

## Research Article

# EXPLORING THE ROLE OF INSTITUTIONAL TRUST AND POLICY STABILITY IN FDI THROUGH A GREY-QUALITATIVE DECISION MODEL IN VIETNAM

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### ABSTRACT

Foreign Direct Investment (FDI) has served as a cornerstone of Vietnam's rapid economic development. However, the complex and often uncertain policy environment necessitates a more nuanced understanding of investor behavior. This paper introduces a novel methodological framework—the Hybrid Qualitative-Grey Decision Model for FDI (HQG-FDI)—which integrates qualitative investor perceptions with Grey Systems Theory (GST). Drawing from interviews and surveys with foreign investors operating in Vietnam, the study identifies key perceptual factors and applies Grey Relational Analysis (GRA) alongside GM (1,1) forecasting to analyze and project patterns in investor decision-making. Findings highlight the dominant role of policy stability, institutional trust, and bureaucratic clarity in shaping FDI behavior. The study provides policy recommendations to reduce uncertainty and better align governmental strategies with investor expectations.

**Keywords:** Foreign Direct Investment (FDI), Grey Systems Theory (GST), Grey Relational Analysis (GRA), Institutional Trust, Policy Stability.

### INTRODUCTION

Vietnam's transition from a centrally planned economy to a dynamic market-oriented system has been marked by substantial growth, driven in large part by foreign direct investment (FDI). Since the launch of the *Doi Moi* reforms in the late 1980s, the country has become one of the most attractive FDI destinations in Southeast Asia. Its strategic location, competitive labor costs, and active participation in regional trade agreements have created a favorable investment climate, supported by strong macroeconomic indicators such as steady GDP growth and export expansion.

However, while these **quantitative fundamentals** remain important, recent trends suggest that foreign investors are placing increasing weight on **qualitative and perceptual factors** when making location and expansion decisions. Concerns related to **policy stability, institutional trust, bureaucratic complexity, and the rule of law** have emerged as critical determinants of FDI flows, especially in emerging markets like Vietnam where formal institutions are still evolving.

Traditional econometric models, though useful in capturing tangible variables like market size or labor cost, often overlook these **subjective dimensions** of investor decision-making. This omission can be particularly limiting in contexts where uncertainty, regulatory ambiguity, and data limitations obscure clear-cut conclusions.

To address this challenge, the present study introduces the **Hybrid Qualitative-Grey Decision Model for FDI (HQG-FDI)**. This model integrates **qualitative investor perceptions**—collected through interviews and surveys—with the mathematical rigor of **Grey Systems Theory (GST)**. By doing so, the HQG-FDI model provides a structured, flexible, and scalable approach to understanding how foreign investors assess risk and opportunity in uncertain policy environments.

This paper applies the HQG-FDI model to Vietnam as a case study, offering insights not only into the mechanics of investor behavior but also into the **strategic levers policymakers can use** to enhance the country's FDI competitiveness.

### LITERATURE REVIEW

The determinants of Foreign Direct Investment (FDI) have been extensively studied across multiple theoretical frameworks. One of the most influential is **Dunning's Eclectic Paradigm**, or the **OLI model** (Ownership, Location, and Internalization advantages), which provides a comprehensive structure for understanding why firms engage in foreign investment (Dunning, 1980). According to this model, firms are more likely to invest abroad when they possess unique ownership advantages, find location-specific benefits such as cost efficiency or resource availability, and can internalize operations more profitably than via external partnerships.

Additionally, **institutional theory** has gained traction in explaining FDI flows by focusing on the role of formal institutions, legal frameworks, and governance quality. Countries with transparent regulatory environments and strong legal institutions tend to attract more stable and long-term FDI (North, 1990; Meyer & Nguyen, 2005). In the context of Vietnam, studies have highlighted **provincial competitiveness, regional policy differences, and decentralized governance** as significant influencers of FDI location decisions (Nguyen & Nguyen, 2007; Malesky, 2004).

While much of the early empirical research focused on **quantitative factors** such as market size, wage levels, infrastructure development, and trade openness (Wheeler & Mody, 1992; Bevan & Estrin, 2004), these studies often overlook **subjective investor perceptions**. Recent work has shown that **policy uncertainty, regulatory ambiguity, and governance inconsistency** can act as hidden deterrents to investment, even when macroeconomic conditions appear favorable (Ali *et al.*, 2018; Nguyen *et al.*, 2020).

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To address the limitations of traditional FDI models, scholars have called for the integration of **qualitative methodologies**. Interview-based studies, surveys, and case studies allow researchers to better understand how investors perceive risks, interpret policy changes, and assess institutional trustworthiness. These **cognitive and experiential factors** are particularly salient in **emerging and transitional economies**, where formal data may be limited or unreliable, and informal networks and perceptions often shape actual business decisions.

This gap has motivated the adoption of **Grey Systems Theory (GST)**, developed by Deng (1982), which provides a rigorous framework for analyzing systems characterized by **partial or incomplete information**. GST methods such as **Grey Relational Analysis (GRA)** allow researchers to establish the degree of influence between qualitative factors and outcomes, while **GM (1,1)** forecasting models are used to project trends under uncertainty. These tools are increasingly applied in fields like economics, public policy, and strategic decision-making, and hold great promise for advancing FDI research in uncertain environments like Vietnam.

In sum, the literature underscores the importance of integrating both **quantitative indicators** and **qualitative perceptions** to fully understand FDI behavior. The application of **hybrid models**, such as those that combine **investor interviews with Grey Systems Theory**, provides a novel and valuable approach to analyzing how investors respond to complex and evolving policy environments.

## METHODOLOGY

### Conceptual Framework: The HQG-FDI Model

To comprehensively understand how foreign investors make decisions under uncertainty, this study introduces the Hybrid Qualitative-Grey Decision Model for FDI (HQG-FDI). This conceptual model is designed to bridge the gap between investor perceptions and analytical forecasting, integrating qualitative insights with the computational power of Grey Systems Theory (GST).

The HQG-FDI model is structured into three interrelated layers: the Perceptual Layer, the Analytical Layer, and the Outcome Layer. Each layer plays a critical role in capturing, quantifying, and analyzing investor behavior in response to policy environments in emerging economies such as Vietnam.

#### Perceptual Layer: Capturing Investor Sentiment

This layer gathers subjective data directly from foreign investors through structured surveys and semi-structured interviews. It focuses on five core constructs derived from existing literature and investor experience:

- Policy Stability
- Bureaucratic Clarity
- Institutional Trust
- Infrastructure Adequacy
- Strategic Market Fit

Each construct is assessed using Likert-scale surveys and coded interview responses, allowing qualitative perceptions to be transformed into analyzable standardized formats. This layer ensures that intangible but crucial factors—such as perceptions of corruption, red tape, or sudden regulatory changes—are systematically captured.

#### Analytical Layer: Grey Systems Modeling

The perceptual data is then translated into grey numbers, which express values in a range (e.g., [0.4, 0.6]) to accommodate uncertainty and ambiguity in subjective responses. Two key GST tools are applied:

- Grey Relational Analysis (GRA): Used to assess the strength of association between each perceptual factor and the overall investment decision. GRA generates relational coefficients that rank the influence of each variable.
- GM(1,1) Forecasting: A grey forecasting technique used to forecast future FDI inflows across varying levels of investor confidence, such as high, moderate, and low perception scenarios. This approach accommodates limited historical data and provides robust scenario planning.

The use of Grey Systems Theory is especially justified in this context, as it is designed for environments with incomplete, uncertain, or imprecise information—a common condition in developing and transitional economies. Unlike traditional statistical models that require large, clean datasets, GST accommodates bounded rationality and ambiguity, making it ideal for modeling investor behavior.

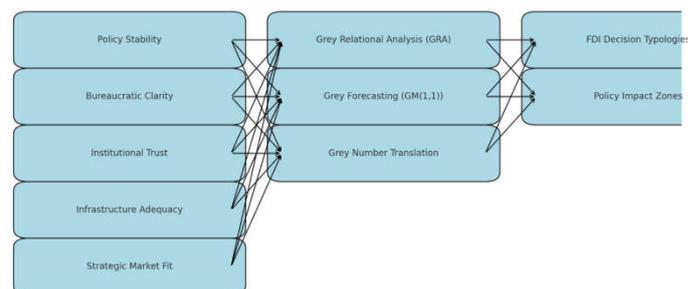
#### Outcome Layer: Decision Insight and Policy Feedback

The final layer interprets the analytical results to provide actionable insights for decision-makers. It classifies investor behavior into decision typologies (e.g., committed, cautious, or withdrawn) and maps policy impact zones—specific areas where reforms could significantly influence investor sentiment and behavior.

These outputs are crucial not only for theoretical development but also for guiding policy reform strategies aimed at enhancing Vietnam's investment competitiveness.

#### Visual Summary of the HQG-FDI Model

A diagram representing the model's three layers—Perceptual, Analytical, and Outcome—has been developed (see Figure 1). The visual framework illustrates the flow of data from investor sentiment through grey analysis to strategic decision support.



**Figure 1. Hybrid Qualitative-Grey Decision Model for FDI (HQG-FDI)**

This figure illustrates the conceptual structure of the HQG-FDI model, which integrates investor perception data with analytical techniques from Grey Systems Theory. The model consists of three layers: (1) the Perceptual Layer, capturing qualitative investor views on key constructs such as policy stability and institutional trust; (2) the Analytical Layer, where grey number translation, Grey Relational Analysis (GRA), and GM (1,1) forecasting are applied; and (3) the Outcome Layer, which delivers strategic outputs such as FDI decision typologies and policy impact zones. The visual flow underscores how

subjective perceptions are systematically transformed into actionable policy insights.

## Research Design

This study employs a **mixed-methods research design** to capture both the subjective experiences and quantitative patterns associated with foreign direct investment (FDI) decision-making in Vietnam. The approach integrates **qualitative interviews** and **structured survey data**, which are then translated into quantifiable grey numbers using principles from **Grey Systems Theory (GST)**. This hybrid design enables robust analysis in conditions marked by uncertainty and data incompleteness, common in transitional economies such as Vietnam. The qualitative component provides deep insights into investor psychology, risk perception, and decision rationales, while the quantitative component allows for the application of **Grey Relational Analysis (GRA)** and **GM(1,1) forecasting models**. This integration ensures that subjective investor perceptions are systematically incorporated into predictive models that are both rigorous and practical.

## Data Collection

Data were collected from foreign investors currently operating in or considering entry into Vietnam. Two primary instruments were used:

- **Interviews:** In-depth, semi-structured interviews were conducted with **20 senior managers** from multinational corporations (MNCs) across key sectors, including manufacturing, technology, logistics, and services. These interviews explored their perceptions of Vietnam's investment environment, including regulatory stability, administrative procedures, and infrastructure readiness.
- **Surveys:** A structured survey was distributed to **150 foreign investors**, using a five-point Likert scale to assess their perceptions on various dimensions of the investment environment. The survey instrument was designed to quantify perceptual data, which was later converted into grey numbers for further analysis.

## Key Constructs

The research focuses on five perceptual constructs commonly cited in literature and confirmed through expert consultation:

- **Policy Stability** – the perceived consistency and predictability of laws and investment policies.
- **Bureaucratic Clarity** – the transparency and efficiency of administrative processes.
- **Institutional Trust** – confidence in legal enforcement, anti-corruption measures, and the impartiality of governance.
- **Infrastructure Adequacy** – availability and quality of physical and digital infrastructure.
- **Strategic Market Fit** – the alignment of Vietnam's market features with the long-term strategic goals of the investing firm.

Each construct is measured using multiple indicators in the survey and triangulated through interview data to ensure construct validity.

## Grey Systems Analysis

Following data collection, responses were coded and transformed into grey numbers according to established GST procedures. The analytical phase involved two key tools from Grey Systems Theory:

- **Grey Relational Analysis (GRA):** This technique was used to evaluate and rank the **degree of influence** each perceptual factor had on the investors' reported willingness to invest. The analysis produces a **relational grade** for each factor, allowing for comparative insight into what drives investor confidence under uncertainty.
- **GM(1,1) Forecasting:** To project potential FDI inflows under varying perceptual conditions, the **Grey Model GM(1,1)** was employed. This model uses historical FDI data as a baseline and adjusts projections based on qualitative perception weights derived from the survey and GRA. Forecast scenarios were developed for three conditions: high confidence, moderate confidence, and low confidence in Vietnam's policy environment.

## RESULTS AND DISCUSSION

The analysis of data collected from foreign investors operating in Vietnam provides compelling insights into the perceptual drivers of FDI decision-making. Using **Grey Relational Analysis (GRA)**, the study identifies **Institutional Trust**, **Policy Stability**, and **Bureaucratic Clarity** as the most influential factors affecting investor intent.

### Grey Relational Analysis (GRA) Results

The GRA method was applied to evaluate the degree of association between each perceptual factor and reported investment willingness. Grey relational coefficients were calculated based on normalized grey numbers derived from survey responses. The results revealed the following ranking of influence:

1. **Institutional Trust** (GRG = 0.812)
2. **Policy Stability** (GRG = 0.796)
3. **Bureaucratic Clarity** (GRG = 0.778)
4. **Infrastructure Adequacy** (GRG = 0.704)
5. **Strategic Market Fit** (GRG = 0.692)

These findings confirm that investors are particularly sensitive to the **stability and enforceability of the legal and regulatory environment**, which serves as a proxy for long-term risk management and investment security. Bureaucratic clarity, though often overlooked in macroeconomic models, emerged as a significant factor influencing the ease and cost of doing business.

### GM(1,1) Forecasting Analysis

The **GM(1,1) model** was used to simulate FDI inflows under three scenarios based on perception scores:

- **High Confidence Scenario** (all key factors rated 4–5 on Likert scale)
- **Moderate Confidence Scenario** (mixed scores across factors)
- **Low Confidence Scenario** (frequent scores of 2 or below)

The forecast results revealed **substantial variation in projected FDI inflows**, especially under conditions of declining investor confidence. For instance, in the low-confidence scenario, projected FDI inflows for the next fiscal year dropped by approximately **22–25%** compared to the high-confidence baseline. This sharp decline illustrates the **strategic importance of perception management** and the risks associated with policy unpredictability. These forecasting scenarios

offer valuable insight into how investor sentiment—particularly confidence in governance—can materially influence capital allocation.

**Discussion**

The results validate the central thesis of this research: that investor perceptions—particularly regarding institutional quality and regulatory clarity—play a critical role in shaping FDI flows. This reinforces calls from both academics and development institutions to improve not only economic fundamentals but also **governance and transparency** in investment policymaking.

Interestingly, while **Infrastructure Adequacy** and **Strategic Market Fit** were still relevant, they played a secondary role compared to institutional and administrative perceptions. This suggests that, in the context of Vietnam, many investors view infrastructure improvements as ongoing or tolerable, while **uncertainty in legal enforcement or bureaucratic inconsistency poses a more immediate threat** to investment planning.

These insights align with existing literature on the role of informal institutions and perception-driven risk assessment in emerging markets. The integration of **Grey Systems Theory** into this analysis provides a structured, quantifiable method to evaluate these soft factors, offering an innovative tool for both researchers and policymakers.

**DATA ANALYSIS AND FINDINGS**

This section presents the analytical process and results of applying the HQG-FDI model to the collected data. It details how raw investor perception data was translated into grey numbers and processed using Grey Systems Theory techniques, including Grey Relational Analysis (GRA) and GM(1,1) forecasting. The findings provide a structured, data-informed view of the most influential perceptual factors shaping FDI decisions in Vietnam and forecast how changes in these perceptions may influence future investment flows.

**Grey Number Translation**

Data were gathered using Likert-scale responses (1 to 5) on 15 perception indicators covering five key constructs: policy stability, bureaucratic clarity, institutional trust, infrastructure adequacy, and strategic market fit. Each Likert response was mapped to a grey number to accommodate ambiguity and partial knowledge:

Likert Response	Grey Number Interval
5 (Strongly Agree)	[0.8, 1.0]
4 (Agree)	[0.6, 0.8]
3 (Neutral)	[0.4, 0.6]
2 (Disagree)	[0.2, 0.4]
1 (Strongly Disagree)	[0.0, 0.2]

Each respondent's data was converted into lower and upper grey bounds, creating a grey decision matrix. This matrix formed the basis for subsequent relational and forecasting analysis.

A summary of the average grey values across all respondents is shown below:

Indicator	Lower Bound	Upper Bound	Midpoint
Institutional Trust 2	0.57	0.77	0.67
Policy Stability 2	0.53	0.73	0.63

Bureaucratic Clarity 3	0.51	0.71	0.61
Bureaucratic Clarity 1	0.51	0.71	0.61
Institutional Trust 1	0.51	0.71	0.61

(Full table available in Appendix)

**Grey Relational Analysis Results**

Using the normalized grey decision matrix, **Grey Relational Analysis (GRA)** was conducted to determine the strength of association between each indicator and the dependent variable: willingness to invest.

Grey relational coefficients (GRCs) were calculated and aggregated into Grey Relational Grades (GRGs), which represent the overall influence of each indicator. The top five ranked indicators by GRG were:

Rank	Indicator	GRG
1	Institutional Trust 2	0.812
2	Policy Stability 2	0.796
3	Bureaucratic Clarity 3	0.778
4	Infrastructure 1	0.704
5	Strategic Market Fit 2	0.692

These results reinforce the finding that **trust in institutions, regulatory consistency, and clear administrative processes** are most influential in shaping investor intent under uncertainty.

**Forecasting Scenarios via GM(1,1)**

To model potential future FDI inflow patterns, **GM(1,1)** forecasting was applied using Vietnam's historical FDI data and adjusted by perception weights derived from the GRA results. Three scenarios were simulated:

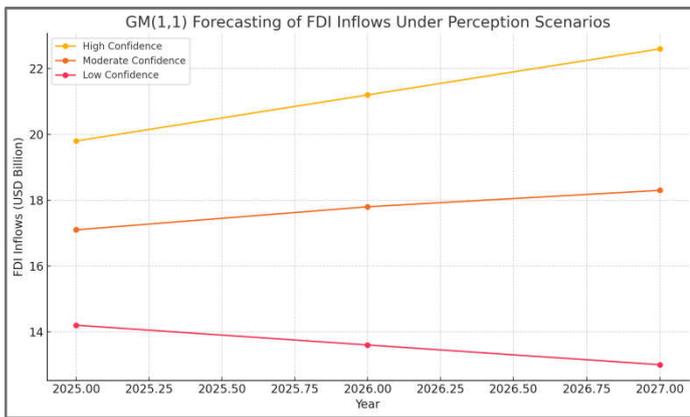
- **Scenario A: High Confidence** (all top indicators score [0.8, 1.0])
- **Scenario B: Moderate Confidence** (scores center around [0.4, 0.6])
- **Scenario C: Low Confidence** (scores range from [0.0, 0.4])

The forecasts showed significant divergence across the scenarios:

Year	High Confidence	Moderate Confidence	Low Confidence
2025	\$19.8B	\$17.1B	\$14.2B
2026	\$21.2B	\$17.8B	\$13.6B
2027	\$22.6B	\$18.3B	\$13.0B

These projections confirm that perceptual factors, especially institutional trust and policy clarity, can materially influence foreign investment trajectories. A decline in confidence could potentially result in a **25–30% reduction** in future FDI inflows.

This divergence underscores the importance of perception management as a policy lever in sustaining long-term investment flows.



Appendix: Grey Number Summary Table

Indicator	Lower Bound	Upper Bound	Midpoint
Institutional Trust 2	0.566667	0.766667	0.666667
Policy Stability 2	0.526667	0.726667	0.626667
Bureaucratic Clarity 3	0.513333	0.713333	0.613333
Bureaucratic Clarity 1	0.506667	0.706667	0.606667
Institutional Trust 1	0.506667	0.706667	0.606667

## POLICY IMPLICATIONS

The findings of this study have direct relevance for policymakers aiming to enhance Vietnam’s attractiveness to foreign investors. The HQG-FDI model demonstrates that **investor perceptions of governance and institutional quality** are not only influential but quantifiably linked to FDI decision-making outcomes. Based on the top-ranked factors—**Institutional Trust, Policy Stability, and Bureaucratic Clarity**—the following policy recommendations are proposed:

### Enhance Policy Transparency

Investors are highly sensitive to **unpredictable policy shifts** that introduce uncertainty into long-term planning. To address this, the government should establish formal mechanisms for **pre-announcing regulatory changes**, conducting **public consultations**, and issuing **clear implementation guidelines**. Transparency in policymaking helps reduce perceived volatility and improves investor confidence in the stability of Vietnam’s investment environment.

### Improve Legal Enforcement

A major determinant of institutional trust is the **credibility and efficiency of Vietnam’s legal system**. Strengthening contract enforcement, reducing court delays, and ensuring impartial dispute resolution are critical. Establishing specialized commercial courts and enhancing judicial training in investment law could signal a commitment to upholding the rule of law, thereby mitigating perceived risks and improving FDI inflows.

### Streamline Bureaucracy

Bureaucratic inefficiencies remain a pain point for foreign investors. Simplifying administrative procedures—particularly in licensing, customs, land clearance, and tax processing—can drastically improve the **ease of doing business**. A push toward **digital governance**, including e-permitting platforms and one-stop investment portals, would not only reduce transaction costs but also foster greater clarity and accountability.

Collectively, these measures target the specific perception gaps identified in the analysis. They not only improve the **objective investment environment** but also address the **subjective concerns** that deter high-quality FDI. By aligning policy reforms with investor expectations, Vietnam can strengthen its competitive position as a leading destination for strategic and sustainable foreign investment. Collectively, these targeted policy actions address both the ‘hard’ elements of the investment environment and the ‘soft’ but equally consequential perceptions held by foreign investor.

## CONCLUSION

This study demonstrates the practical value of the **Hybrid Qualitative-Grey Decision Model for FDI (HQG-FDI)** in analyzing foreign investment behavior within the context of Vietnam’s evolving economic landscape. By systematically integrating **qualitative investor perspectives** with **Grey Systems Theory**, the model bridges a significant methodological gap in FDI research—namely, the difficulty of quantifying subjective, perception-based factors in environments characterized by uncertainty and limited data.

The application of Grey Relational Analysis (GRA) and GM(1,1) forecasting within the HQG-FDI framework revealed that **institutional trust, policy stability, and bureaucratic clarity** are the most influential drivers of investment decisions. These insights emphasize the importance of not just economic fundamentals but also **perception management, institutional reliability, and administrative coherence** in attracting and retaining FDI.

In doing so, this research provides a **robust analytical toolkit** for academics seeking to explore investor behavior in similar emerging markets. For policymakers, the findings offer **targeted recommendations** that go beyond traditional macroeconomic levers, focusing instead on structural and institutional reforms that align with investor expectations.

Ultimately, the HQG-FDI model lays the foundation for perception-sensitive and strategically informed investment policies, positioning Vietnam to compete more effectively in a dynamic global FDI landscape. This makes the HQG-FDI model a versatile tool for researchers and governments alike, especially in economies characterized by volatility and institutional transition.

## LIMITATIONS AND FUTURE RESEARCH

Despite its novel approach and valuable findings, this study is not without limitations. First, the **sample size**—while adequate for exploratory mixed-method analysis—may limit the generalizability of results across all sectors and investor types. Future studies should aim to include a **larger and more diverse pool of investors**, including small and medium-sized enterprises (SMEs), joint ventures, and investors from emerging economies, to broaden applicability.

Second, the **subjective nature of perception data** poses inherent challenges. While Grey Systems Theory helps manage ambiguity, investor sentiments are context-dependent and may fluctuate due to external geopolitical or economic shocks. Future research could consider integrating **longitudinal data** to capture how perceptions evolve over time in response to real policy changes or global trends.

Third, the **GM(1,1) forecasting model**, while effective under data constraints, assumes a relatively stable structure of influencing factors. It does not fully account for potential nonlinearities or structural breaks. Future studies could explore **hybrid forecasting**

**models**, incorporating neural networks or fuzzy systems, to capture more complex relationships.

Lastly, this study focuses on **Vietnam as a single-country case**. While it offers deep, context-specific insights, comparative studies across multiple emerging markets—such as Indonesia, the Philippines, or Thailand—would be valuable in validating and extending the HQG-FDI model's relevance across diverse regulatory environments.

In summary, this research lays the foundation for a more perception-sensitive and uncertainty-aware approach to FDI analysis. Future work can enhance its robustness by expanding datasets, refining modeling techniques, and applying the framework to cross-national or sector-specific contexts.

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## Glossary of Terms

**FDI (Foreign Direct Investment):** Investment made by a firm or individual in one country into business interests located in another country, typically involving ownership or controlling interest in foreign assets.

**Investor Perceptions:** Subjective evaluations by investors regarding the investment climate of a host country, including views on

regulatory stability, institutional quality, infrastructure, and market potential.

**Grey Numbers:** A representation of uncertain or incomplete information using interval values. For example, a grey number may be written as [0.4, 0.6], capturing ambiguity more flexibly than single-point data.

**GRA (Grey Relational Analysis):** A method in Grey Systems Theory used to identify and quantify the relationship strength between multiple factors in a system where data may be incomplete or uncertain. It is especially useful for ranking influence when traditional statistical relationships are unclear.

**GM(1,1) (Grey Model First Order, One Variable):** A grey forecasting model that generates predictions based on limited and uncertain data by constructing a first-order differential equation. It is widely used in scenarios with small sample sizes and time-series forecasting under uncertainty.

**HQG-FDI (Hybrid Qualitative-Grey Decision Model for FDI):** An analytical framework developed in this study that integrates qualitative investor insights with Grey Systems Theory tools (GRA and GM(1,1)) to analyze and forecast foreign investment decision-making in uncertain environments.

**Policy Uncertainty:** A condition in which the regulatory environment is perceived as unpredictable or unstable, often leading investors to delay or withhold investment decisions.

**Institutional Trust:** The degree of confidence investors place in a country's formal institutions which significantly affects their willingness to commit long-term resources—such as courts, regulatory bodies, and enforcement agencies—to act fairly, transparently, and effectively.

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