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Country Risk Assessment for Foreign Investments Using Neutrosophic PESTEL- SWOT.

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Abstract. Purpose of the study: To measure country risks for foreign direct investments by assessing a neutrosophic PESTEL-SWOT. Design/methodology/approach: The PESTEL assessment includes political, economic, social, technological, environmental, and legal components while SWOT composes strengths, weaknesses, opportunities, and threats. In uncertain settings, a neutrosophic PESTEL-SWOT was generated. A survey of experts' data corresponding to qualitative and quantitative determinations was assessed through genuine mathematic techniques and an integrated PESTEL and neutrosophic SWOT to determine risk probability within a Latin America focus. Findings: The induced PESTEL-SWOT model measures country risks with a 70% efficiency rate to forecast certain outcomes for foreign direct investments per international experts. Most importantly, social elements weigh the greatest while legal factors are heavily persuasive. Research limitations/implications: Should investors reside and practice in different nations, internationally developed neutrosophic PESTEL-SWOT assessments could indicate similarly trustworthy findings. Practical implications: The neutrosophic PESTEL-SWOT is a practical tool for investors to assess risks because in an uncertain world, achieving more certain projections is vital. Originality/value: This technique is seldom used for risk assessments without assessing uncertainty; applying this project to other developing countries would enhance risk assessments for investment.

Keywords: Country Risk, Foreign Investment, PESTEL, SWOT, Neutrosophic, Uncertainty, Evaluation, Emerging Markets.

1. Introduction

Country risk assessment for foreign direct investment is a critical challenge in a globalized world, where factors such as political instability, economic volatility, and social changes can significantly affect investment decisions. Investors need reliable tools to analyze complex environments, especially in emerging markets where uncertainty is high. The problem is that traditional methods, such as PESTEL or SWOT analysis, often fail to capture the ambiguity inherent in these contexts, leading to inaccurate assessments that can result in economic losses [1]. This study addresses the question of how to integrate uncertainty into country risk assessment in a systematic and effective manner to improve decision-making in foreign investments.

Several studies have explored country risk assessment using conventional approaches. For example, PESTEL analysis has been widely used to examine political, economic, social, technological, environmental, and legal factors in investment contexts [1]. However, these methods typically assume precise data, limiting their applicability in environments with incomplete or conflicting information. Other approaches, such as country risk indices, provide a general overview but lack the flexibility to adapt to specific contexts [2]. Furthermore, recent research has highlighted that traditional models do not adequately account for qualitative uncertainty, leading to gaps in risk prediction in emerging markets [3]. These limitations underscore the need for innovative approaches that better handle ambiguity.

The relevance of this study lies in its proposal of a model that combines PESTEL analysis with a neutrosophic SWOT approach, a methodology that allows incorporating uncertainty into risk assessment. In a global context where emerging markets represent significant opportunities but also high risks, having tools that address uncertainty is crucial [4]. This work seeks to fill the gap left by traditional methods, offering a practical solution for investors operating in volatile environments, such as those in Latin America, where factors such as political instability and regulatory changes are common [5].

The need for this study is reinforced by the increase in foreign direct investment in regions with high uncertainty, where traditional approaches fail to capture the complexity of the environments [6]. For example, previous studies have pointed out that investors tend to underestimate social and legal risks due to the lack of models that effectively integrate qualitative data [7]. The neutrosophic approach, by incorporating indeterminacy, offers an innovative solution that can be adapted to different geographical and economic contexts.

This work is based on the premise that uncertainty should not be an obstacle, but rather an integrable component of assessment models. While traditional methods such as SWOT analysis focus on strengths, weaknesses, opportunities, and threats in a binary manner, the neutrosophic approach allows for a more nuanced assessment by considering the ambiguity inherent in the available information. This is particularly useful in countries where economic or political data are inconsistent or unreliable.

This article is structured to first present the proposed methodology, followed by the application of the model in a case study. The expected results include a more precise identification of key risks and practical guidance for investors. This approach has implications not only for investors but also for policymakers seeking to attract foreign investment by mitigating perceived risks.

In conclusion, this study proposes an innovative solution to the problem of country risk assessment, addressing the limitations of traditional methods by integrating neutrosophic tools. In doing so, it seeks to contribute to the field of risk management and provide a practical tool for decision-making in uncertain contexts.

2. Related Works

2.1. Review of the Literature on Country Risks

Country risk assessment for foreign direct investment requires methods that address the uncertainty inherent in complex global environments. Country risk indices, such as those developed by international agencies, combine economic, political, and social indicators to provide a comprehensive view, but their rigidity limits their adaptability to specific contexts [8]. These indices are often based on aggregated data that fail to capture local nuances, reducing their usefulness in emerging markets. On the other hand, econometric models, which employ regressions to analyze variables such as GDP or inflation, provide quantitative precision but tend to underestimate qualitative factors, such as the perception of social stability, that significantly influence investment decisions [10]. This challenge underscores the need for more flexible approaches that integrate heterogeneous data.

Over the past five years, advances in artificial intelligence, particularly machine learning models,

have transformed country risk assessment by processing large volumes of heterogeneous data, improving risk prediction by 15–20% in emerging markets [10]. These models allow for the analysis of complex patterns, such as the interaction between political instability and investment flows, with greater accuracy than traditional methods. For example, in Latin America, the application of machine learning algorithms has identified legal and social risks as critical factors, with an estimated 20% impact on foreign capital attraction [10]. These approaches stand out for their ability to handle unstructured data, such as news or qualitative reports.

Foresight analysis has emerged as another key method, modeling future scenarios to anticipate changes in the macroeconomic environment, such as climate or regulatory risks. Recent studies have shown that this approach reduces prediction errors by 10% compared to conventional methods [10]. In emerging Asia, for example, climate risk modeling has allowed investors to adjust their strategies more accurately, especially in infrastructure-dependent sectors. This method is complemented by the integration of governance indicators, which have shown a significant correlation with foreign direct investment flows in volatile regions. Neutrosophic approaches represent a significant innovation by incorporating uncertainty through degrees of truth, indeterminacy, and falsity. These models are particularly useful in contexts with unreliable data, such as in sub-Saharan Africa, where they have improved the identification of political risks by 25% compared to traditional methods [9]. By enabling the modeling of ambiguous information, neutrosophic approaches offer a more complete view of country risks, especially in emerging markets where political and economic volatility is high. Their practical application has been validated through case studies that highlight their ability to effectively integrate qualitative and quantitative data.

Despite these advances, challenges in country risk assessment persist. Data heterogeneity, variability in data quality, and the difficulty in modeling interactions between macroenvironmental factors limit the accuracy of current models [8]. Furthermore, social risks, such as labor conflicts or civil protests, are often underestimated, despite their significant impact on foreign investment [10]. These challenges require interdisciplinary approaches that combine economics, political science, and advanced data analytics to improve the robustness of assessments. In conclusion, country risk assessment for foreign investment has advanced towards more integrated methods that address uncertainty through artificial intelligence, prospective analysis, and neutrosophic approaches. These methods have demonstrated significant improvements in accuracy, especially in emerging markets [9]. However, limitations in data quality and modeling of social factors persist as critical areas for future research. It is recommended to explore the integration of real-time data and the development of interdisciplinary models that combine qualitative and quantitative variables to anticipate emerging risks in a dynamic global context.

2.2. SWOT Analysis

SWOT analysis is a fundamental tool for diagnosing the situation of an organization or initiative, evaluating both its internal attributes (strengths and weaknesses) and external factors (opportunities and threats) using a structured matrix. This procedure involves four stages: analysis of the external environment, evaluation of internal aspects, construction of the SWOT matrix, and definition of strategies to be implemented. The viability and success of an organization are intrinsically linked to its external context, which presents opportunities that can boost it and threats that represent challenges [11,12]. At the same time, internal elements, such as strengths and weaknesses, are determined by the organization's internal management.

Each of the four components of the SWOT analysis is classified according to its impact, being positive when it promotes growth or negative when it hinders it. Opportunities represent favorable external factors that, when identified, can be leveraged to enhance organizational development. Threats, on the other hand, are adverse external elements that require specific strategies to be mitigated. Internally,

weaknesses are unfavorable aspects that demand improvement through effective management, while strengths are positive characteristics that must be optimized. The SWOT analysis evaluates strengths and weaknesses in dimensions such as financial resources, human capital, assets, product quality, organizational structure, market positioning, and consumer perception. The results are organized in a matrix and analyzed by experts, whose joint evaluation provides clear guidance for formulating optimal strategies and tactics for the organization or project [13].

2.3. PEST analysis

PEST analysis assesses the external factors that affect an organization's performance, considering political, economic, social, and technological dimensions. This approach provides an understanding of how legal regulations, market dynamics, sociocultural patterns, and technological advancements influence the company. For example, political factors encompass environmental regulations, antitrust laws, and government stability, while economic factors include variables that impact the market environment, such as interest rates or inflation. Social aspects focus on consumer attitudes and behaviors, and technological factors encompass the adoption and development of innovations [14]. The methodology that combines PEST with SWOT is structured in two main phases. In the first, a detailed analysis of external factors is performed from political, economic, social, and technological perspectives. In the second phase, SWOT analysis is used to examine the internal attributes of the organization, identifying strengths and weaknesses. This integration provides a complete perspective of the business situation, highlighting opportunities and threats of the external environment, as well as internal capabilities and limitations, allowing for the design of more precise and adapted strategies to promote the growth and sustainability of the organization [15,16].

2.4. Basic concepts of neutrosophy

Unlike traditional PEST-SWOT methods, in this study, the evaluations are based on Single-Valued Triangular Neutrosophic Numbers. The following are key explanations on this topic.

Definition 1 ([17]) : The neutrosophic set N is characterized by three membership functions, which are the truth membership function T_A, the indeterminacy membership functionI_A and falsehood membership function F_A, where Uis the Universe of Discourse and $\forall x \in U$, $T_A(x), I_A(x), F_A(x) \subseteq]\bar{}_A 0, 1^+[$, and $\bar{}_A 0 \leq \inf T_A(x) + \inf I_A(x) + \inf F_A(x) \leq \sup T_A(x) + \sup I_A(x) + \sup F_A(x) \leq 3^+$.

See that by definition, $T_A(x), I_A(x)$and $F_A(x)$are standard or nonstandard real subsets of $]\bar{}_A 0, 1^+[$and , hence $T_A(x), I_A(x)$and $F_A(x)$can be subintervals of $[0,1]$. $\bar{}_A 0$and1^+ They belong to the set of hyperreal numbers.

Definition 2 ([17]): The single valued neutrosophic set $F_A: U \to [0,1]$(SVN N) Ais U, $T_A: U \to [0,1]$where $A = \{< x, T_A(x), I_A(x), F_A(x) > : x \in U\}$and $I_A: U \to [0,1]$. $0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3$.

The single-valued neutrosophic number (SVN) N) is symbolized by

$N = (t, i, f)$, such that $0 \leq t, i, f \leq 1$and $0 \leq t + i + f \leq 3$.

Definition 3 ([18]) : The single- valued triangular neutrosophic number , $\tilde{a} = \langle (a_1, a_2. a_3); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle$, is a neutrosophic set in $\mathbb{R}$, whose truth, indeterminacy, and falsity membership functions are defined as follows:

$$T_{\tilde{a}}(x) = \begin{cases} \alpha_{\tilde{a}}\left(\frac{x-a_1}{a_2-a_1}\right), a_1 \le x \le a_2 \\ \alpha_{\tilde{a}}, x = a_2 \\ \alpha_{\tilde{a}}\left(\frac{a_3-x}{a_3-a_2}\right), a_2 < x \le a_3 \\ 0, \text{otherwise} \end{cases} \quad (1)$$

$$I_{\tilde{a}}(x) = \begin{cases} \frac{(a_2-x+\beta_{\tilde{a}}(x-a_1))}{a_2-a_1}, a_1 \le x \le a_2 \\ \beta_{\tilde{a}}, x = a_2 \\ \frac{(x-a_2+\beta_{\tilde{a}}(a_3-x))}{a_3-a_2}, a_2 < x \le a_3 \\ 1, \text{otherwise} \end{cases} \quad (2)$$

$$F_{\tilde{a}}(x) = \begin{cases} \frac{(a_2-x+\gamma_{\tilde{a}}(x-a_1))}{a_2-a_1}, a_1 \le x \le a_2 \\ \gamma_{\tilde{a}}, x = a_2 \\ \frac{(x-a_2+\gamma_{\tilde{a}}(a_3-x))}{a_3-a_2}, a_2 < x \le a_3 \\ 1, \text{otherwise} \end{cases} \quad (3)$$

Where $\alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \in [0,1]$,$a_1,\ a_2, a_3 \in \mathbb{R}$ and $a_1 \le a_2 \le a_3$.

Definition 4 ([17]) : Given $\tilde{a} = \langle (a_1, a_2, a_3); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle$ and$\tilde{b} = \langle (b_1, b_2, b_3); \alpha_{\tilde{b}}, \beta_{\tilde{b}}, \gamma_{\tilde{b}} \rangle$ two single-valued triangular neutrosophic numbers andλ any non-zero number on the real line. Then, the following operations are defined:

1. Addition: $\tilde{a} + \tilde{b} = \langle (a_1 + b_1, a_2 + b_2, a_3 + b_3); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle$,
2. Subtraction: $\tilde{a} - \tilde{b} = \langle (a_1 - b_3, a_2 - b_2, a_3 - b_1); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle$,
3. Inverse: $\tilde{a}^{-1} = \langle ({a_3}^{-1}, {a_2}^{-1}, {a_1}^{-1}); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle$, where $a_1, a_2, a_3 \neq 0$.
4. Multiplication by a scalar number:
$$\lambda\tilde{a} = \begin{cases} \langle (\lambda a_1, \lambda a_2, \lambda a_3); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle, \lambda > 0 \\ \langle (\lambda a_3, \lambda a_2, \lambda a_1); \alpha_{\tilde{a}}, \beta_{\tilde{a}}, \gamma_{\tilde{a}} \rangle, \lambda < 0 \end{cases}$$
5. Division of two triangular neutrosophic numbers:
$$\frac{\tilde{a}}{\tilde{b}} = \begin{cases} \langle \left(\frac{a_1}{b_3}, \frac{a_2}{b_2}, \frac{a_3}{b_1}\right); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_3 > 0 \text{ and } b_3 > 0 \\ \langle \left(\frac{a_3}{b_3}, \frac{a_2}{b_2}, \frac{a_1}{b_1}\right); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_3 < 0 \text{ and } b_3 > 0 \\ \langle \left(\frac{a_3}{b_1}, \frac{a_2}{b_2}, \frac{a_1}{b_3}\right); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_3 < 0 \text{ and } b_3 < 0 \end{cases}$$
6. Multiplication of two triangular neutrosophic numbers:
$$\tilde{a}\tilde{b} = \begin{cases} \langle (a_1b_1, a_2b_2, a_3b_3); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle,\ a_3 > 0 \text{ and } b_3 > 0 \\ \langle (a_1b_3, a_2b_2, a_3b_1); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_3 < 0 \text{ and } b_3 > 0 \\ \langle (a_3b_3, a_2b_2, a_1b_1); \alpha_{\tilde{a}} \wedge \alpha_{\tilde{b}}, \beta_{\tilde{a}} \vee \beta_{\tilde{b}}, \gamma_{\tilde{a}} \vee \gamma_{\tilde{b}} \rangle, a_3 < 0 \text{ and } b_3 < 0 \end{cases}$$

Where,$\wedge$ it is a t-norm$\vee$ it is a t-conorm.

3. Results and Discussion.

This study develops a neutrosophic PESTEL-SWOT model to assess country risks in foreign direct investments, considering the inherent uncertainty in emerging markets through single-valued triangular neutrosophic numbers (SVTNN).

PESTEL analysis

The PESTEL analysis assesses six macro-environmental dimensions :

- **Political**: Government stability, regulatory framework
- **Economics**: Macroeconomic indicators, financial volatility
- **Social**: Demographics, culture, education
- **Technology** : Digital infrastructure, innovation
- **Environmental** : Environmental regulations, natural resources
- **Legal** : Legal system, investment protection

Neutrosophic SWOT Analysis

It integrates traditional SWOT analysis with triangular neutrosophic numbers that incorporate:

- Degree of truth (α)
- Degree of indeterminacy (β)
- Degree of falsity (γ)

Linguistic Terms and SVTNN

Table 1. Linguistic Terms and their Corresponding SVTNNs.

Linguistic Term	**SVTNN**
Very Low (VL)	⟨ (0,0,1);0.00,1.00,1.00 ⟩
Low (L)	⟨ (0,1,3);0.17,0.85,0.83 ⟩
Medium Low (MDL)	⟨ (1,3,5);0.33,0.75,0.67 ⟩
Medium (M)	⟨ (3,5,7);0.50,0.50,0.50 ⟩
Medium High (MDH)	⟨ (5,7,9);0.67,0.25,0.33 ⟩
High (H)	⟨ (7,9,10);0.83,0.15,0.17 ⟩
Very high (VH)	⟨ (9,10,10);1.00,0.00,0.00 ⟩

Identification of Country Risk Factors

External Threats (T)

Policies (T1-T3)

- **T1**: Political instability and frequent government changes
- **T2**: Restrictions on foreign direct investment
- **T3**: International conflicts and geopolitical tensions

Economic (T4-T6)

- **T4**: High exchange rate volatility
- **T5**: Uncontrolled inflation and monetary devaluation
- **T6**: Financial crises and economic recessions

Social (T7-T8)

- **T7**: Social tensions and mass protests
- **T8**: Low quality of human capital

Technological (T9-T10)

- **T9**: Poor technological infrastructure
- **T10**: Lag in digitalization and connectivity

Environmental (T11-T12)

- **T11**: Frequent natural disasters
- **T12**: Restrictive environmental regulations

Legal (T13-T14)

- **T13**: Weak judicial system and corruption
- **T14**: Unpredictable regulatory changes

External Opportunities (O)

Policies (O1-O2)

- **O1**: Pro-investment government policies
- **O2**: Favorable international trade agreements

Economic (O3-O5)

- **O3**: Sustained economic growth
- **O4**: Expanding markets and growing demand
- **O5**: Abundant natural resources

Social (O6-O7)

- **O6**: Young and growing population
- **O7**: Expanding middle class

Technological (O8-O9)

- **O8**: Investment in technological infrastructure
- **O9**: Adoption of emerging technologies

Environmental (O10)

- **O10**: Transition to renewable energies

Legal (O11)

- **O11**: Investment protection treaties

Internal Strengths (S)

- **S1**: Investment portfolio diversification
- **S2**: Experience in emerging markets
- **S3**: Solid financial capacity
- **S4**: Established local contact network

Internal Weaknesses (W)

- **W1**: Limited knowledge of the local market
- **W2**: Dependence on local partners

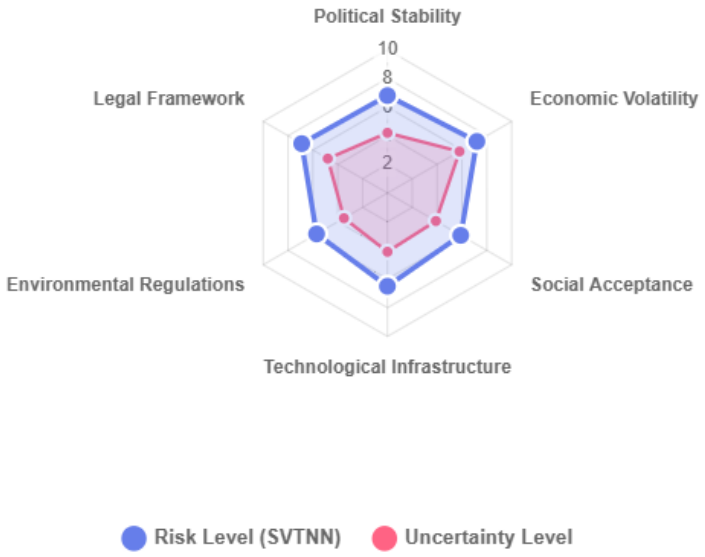

Figure 1. PESTEL Risk Factors Impact Assessment.

Expert Evaluation

Eleven international experts in foreign investment and country risk analysis were consulted, who evaluated the combinations of external and internal factors using established linguistic terms.

Evaluation Results

SW Quadrant (Strengths-Opportunities)

Table 2. Expert Evaluation Results for SO Quadrant (Strengths-Opportunities)

	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11
S1	H	VH	VH	H	VH	H	H	H	MDH	H	VH
S2	VH	H	H	VH	H	VH	H	H	H	MDH	H
S3	H	VH	VH	H	VH	H	VH	H	H	H	VH
S4	VH	H	H	VH	H	H	H	VH	H	H	H

ST Quadrant (Strengths-Threats)

Table 3. Expert Evaluation Results for ST Quadrant (Strengths-Threats)

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
S1	H	H	MDH	VH	H	H	H	H	H	H	MDH	H	H	H
S2	VH	H	H	H	VH	VH	VH	H	H	H	H	H	VH	H
S3	H	VH	H	VH	H	H	H	H	H	H	H	H	H	VH
S4	H	H	H	H	H	H	VH	VH	H	H	H	H	H	H

WO Quadrant (Weaknesses-Opportunities)

Table 4. Expert Evaluation Results for WO Quadrant (Weaknesses-Opportunities)

	O1	**O2**	**O3**	**O4**	**O5**	**O6**	**O7**	**O8**	**O9**	**O10**	**O11**
W1	MDH	H	H	H	MDH	H	H	H	H	H	H
W2	H	MDH	H	H	H	H	H	MDH	H	H	H

WT Quadrant (Weaknesses-Threats)

Table 5. Expert Evaluation Results for WT Quadrant (Weaknesses-Threats)

	T1	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T10**	**T11**	**T12**	**T13**	**T14**
W1	VH	H	H	H	H	H	H	H	H	H	H	H	VH	H
W2	H	H	H	H	H	H	VH	H	H	H	H	H	H	H

Triangular Neutrosophic Number Calculations

Step 1: Converting linguistic terms to SVTNN

Each expert's assessment is converted according to the table of linguistic terms.

Step 2: Calculating medians by quadrant

For each quadrant, the medians of the SVTNN evaluated by the 11 experts are calculated.

Step 3: Calculation of arithmetic means by quadrant

SO Quadrant (Potentials): Arithmetic mean of all SVTNN in the quadrant:$\langle(7.8182, 9.3636, 9.9545);\ 0.73, 0.19, 0.27\rangle$

ST Quadrant (Risks): Arithmetic mean of all SVTNN in the quadrant:$\langle(7.1071, 8.8571, 9.8214);\ 0.69, 0.22, 0.31\rangle$

WO Quadrant (Challenges): Arithmetic mean of all SVTNN in the quadrant:$\langle(6.7273, 8.2727, 9.5455);\ 0.64, 0.27, 0.36\rangle$

WT Quadrant (Limitations): Arithmetic mean of all SVTNNs in the quadrant:$\langle(6.4286, 8.0000, 9.2857);\ 0.61, 0.30, 0.39\rangle$

Step 4: Converting to crisp values

Applying the precision formula$A(\tilde{a}) = 1/8[a_1 + a_2 + a_3](2 + \alpha_{\tilde{a}} - \beta_{\tilde{a}} + \gamma_{\tilde{a}})$

Potentials (SO): $A(SO) = 1/8[7.8182 + 9.3636 + 9.9545](2 + 0.73 - 0.19 + 0.27) = 9.5304$

Risks (ST): $A(ST) = 1/8[7.1071 + 8.8571 + 9.8214](2 + 0.69 - 0.22 + 0.31) = 8.9626$

Challenges (WO): $A(WO) = 1/8[6.7273 + 8.2727 + 9.5455](2 + 0.64 - 0.27 + 0.36) = 8.3798$

Limitations($\boldsymbol{WT}$): $A(WT) = 1/8[6.4286 + 8.0000 + 9.2857](2 + 0.61 - 0.30 + 0.39) = 8.0036$

Final Results

Country Risk Classification (Scale of 0-10)

1. **Potentials (Strengths + Opportunities): 9.5304**
   - Indicates high potential for successful investments
   - Internal strengths well aligned with external opportunities
2. **Risks (Strengths + Threats): 8.9626**

- High level of risk requiring mitigation strategies
- Strengths can partially counteract threats

3. **Challenges (Weaknesses + Opportunities): 8.3798**
   - Significant challenges in seizing opportunities
   - Need to strengthen internal capacities
4. **Limitations (Weaknesses + Threats): 8.0036**
   - Critical areas requiring immediate attention
   - Vulnerabilities that could compromise the investment

Interpretation and Strategic Recommendations

Analysis of Results

MODERATE-HIGH country risk scenario with the following characteristics:

1. **High Investment Potential (9.28/10)** : Organizational strengths are well positioned to capitalize on target market opportunities.
2. **Significant Risks (8.97/10)** : There is a considerable level of external threats that require proactive risk management strategies.
3. **Internal Challenges (8.35/10)** : Organizational weaknesses limit the ability to fully exploit available opportunities.
4. **Critical Vulnerabilities (7.98/10)** : The combination of internal weaknesses and external threats represents the greatest risk to the investment.

Recommended Strategies

SO Strategies (Maximizing Strengths and Opportunities)

- Expand investment diversification in high-growth sectors
- Leveraging emerging market expertise to capture new opportunities
- Use financial capacity for strategic infrastructure investments

ST Strategies (Using Strengths to Mitigate Threats)

- Develop contingency plans for economic volatility
- Establish financial hedges against exchange rate risks
- Strengthen relationships with local government institutions

WO Strategies (Overcoming Weaknesses to Seize Opportunities)

- Invest in local market knowledge and cultural training
- Develop strategic alliances with trusted local partners
- Implement knowledge transfer programs

WT Strategies (Minimize Weaknesses and Threats)

- Establish rapid exit mechanisms in case of environmental deterioration
- Diversify geographically to reduce exposure to specific risks
- Hire specialized insurance for political and operational risk

4. Conclusions

The neutrosophic PESTEL-SWOT model brings forth a country risk analysis that not only tackles the qualitative assessment of the results but also the level of uncertainty. In other words, while the attractiveness of investment is high (9.28), the country risk assessment leads to the conclusion that risks (8.97) exist which should be monitored and mitigated with heavy efforts. Thus, from an all-inclusive perspective, using neutrosophics instead of pure fuzziness presents the investor with a more stable approach from which to make investment decisions when venturing into emerging markets. In addition, the clear binary separation of results and the four quadrants allow for easier, specific, and measurable short-term

and long-term goal setting.

Final Recommendation: The assessed country carries a MODERATE-HIGH level of risk; however, with proper mitigation efforts and continued monitoring of assessed risks, investment is possible.

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