarios. Equal weighting therefore avoids introducing an additional layer of analyst-imposed preference into the reciprocal-fit construct before the subsequent SMAA stage. At the directional level, the symmetric 0.50–0.50 specification gives equal analytical standing to partner-to-entrant and entrant-to-partner value, consistent with the two-sided matching logic underlying the construct [12]. This symmetry does not imply equal bargaining power in actual alliance negotiations; rather, it prevents the base model from structurally privileging the foreign entrant's perspective when no defensible evidence supports an asymmetric alternative.

Because the study had no empirical basis for a general asymmetric bargaining prior, the directional 0.50–0.50 specification was not re-estimated as if it were an observed parameter. This choice is treated explicitly as a modelling assumption, and the absence of an asymmetric-direction sensitivity test is acknowledged in the limitations.

3.6. NON-COMPENSATORY VETO RULES

Two critical integrity conditions were assessed before normalization and compensatory scoring were undertaken. An adverse audit opinion or a disclaimer of opinion constituted a hard veto, because either finding would compromise the minimum evidential basis required for inclusion. An explicit auditor statement of Material Uncertainty Related to Going Concern likewise resulted in exclusion from the base model. A qualified opinion triggered review rather than automatic exclusion.

The rationale for introducing this non-compensatory stage is methodological and structural. A severe viability or audit-integrity problem should not disappear because the same candidate performs strongly on technological or institutional criteria. Firms excluded by the going-concern rule were nevertheless restored in a pre-specified sensitivity analysis, allowing the effect of the non-compensatory decision to be examined rather than concealed.

3.7. NORMALIZATION, WEIGHT UNCERTAINTY AND SMAA

Following the application of the non-compensatory veto rules, $V1 - V3$ were normalized separately within each country's eligible candidate set using min-max normalization:

$$z_{ij} = \frac{(x_{ij} - \min_k x_{kj})}{(\max_k x_{kj} - \min_k x_{kj})}, \quad (2)$$

where x_{ij} is the raw value of firm i on criterion j , and z_{ij} is the corresponding normalized value. $I2$ and the evidence-rubric constructs already lay on a 0–1 scale and were therefore not rescaled. The Value and Reciprocity dimensions were then calculated as:

$$V_{i,s} = w_{V1}z_{i,V1} + w_{V2}z_{i,V2} + w_{V3}z_{i,V3} + w_{V4}V4_{i,s}, \quad (3)$$

$$R_{i,s} = w_{R1}R1_i + w_{R2}R2_{i,s}, \quad (4)$$

and total utility as:

$$U_{i,s} = W_V V_{i,s} + W_A A2_i + W_I I2_i + W_R R_{i,s}. \quad (5)$$

No expert panel was asked to produce, or was assumed to have agreed upon, a fixed set of criterion-importance weights. Instead, SMAA explored the admissible preference space, consistent with the method's original purpose of analyzing multicriteria problems with uncertain measurements and incomplete or unavailable preference information [13, 14, 22, 23]. The original SMAA formulation introduced systematic weight-space exploration, acceptability indices, central weights and confidence factors [22], while SMAA-2 extended the analysis to all possible ranks [23]. Monte Carlo implementation is well established for evaluating the multidimensional integrals required by the method [14]. The four top-level VAIR weights were sampled as:

$$(W_V, W_A, W_I, W_R) \sim \text{Dirichlet}(1, 1, 1, 1)$$

Within Value:

$$(w_{V1}, w_{V2}, w_{V3}, w_{V4}) \sim \text{Dirichlet}(1, 1, 1, 1),$$

and within Reciprocity:

$$(w_{R1}, w_{R2}) \sim \text{Dirichlet}(1, 1).$$

This hierarchical structure prevents dimensions containing more sub-criteria from receiving greater expected influence merely because they contain more variables.

Uncertainty in the underlying criterion measurements was explicitly propagated within the Monte Carlo simulation. Unverified qualitative evidence was sampled uniformly over $[0, 0.5]$. The unresolved official classifications of board independence for MIS were represented by an interval rather than an imputed point value. For Alpha Data and Presight, where audited statements did not disclose an explicit operating-profit subtotal, the validated finance-adjusted proxy was sampled within a symmetric raw-margin interval of ± 0.36 percentage points, reflecting the rounded maximum proxy error observed in the three UAE validation firms.

For iteration t , each alternative received a utility and corresponding ordinal rank. The rank acceptability index for firm i at rank r was estimated as:

$$b_i^r = \frac{1}{N} \sum_{t=1}^N \mathbf{1}(\text{rank}_i^{(t)} = r), \quad (6)$$

where $\mathbf{1}(\cdot)$ is an indicator function equal to one when the stated condition holds and zero otherwise. The analysis reports rank acceptability, expected rank, pairwise winning probabilities, central effective weights and confidence factors rather

than relying solely on one mean utility score. These outputs are consistent with the principal descriptive quantities developed in the SMAA literature [22, 23].

3.8. SIMULATION, ROBUSTNESS AND REPRODUCIBILITY

Each country–entrant scenario combination was evaluated using 100,000 Monte Carlo iterations with a fixed random seed of 20260815. Numerical convergence was assessed by directly comparing rank-one acceptability estimates after 50,000 and 100,000 iterations. A run was considered converged when the maximum absolute change in $P(\text{rank} = 1)$ across candidates did not exceed 0.005; otherwise the protocol required extension to 250,000 iterations.

The robustness analysis was specified before the final candidate rankings were interpreted. It included equal weighting, an unconstrained criterion-level Dirichlet model, rank-based rather than min-max normalization, M&A- or merger-adjusted revenue-growth scenarios where official evidence indicated material comparability effects, a wider uncertainty interval for the UAE operating-margin bridge, exclusion of the non-calendar-year Saudi firm, and re-entry of any firm removed by the MURGC veto. For uncertain qualitative evidence, pessimistic and optimistic endpoint checks were also retained where relevant.

The pooled GCC analysis was secondary rather than primary. Firm scale (V1) was omitted from this pooled sensitivity because cross-country revenue scale reflects both company characteristics and host-market structure. All calculations were implemented programmatically, with the full input matrix, coding rules, random seed, simulation outputs, source hashes and analysis code retained in a versioned research workbook and machine-readable files. This design allows the complete analysis to be rerun if additional data become available or if reviewers request alternative robustness specifications.

4. RESULTS

The cross-country harmonization procedure retained eight distinct compensatory variables for the country-specific decision models: V1–V4, A2, I2, R1 and R2. All retained quantitative criteria achieved usable coverage across the candidate sets after the specified uncertainty treatments. By contrast, ownership concentration, national localization ratios and operating tenure were not promoted to common GCC criteria because their definitions or disclosure scopes were insufficiently equivalent across the two countries. Firm scale was retained in the Saudi and UAE models but omitted from the secondary pooled-GCC analysis.

The final non-compensatory screening produced five eligible firms in each country. One Saudi candidate, Arab Sea Information Systems, was excluded from the base model because its auditor explicitly reported a material uncertainty related to going concern. Importantly, the firm was not removed permanently from the analytical record; it was reintroduced in the pre-specified sensitivity analysis to test whether the veto decision materially changed the rankings. None of the UAE candidates required a corresponding exclusion under the same hard-veto conditions.

The UAE harmonization process also resolved the heterogeneous presentation of operating profit. Three firms disclosed an explicit audited operating-profit subtotal, whereas Alpha Data and Presight did not. The finance-adjusted pre-tax-profit bridge was validated against the three directly observable cases, producing a mean absolute error of approximately 0.120 percentage points and a maximum absolute error of 0.354 percentage points. The two resulting proxy margins were consequently retained with a ± 0.36 percentage-point uncertainty interval and were not treated as exact observed operating-profit margins.

The 100,000-run country-specific SMAA results show a relatively concentrated ranking structure in Saudi Arabia and a more competitive pattern in the UAE. Table 2 reports the first-ranked candidate and the closest challenger in each entrant scenario.

For readability, Table 2 reports the leading candidate and closest challenger in each scenario; Figures 1 and 2 display the full rank-one acceptability distributions across all candidates, while the underlying simulation outputs are covered by the data-availability statement.

In Saudi Arabia, ELM achieved the highest rank-one acceptability in all three scenarios: 63.86% for CN-AI, 72.75% for CN-CLOUD and 72.65% for CN-SOE. 2P was the only candidate that consistently generated a substantial probability of first place, reaching 32.17%, 25.34% and 24.84%, respectively. The remaining candidates rarely occupied the first rank.

The distinction between the two leading Saudi candidates is particularly visible in the complete rank distributions. Under CN-AI, ELM was ranked first in 63.86% of iterations but second in a further 15.43%, whereas 2P was first in 32.17% and second in 42.13%. Thus, the analysis does not yield a deterministic separation between the two firms; rather, it identifies ELM as the more frequently acceptable first choice across the sampled preference space. Under CN-CLOUD and CN-SOE, the separation becomes clearer, with ELM's first-rank probability exceeding 72%.

The UAE rank-one acceptability results are less concentrated across the candidate firms. du remained the most frequently first-ranked firm in all three archetypes, but its $P(\text{rank} = 1)$ declined from 56.90% under CN-AI to 51.78% under CN-CLOUD and 51.46% under CN-SOE. Meanwhile, the identity of the strongest alternative changed with entrant type.

e& was the nearest competitor by expected rank under CN-AI, whereas Presight became increasingly competitive under CN-CLOUD and particularly CN-SOE, where it reached $P(\text{rank} = 1) = 21.34\%$ and an expected rank of 2.319.

These scenario-specific shifts are particularly important because they show that the framework does not simply reproduce one invariant corporate ranking. Space42, for example, obtained a relatively substantial first-rank probability of 18.18% in the CN-AI case but only 9.44% under CN-SOE; by contrast, Presight moved from 4.97% under CN-AI to 21.34% under CN-SOE. The ordering of prospective partners therefore responds to the strategic requirements of the entrant archetype rather than only to general firm strength.

Table 2. Primary SMAA results by Chinese entrant archetype

Market	Scenario	Candidate	$P(\text{rank} = 1)$	Expected rank
Saudi Arabia	CN-AI	ELM	0.6386	1.642
Saudi Arabia	CN-AI	2P	0.3217	2.065
Saudi Arabia	CN-CLOUD	ELM	0.7275	1.402
Saudi Arabia	CN-CLOUD	2P	0.2534	2.123
Saudi Arabia	CN-SOE	ELM	0.7265	1.420
Saudi Arabia	CN-SOE	2P	0.2484	2.150
United Arab Emirates	CN-AI	du	0.5690	1.798
United Arab Emirates	CN-AI	e&	0.1995	2.557
United Arab Emirates	CN-CLOUD	du	0.5178	1.940
United Arab Emirates	CN-CLOUD	Presight	0.1354	2.539
United Arab Emirates	CN-SOE	du	0.5146	1.967
United Arab Emirates	CN-SOE	Presight	0.2134	2.319

Note: Lower expected rank indicates a more favorable average position. Probabilities are based on 100,000 Monte Carlo iterations.

The complete rank-one distributions are presented graphically in Figures 1 and 2.

Pairwise winning probabilities provide a more direct and interpretable assessment of the principal competitive relationships. In Saudi Arabia, ELM defeated 2P in 64.65% of CN-AI iterations and in 73.11% of both CN-CLOUD and CN-SOE iterations. These probabilities reinforce the first-rank results while also showing that ELM's advantage is appreciably narrower in the AI-oriented scenario.

In the UAE, du exceeded e& in 69.43% of pairwise simulations in each of the three scenarios. Against Presight, du's winning probability declined from 79.83% under CN-AI to 70.13% under CN-CLOUD and 67.61% under CN-SOE. This movement is consistent with Presight's improved overall ranking in the SOE scenario and indicates that the latter scenario produces the most competitive UAE decision space.

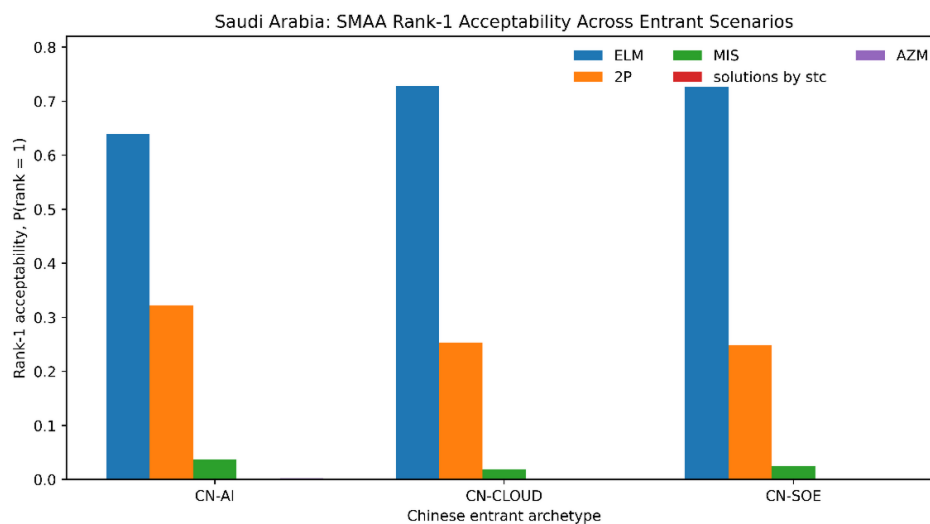


Figure 1. SMAA rank-one acceptability across Chinese entrant scenarios: Saudi Arabia (Authors' calculations based on the harmonized public-data dataset).

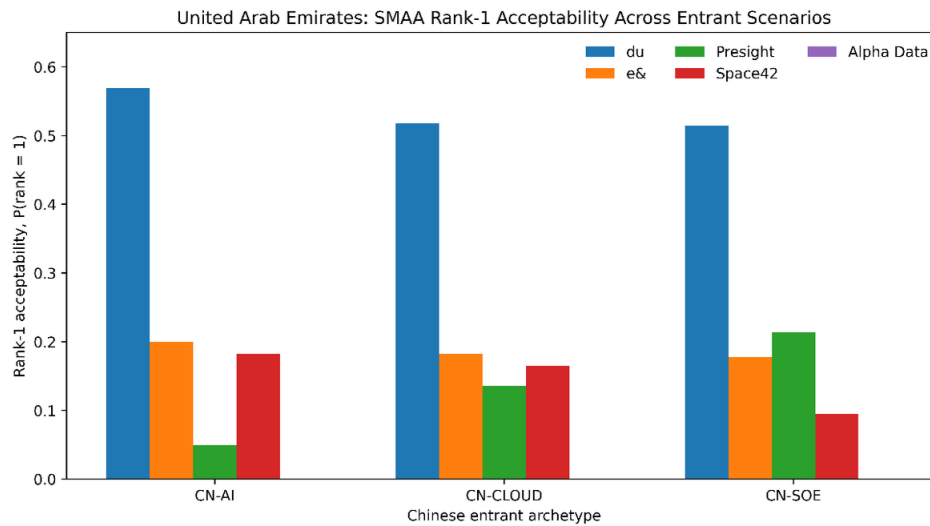


Figure 2. SMAA rank-one acceptability across Chinese entrant scenarios: United Arab Emirates (Authors' calculations based on the harmonized public-data dataset).

The pre-specified robustness analysis produced two sets of results that materially qualify the base rankings. The principal alternative specifications are presented in Table 3. Most alternative specifications preserved the Saudi and UAE leaders, but one pre-specified sensitivity in each market produced a genuine leader reversal.

Table 3. Key robustness tests and leader stability

Market	Scenario	Robustness specification	Leader	P(rank = 1)	Change from base
Saudi Arabia	CN-AI	Base hierarchical SMAA	ELM	0.6386	—
Saudi Arabia	CN-AI	Thiqah-adjusted ELM growth	2P	0.4616	Yes
Saudi Arabia	CN-CLOUD	Thiqah-adjusted ELM growth	ELM	0.6101	No
Saudi Arabia	CN-SOE	Thiqah-adjusted ELM growth	ELM	0.6092	No
UAE	CN-AI	Base hierarchical SMAA	du	0.5690	—
UAE	CN-AI	Criterion-level Dirichlet	e&	0.5460	Yes
UAE	CN-CLOUD	Criterion-level Dirichlet	e&	0.5257	Yes
UAE	CN-SOE	Criterion-level Dirichlet	e&	0.5134	Yes

For Saudi Arabia, equal weights, unconstrained criterion-level weights, rank normalization, AZM exclusion and the re-entry of the MURGC-screened firm all left ELM in first place. The exception was the CN-AI M&A comparability test. When ELM's revenue-growth input was adjusted using the approximate Thiqah contribution, 2P became the first-ranked candidate, with $P(\text{rank} = 1) = 46.16\%$ and an expected rank of 1.855. The same adjustment did not overturn ELM in the CN-CLOUD or CN-SOE scenarios.

The UAE sensitivity pattern was structurally different. du remained the leader under equal weights, rank-based normalization, M&A-adjusted revenue growth and a wider ± 0.50 percentage-point V3 proxy interval. However, when the hierarchical VAIR architecture was removed and all individual criteria received unconstrained Dirichlet weights, e& became the leading firm in every entrant scenario, with first-rank probabilities of 54.60%, 52.57% and 51.34%. This result indicates that the main UAE uncertainty is not driven by the operating-margin proxy or acquisition adjustments, but by the architecture through which decision preferences are structured.

All six country-by-entrant primary simulations satisfied the pre-specified convergence criterion. The maximum change in rank-one acceptability between 50,000 and 100,000 iterations was 0.00275 in Saudi Arabia and 0.00138 in the UAE, both well below the 0.005 threshold. Consequently, extension to 250,000 iterations was not required.

The secondary pooled-GCC sensitivity exercise, in which V1 was intentionally removed to improve cross-market comparability, produced a different cross-market pattern and was therefore retained only as sensitivity evidence. du had the lowest expected rank under CN-AI and CN-CLOUD, whereas Presight had the lowest expected rank under CN-SOE. Notably, du still had the larger probability of attaining first place within the sampled preference space in the pooled CN-SOE simulation. The difference between expected rank and first-rank probability reinforces the rationale for reporting the full stochastic distribution rather than reducing the analysis to a single deterministic league table.

Taken together, the results provide a clear distinction between stable recommendations and recommendations contingent upon preference architecture or measurement choices. The method therefore identifies not only which candidate tends to rank first, but also the conditions under which that conclusion survives—or fails—when assumptions about acquisition

comparability, criterion weighting, normalization, missing evidence and eligibility are altered.

To provide an external plausibility check on the *ex ante* model, five publicly documented Chinese–local technology relationships, including partnerships, announced collaborations, and memoranda of understanding were compared with the VAIR–SMAA results. Cases were retained when the foreign counterparty was a Chinese technology firm, the local organization belonged to the study’s candidate pool, the announced relationship concerned digital, ICT, cloud, cybersecurity, or infrastructure activities, and the underlying agreement, announcement, or memorandum was documented in an official corporate or exchange source [24–28]. Huawei-related cases were benchmarked against CN-CLOUD as the closest functional entrant archetype, whereas the China Mobile International–e& relationship was benchmarked against CN-SOE. Because several documented relationships pre-date the FY2025 measurement window, this exercise is interpreted as a retrospective consistency check rather than a test of predictive accuracy. The relationships, their corresponding model positions, and the resulting consistency classifications are presented in Table 4.

Table 4. *Retrospective consistency of documented Chinese–local technology relationships with VAIR–SMAA*

Chinese entrant	Market	Documented local counterparty	Documented collaboration	Closest scenario	Model position*	Consistency
Huawei	Saudi Arabia	solutions by stc	Strategic technology-partnership activity, including managed SASE solutions with Huawei [24]	CN-CLOUD	3/5 (ER=3.530)	Partial
Huawei	Saudi Arabia	2P	Knowledge transfer and cooperation in network infrastructure and modern data centres [25]	CN-CLOUD	2/5 (ER=2.123)	Strong
Huawei	Saudi Arabia	MIS	Memorandum of understanding to explore joint development of advanced cybersecurity solutions [26]	CN-CLOUD	4/5 (ER=3.950)	Divergent
Huawei	United Arab Emirates	du	Renewal of a long-standing ICT relationship with training and talent-development initiatives in AI, data analytics, 5G, and cloud [27]	CN-CLOUD	1/5 (ER=1.940)	Strong
China Mobile International	United Arab Emirates	e& (then Etisalat)	Smart Hub data-center colocation and international connectivity partnership [28]	CN-SOE	3/5 (ER=2.796)	Partial

Note: Model position is based on ascending expected-rank ordering within the relevant country and entrant scenario; a lower expected-rank value indicates a more favourable average model position. The reported positions do not represent observed alliance success. The MIS–Huawei source describes a memorandum of understanding.

The retrospective comparison shows directional but not complete correspondence between model outputs and observed partner choices. Two of the five documented local counterparties occupy the top two model positions, two rank third, and one ranks fourth; thus, four of the five documented counterparties fall within the upper three positions of the relevant candidate set. This pattern should not be interpreted as an 80% prediction rate or as statistical validation. Realized alliances may reflect negotiated commercial terms, incumbent relationships, procurement constraints, project timing, geopolitical considerations and other non-public information that cannot be represented in a public-data model. Moreover, large technology firms may maintain several local partnerships simultaneously for different technologies or projects. The MIS–Huawei case, where the realized partner ranks fourth, is therefore substantively informative rather than a model failure: it illustrates the difference between an *ex ante* screening architecture and the broader set of transaction-specific factors that shape actual alliance formation. The exercise consequently provides a limited external plausibility check while preserving the role of VAIR–SMAA as a decision-screening framework rather than a substitute for partner-specific due diligence. Because some sources document only announced or preliminary agreements, the cases should not all be treated as independently verified completed operational alliances.

5. DISCUSSION

The findings suggest that local partner selection for Chinese technology firms entering Saudi Arabia and the United Arab Emirates is better understood as a conditional matching problem than as a search for a universally superior firm. Within Saudi Arabia, ELM was the base-model leader across all three entrant archetypes, although the strength of that result varied by scenario. Its position remained particularly stable for CN-CLOUD and CN-SOE, whereas the CN-AI result became sensitive to the treatment of acquisition-related revenue growth, under which 2P moved into first place. In the UAE, du led all three hierarchical VAIR models, but e& became the preferred candidate when the hierarchical weighting structure was replaced by unconstrained criterion-level weights. These reversals are substantively important because they distinguish recommendations that remain stable across plausible assumptions from those that depend on how strategic priorities and measurement choices are represented.

This pattern is consistent with alliance research showing that partner attractiveness depends on both institutional conditions and alliance purpose. Hitt et al. [8] demonstrated that institutional environments affect the partner attributes firms value, while Meyer et al. [9] emphasized the joint role of resources and institutions in foreign-entry strategy. Shah and Swaminathan [10] likewise showed that the importance of partner-selection attributes varies across alliance contexts.

The present findings extend this reasoning to Chinese technology entry into Saudi Arabia and the UAE: the relative attractiveness of a local firm changes not only with its own capabilities but also with the entrant profile, the institutional interfaces that must be bridged, and the decision-maker's tolerance for uncertainty.

The theoretical implications of these findings extend in three closely related directions. First, for strategic-alliance partner selection, the results reinforce the view that complementarity should be evaluated relationally rather than as a fixed property of an individual firm. Second, from the springboard perspective on emerging-market internationalization [3], local partners can be understood not merely as market-access vehicles but as mechanisms through which Chinese technology firms acquire institutional access, implementation capacity and locally embedded resources that accelerate international expansion. Third, the findings add an institutional dimension to partner-selection theory by showing that technological capability and institutional embeddedness can be jointly valuable in state-influenced digital markets. Candidates combining strong technological resources with repeated engagement in public, regulated or nationally strategic settings generally occupied stronger positions than firms whose advantages were concentrated in a single dimension. This supports the argument that institutional bridging should be treated as part of partner value rather than as an external background condition.

Reciprocity provides a further explanation for the scenario-dependent rankings. Consistent with the two-sided matching logic developed by Mindruta et al. [12], the results show that partner value depends on what each side contributes to the prospective relationship. Presight, for example, became more competitive under CN-SOE than under CN-AI, while Space42 moved in the opposite direction. Such changes are difficult to explain through a static measure of local-firm quality alone. They arise because the strategic fit of the relationship changes with the entrant. The symmetric 50:50 treatment of partner-to-entrant and entrant-to-partner value in the base model should therefore be understood as a neutral analytical baseline, not as an assumption that bargaining power is equal in actual negotiations. Its purpose is to preserve the two-sided structure of the decision when no defensible evidence supports an asymmetric alternative.

The stochastic modelling results also demonstrate why deterministic weighted rankings can obscure important uncertainty. ELM and du were the most frequently first-ranked candidates in their respective base models, but neither conclusion was completely assumption-free. SMAA made this visible through rank acceptability, expected rank and robustness analysis rather than collapsing the evidence into a single composite score. This interpretation is consistent with the methodological rationale of SMAA [13, 14, 22, 23]. The secondary coding-consistency assessment also yielded satisfactory reliability for the documentary constructs ($\alpha=0.840$), providing additional evidence of internal coding consistency, although it does not establish the external validity of the underlying construct measures. Nevertheless, neither coding reliability nor stochastic robustness eliminates substantive uncertainty. A high probability of ranking first should therefore be interpreted as robustness across admissible preference and information states, not as the probability that an eventual alliance will succeed.

The retrospective comparison with publicly announced Chinese–local technology relationships adds a limited external plausibility check to these *ex ante* results. Among the five documented relationships examined, two local counterparties occupied one of the top two model positions, two ranked third, and one ranked fourth; thus, four of the five cases fell within the upper three positions of the relevant candidate set. This limited correspondence is informative, but it should not be interpreted as an 80% prediction rate or as formal predictive validation because several partnerships pre-date the FY2025 measurement window. The divergent MIS–Huawei memorandum-of-understanding case is particularly informative: it illustrates that actual partner choice can reflect negotiated terms, incumbent relationships, procurement requirements, project timing, geopolitical considerations and other non-public factors that are intentionally outside a public-data framework. The retrospective exercise therefore supports the external plausibility of VAIR–SMAA as a screening architecture while also clarifying its boundary: it complements, rather than replaces, partner-specific due diligence and negotiation.

Taken together, the results address the main gaps identified at the outset while also defining the limits of the contribution. The level-of-analysis gap is reduced by moving from country-level explanations of Chinese outward investment [1–5] to identifiable local partner alternatives within two selected host markets. The operationalization gap is addressed by translating complementarity, institutional access, integrity and alliance capability into a traceable firm-level assessment architecture. The reciprocity gap is addressed through entrant-specific two-directional fit, while the uncertainty gap is addressed through interval-valued evidence, stochastic preferences and robustness analysis. The retrospective comparison further shows that the framework produces rankings broadly consistent with several publicly documented partner relationships and announcements, without establishing completed partnership performance or deterministic predictive validity.

A broader practical implication is that transparent decision analytics can make technology-partnership choices more auditable for managers, regulators, and other stakeholders. In fast-changing digital markets, making assumptions, evidence quality, and robustness visible is itself important for informed technology governance and evidence-based regional development.

6. CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

This study examined how Chinese technology firms can compare prospective local partners in Saudi Arabia and the United Arab Emirates when partner attractiveness is multidimensional, reciprocal, and subject to incomplete information and uncertain preferences. The findings suggest that such decisions can be structured more defensibly by separating four questions: what value the partner contributes, what institutional access it facilitates, whether minimum integrity conditions are satisfied, and whether the relationship creates reciprocal strategic value. The VAIR–Veto–SMAA architecture operationalizes these questions without requiring a single predetermined set of criterion weights.

Empirically, ELM emerged as the strongest Saudi base-model candidate across the three entrant archetypes, although its CN-AI advantage over 2P was sensitive to acquisition-adjusted revenue growth. In the UAE, du led under the hierarchical VAIR specification, whereas e& became the preferred candidate when criterion weights were allowed to vary without the dimensional hierarchy. The retrospective comparison with five documented Chinese–local technology relationships and announcements provided a limited external plausibility check: four of the five identified local counterparties fell within the upper three positions of the relevant model ranking. This correspondence is encouraging but should not be interpreted as formal predictive validation. Taken together, the findings indicate that partner recommendations are most useful when expressed conditionally, with explicit attention to the assumptions under which a ranking remains stable.

For managers considering specific international partnerships, the principal implication is that structured partner screening should precede negotiation and should not be reduced to financial scale, market reputation, or a single measure of strategic fit. The framework can help identify candidates that remain competitive across alternative preference structures and can also signal situations in which additional due diligence is warranted before commitment. Its principal value therefore lies in improving the transparency and robustness of the screening stage rather than replacing managerial judgment.

The present study nevertheless has several important methodological, empirical, and interpretive limitations. First, V4, A2 and R1 rely partly on documentary coding and therefore remain exposed to interpretive judgment, although the secondary coding-consistency assessment produced satisfactory agreement ($\alpha=0.840$). This result reduces, but does not eliminate, the possibility of coding subjectivity. Second, SMAA rank acceptabilities and related probability measures represent robustness across admissible preference and information states; they are not probabilities that a future alliance will succeed. Third, the framework is based on public information and therefore cannot incorporate potentially important non-public determinants of partner choice, including political or institutional relationships, bargaining power, managerial trust, negotiated commercial terms, proprietary technological compatibility, and confidential strategic information. Such factors may be particularly consequential in relationship-intensive and state-influenced business environments. The three Chinese entrant profiles are also analytical archetypes and the empirical candidate pool is limited to Saudi Arabia and the United Arab Emirates rather than the full GCC. Fourth, the candidate set is purposive and bounded rather than exhaustive, so firms outside the screened set may also constitute credible partners. Fifth, the symmetric 0.50–0.50 directional weighting in R2 was retained as a neutral baseline and was not stress-tested against empirically elicited asymmetric bargaining preferences. Finally, the retrospective collaboration check is temporally non-contemporaneous with the FY2025 measurement window and therefore cannot establish predictive validity.

Future research can extend the framework to Qatar, Kuwait, Bahrain and Oman, apply it to named Chinese entrants, and incorporate managerial or expert evidence as an additional—not substitutive—information layer. A particularly valuable next step would be prospective validation in which ex ante VAIR–SMAA recommendations are recorded before partnership formation and then compared with both actual partner choices and subsequent alliance performance. Such designs would allow future studies to distinguish more clearly between decision-stage robustness and the longer-term effectiveness of realized partnerships.

Author Contributions

Milad Mohammadi—conceptualization, methodology, data curation, formal analysis, visualization, and writing—original draft; Wensong Zhang—supervision, methodology, validation, and writing—review and editing. Both authors reviewed and approved the final version of the manuscript and accept responsibility for their respective contributions.

Conflicts of Interest

The authors declare that they have no conflicts of interest relevant to the research, authorship, or publication of this manuscript.

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Data Availability

The public-source extraction matrix, coding dictionary, simulation outputs, source hashes, and analysis code described in the manuscript are available from the authors upon reasonable request.

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