

A Study of the Impact of the Legal Environment on the Logistics Market in Xishuangbanna Based on Perception Theory

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ABSTRACT

Against the background of the China–Laos Railway and the accelerated integration of Xishuangbanna into regional and international logistics corridors, the institutional and legal environment has become a critical factor influencing the development of the local logistics market. However, existing research has largely focused on infrastructure and cost factors, while relatively little is known about how logistics stakeholders' perceptions of the legal environment shape their evaluation of logistics market development. Guided by Perception Theory, this study investigates the effects of Legal Environment Stability, Legal Environment Fairness and Legal Environment Predictability on Logistics Market Development in Xishuangbanna, with Perceived Legal Environment specified as a mediating variable.

This study adopts a quantitative research method and collects data through a structured questionnaire survey administered to logistics related staff from relevant government departments, foreign trade enterprises and logistics or transport companies in Xishuangbanna. A total of 400 questionnaires were distributed, 352 were returned and 336 valid responses were retained for analysis. Reliability and validity of the scale were examined using internal consistency and construct validity indicators, correlation analysis was used to explore the relationships among the main variables, and structural equation modelling was applied to test the direct effects and the mediating effects of Perceived Legal Environment.

The results show that all proposed hypotheses H1 to H5c are supported, indicating that Legal Environment Stability, Legal Environment Fairness and Legal Environment Predictability significantly and positively influence Perceived Legal Environment, that Perceived Legal Environment significantly and positively influences Logistics Market Development, and that Perceived Legal Environment plays a significant mediating role in the relationships between the three legal environment dimensions and Logistics Market Development in Xishuangbanna. Practically, the findings suggest that policymakers and relevant authorities in Xishuangbanna should prioritize maintaining regulatory stability, ensuring impartial law enforcement, and providing clear legal guidelines to improve predictability. Implementing these measures will enhance stakeholders' positive perceptions of the legal environment, ultimately fostering the sustainable development and attractiveness of the local logistics market.

Keywords: perceived legal environment, legal environment stability, legal environment fairness, logistics market development.

Background of the Study

In the contemporary global economy, logistics systems are widely recognised as a core driver of trade competitiveness, regional integration and participation in global value chains. The World Bank's most recent Logistics Performance Index shows that countries with higher logistics performance scores tend to enjoy lower trade costs, more reliable supply chains and stronger integration into international markets. Recent empirical work further conceptualises logistics performance, environmental performance, sustainable development and institutional governance as interrelated determinants of national development outcomes (Karountzos et al., 2025). Studies on governance quality and logistics performance indicate that government effectiveness, regulatory quality and institutional policies have significant positive effects on international logistics activities and sectoral growth (Uyar et al., 2021; Wang et al., 2024). At the firm level, research on green logistics and infrastructure also shows that improvements in logistics systems can enhance service trade, company performance and environmental outcomes (Yingfei et al.). These findings underscore that logistics markets develop not only through physical infrastructure, but also through the broader institutional and policy environment in which they operate.

In the specific context of Xishuangbanna, the rapid expansion of rail based cross border logistics associated with the China–Laos Railway has heightened the importance of a legal environment that is perceived as stable, fair and predictable by logistics enterprises, foreign trade firms, transport companies, drivers and relevant government officials. While previous research has emphasised the macroeconomic benefits of the railway and the potential for reduced logistics costs and enhanced regional connectivity, there is limited empirical evidence on how stakeholders perceive the legal environment that governs logistics transactions in this border region and how such perceptions relate to the development of the logistics market. Existing studies on the quality of business legal environments largely adopt national level perspectives and do not capture subnational variations in perception within strategic corridors (Nogal-Meger, 2018).

The present study therefore proposes a conceptual framework that links three specific dimensions of the legal environment, namely legal environment stability, legal environment fairness and legal environment predictability, to logistics market development through the mediating variable of perceived legal environment. By grounding the analysis in Perception Theory, the study aims to elucidate how external legal structures are interpreted by logistics actors in Xishuangbanna, how these interpretations form a global perception of the legal environment and how this perception shapes assessments of logistics market development. In doing so, the research seeks to contribute to the literature on logistics markets, law and development and institutional perception by providing subnational, perception based evidence from a key node of the China–Laos Railway corridor.

Objective of the study

1. To examine the effect of Legal Environment Stability on the Perceived Legal Environment in Xishuangbanna.
2. To examine the effect of Legal Environment Fairness on the Perceived Legal Environment in Xishuangbanna.
3. To examine the effect of Legal Environment Predictability on the Perceived Legal Environment in Xishuangbanna.

4. To examine the effect of the Perceived Legal Environment on Logistics Market Development in Xishuangbanna.

5. To explore the mediating role of the Perceived Legal Environment in the relationship between Legal Environment Stability, Legal Environment Fairness, Legal Environment Predictability and Logistics Market Development in Xishuangbanna.

Scope of the study

This study focuses on the relationship between the legal environment and logistics market development in Xishuangbanna Dai Autonomous Prefecture, Yunnan Province, in the context of the China–Laos Railway and related cross border logistics activities. The research concerns logistics activities that are directly or closely connected to cross border trade and transport in Xishuangbanna.

Conceptually, the study covers four main variables. The independent variables are Legal Environment Stability, Legal Environment Fairness and Legal Environment Predictability. The mediating variable is the Perceived Legal Environment, defined as the overall perception of the legal environment held by logistics stakeholders. The dependent variable is Logistics Market Development in Xishuangbanna, which refers to the perceived level of development, attractiveness and institutional quality of the local logistics market. The study does not attempt to include all possible determinants of logistics market development, but focuses specifically on the legal environment and its perception.

Using a quantitative research method, data are collected through a structured questionnaire administered to relevant staff members who are directly engaged in logistics related work in Xishuangbanna. These respondents include staff from key government departments involved in cross border logistics management (such as commerce, foreign trade and customs related offices), as well as staff from foreign trade enterprises and logistics or transport companies that participate in cross border or long-distance logistics activities. They are selected because they are directly exposed to the legal environment and have practical experience of the local logistics market.

Research Methodology

The present study adopts a quantitative research design in order to test the hypothesised relationships among Legal Environment Stability, Legal Environment Fairness, Legal Environment Predictability, Perceived Legal Environment and Logistics Market Development in Xishuangbanna. The study uses a questionnaire to collect primary data from relevant staff members who are directly engaged in logistics related work, including staff from core government departments responsible for cross border logistics management as well as staff from foreign trade enterprises and logistics or transport companies operating in Xishuangbanna. Using Likert type scale that capture respondents' perceptions of the stability, fairness and predictability of the legal environment, their overall perceived legal environment and their evaluation of logistics market development. Using reliability and validity testing, correlation analysis and structural equation modelling or regression based mediation analysis, in order to assess the fit of the proposed conceptual framework and to provide support for the research objectives and hypotheses.

Hypotheses

H1: Legal Environment Stability has a positive effect on the Perceived Legal Environment.

H2: Legal Environment Fairness has a positive effect on the Perceived Legal Environment.

H3: Legal Environment Predictability has a positive effect on the Perceived Legal Environment.

H4: The Perceived Legal Environment has a positive effect on Logistics Market Development.

H5a: The Perceived Legal Environment mediates the relationship between Legal Environment Stability and Logistics Market Development.

H5b: The Perceived Legal Environment mediates the relationship between Legal Environment Fairness and Logistics Market Development.

H5c: The Perceived Legal Environment mediates the relationship between Legal Environment Predictability and Logistics Market Development.

Theoretical framework

The conceptual framework of this study is grounded in Perception Theory and posits that the legal environment influences logistics market development in Xishuangbanna through stakeholders' subjective perceptions. Accordingly, the framework proposes that Legal Environment Stability, Legal Environment Fairness and Legal Environment Predictability each exert positive effects on the Perceived Legal Environment, that the Perceived Legal Environment has a positive effect on Logistics Market Development and that the Perceived Legal Environment mediate the relationships between the three legal environment dimensions and Logistics Market Development.

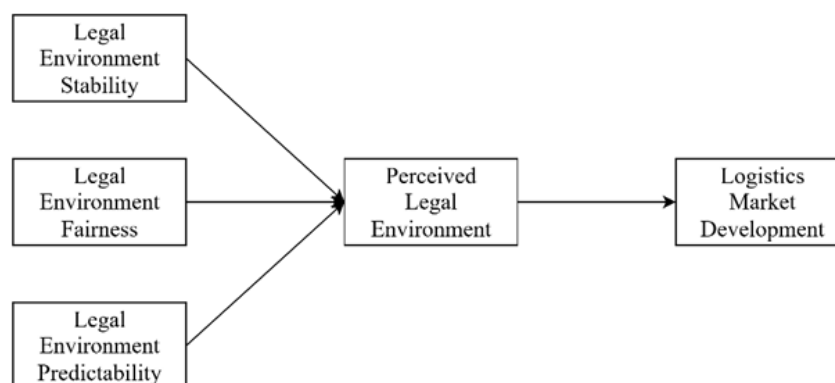


Figure 1 Conceptual Framework

Finding and Conclusion

Reliability Analysis

The reliability and validity analysis shows that the measurement scale used in this study has good internal consistency and is suitable for factor analysis.

Table 1 Reliability Analysis Result

Variable	Number of items	Cronbach's alpha
Legal Environment Stability	4	0.87
Legal Environment Fairness	4	0.89
Legal Environment Predictability	4	0.88
Perceived Legal Environment	4	0.90
Logistics Market Development	4	0.91

As reported in Table 1, the Cronbach's alpha coefficients for all five variables are above the commonly accepted threshold of 0.70, with values ranging from 0.87 for Legal Environment Stability to 0.91 for Logistics Market Development, indicating high internal consistency among the items within each variable.

Validity Analysis

Table 2 KMO and Bartlett's Test^a

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.92
Bartlett's Test of Sphericity	Approx. Chi-Square	2150.37
	Df	190
	Sig.	0.000

The overall Kaiser Meyer Olkin (KMO) measure of sampling adequacy is 0.92, which is considered excellent and suggests that the correlations among items are sufficiently large for factor analysis.

Demographic Characteristics of Respondents

The demographic characteristics of the respondents indicate that the sample is composed of experienced logistics related staff from both government and enterprise sectors in Xishuangbanna. Among the 336 valid respondents, 58 percent are male and 42 percent are female. In terms of age, 12 percent are 25 years or younger, 38 percent are between 26 and 35 years old, 32 percent are between 36 and 45 years old and 18 percent are 46 years old or above, which shows that the majority of respondents are in the middle stages of their careers. Regarding educational background, 6 percent hold a diploma or lower qualification, 64 percent hold a bachelor's degree and 30 percent hold a master's degree or above, indicating that most respondents have at least undergraduate level education.

With respect to organisational affiliation, 34 percent of respondents work in government departments related to commerce, foreign trade or customs, 31 percent are employed in foreign trade enterprises and 35 percent work in logistics or transport companies. In terms of work experience in logistics related positions, 19 percent have worked for 3 years or less, 37 percent for 4 to 7 years, 24 percent for 8 to 11 years and 20 percent for 12 years or more. As for job position, 62 percent identify as general staff, 23 percent as supervisors and 15 percent as managers or higher level executives. Overall, these characteristics

suggest that the sample is reasonably diverse and includes respondents who are familiar with logistics operations and with the legal environment affecting the logistics market in Xishuangbanna.

Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships among the five main variables, namely Legal Environment Stability, Legal Environment Fairness, Legal Environment Predictability, Perceived Legal Environment and Logistics Market Development.

Table 3 Correlations Analysis Result

Variable	LES	LEF	LEP	PLE	LMD
LES	1.00				
LEF	0.58**	1.00			
LEP	0.55**	0.57**	1.00		
PLE	0.60**	0.65**	0.63**	1.00	
LMD	0.50**	0.54**	0.52**	0.70**	1.00
Mean	3.78	3.72	3.69	3.82	3.76
SD	0.68	0.71	0.70	0.66	0.69

Note: $p < 0.01$.

Structural Equation Modelling Analysis

Structural equation modelling was employed to examine the direct relationships among Legal Environment Stability, Legal Environment Fairness, Legal Environment Predictability, Perceived Legal Environment and Logistics Market Development.

Table 4 Fit Indices

Index	Value
χ^2	274.62
df	146
χ^2/df	1.88
CFI	0.95
TLI	0.94
GFI	0.92
RMSEA	0.052
SRMR	0.046

The overall fit of the structural model was first evaluated. The chi square statistic was $\chi^2(146) = 274.62$, with a χ^2/df ratio of 1.88, which is below the recommended upper limit of 3. The incremental fit

indices CFI and TLI were 0.95 and 0.94 respectively, and the absolute fit index GFI was 0.92, all exceeding the conventional cut off value of 0.90. In addition, the error indices indicated acceptable fit, with RMSEA equal to 0.052 and SRMR equal to 0.046, both lower than the recommended threshold of 0.08. These results suggest that the structural model fits the data well and is appropriate for testing the hypothesised direct effects.

Table 5 Direct Effects

Hypothesis	Path	β	p value	Result
H1	LES $\rightarrow$ PLE	0.21	0.003	Supported
H2	LEF $\rightarrow$ PLE	0.36	< 0.001	Supported
H3	LEP $\rightarrow$ PLE	0.29	< 0.001	Supported
H4	PLE $\rightarrow$ LMD	0.68	< 0.001	Supported

The path estimates show that all three dimensions of the legal environment have positive and statistically significant effects on Perceived Legal Environment. Legal Environment Stability has a significant positive effect on Perceived Legal Environment ($\beta = 0.21$, $p < 0.01$), Legal Environment Fairness has a stronger positive effect on the Perceived Legal Environment ($\beta = 0.36$, $p < 0.001$) and Legal Environment Predictability also exerts a significant positive effect ($\beta = 0.29$, $p < 0.001$). These findings support Hypotheses H1, H2 and H3, indicating that greater stability, fairness and predictability in the legal environment are associated with a more favourable overall perception of the legal environment among logistics related staff. In addition, Perceived Legal Environment has a strong and significant positive effect on Logistics Market Development ($\beta = 0.68$, $p < 0.001$), which supports Hypothesis H4 and suggests that a more positive Perceived Legal Environment is linked to higher perceived levels of logistics market development in Xishuangbanna. The model explains approximately 67 percent of the variance in Perceived Legal Environment and 46 percent of the variance in Logistics Market Development, indicating substantial explanatory power.

Mediation Analysis

The mediating role of Perceived Legal Environment in the relationships between the three legal environment dimensions and Logistics Market Development was tested separately using a bootstrapping procedure with 5 000 resamples. Indirect effects and their 95 percent confidence intervals were estimated to determine whether the mediation effects were statistically significant. As shown in Table 4.8, the indirect effect of Legal Environment Stability on Logistics Market Development through Perceived Legal Environment is positive and significant ($\beta = 0.14$, $p < 0.01$), and the 95 percent confidence interval does not include zero, supporting Hypothesis H5a. This indicates that a more stable legal environment enhances Logistics Market Development primarily by improving stakeholders' overall Perceived Legal Environment. Similarly, the indirect effect of Legal Environment Fairness on Logistics Market Development via Perceived Legal Environment is positive and significant ($\beta = 0.24$, $p < 0.001$), supporting Hypothesis H5b. This suggests that when the legal environment is perceived as fair and impartial, it strengthens the Perceived Legal Environment,

which in turn promotes perceptions of logistics market development. The indirect effect of Legal Environment Predictability on Logistics Market Development through Perceived Legal Environment is also positive and significant ($\beta = 0.20$, $p < 0.001$), supporting Hypothesis H5c.

Table 6 Mediation Effects Result

Hypothesis	Indirect path	Indirect β	95% CI (lower, upper)	p value	Mediation type
H5a	LES $\rightarrow$ PLE $\rightarrow$ LMD	0.14	0.05, 0.24	0.004	Significant
H5b	LEF $\rightarrow$ PLE $\rightarrow$ LMD	0.24	0.14, 0.35	< 0.001	Significant
H5c	LEP $\rightarrow$ PLE $\rightarrow$ LMD	0.20	0.11, 0.31	< 0.001	Significant

Heretical and Empirical Contributions

Beyond the specific context of Xishuangbanna, this study makes significant theoretical and empirical contributions to the literature on law, logistics, and institutional governance. Theoretically, this research extends Perception Theory into the domain of legal institutional environments and logistics markets. While existing studies on the quality of legal environments and logistics performance have largely relied on macro level, objective national indices, this study addresses a critical gap by focusing on the micro-level, subjective perceptions of frontline stakeholders in a subnational logistics market.

By treating the legal environment specifically its stability, fairness, and predictability as a perceived variable rather than merely an objective set of rules, the study demonstrates that stakeholders' cognitive appraisals serve as a crucial psychological mechanism linking formal legal structures to actual market development outcomes. Empirically, this research proves that macro-level connectivity and institutional policies only translate into regional market development when they are positively perceived by the actors operating on the ground.

Consequently, the academic significance of this study extends well beyond the China-Laos Railway corridor. It refines the conceptualisation of logistics market development as a perception-based outcome, providing a robust and transferable analytical framework. This framework can be broadly applied to future studies investigating the intersection of law, logistics, and regional economic development in other cross-border regions, international transport corridors, and emerging logistics hubs globally.

Recommendations

Relevant authorities in Xishuangbanna should prioritise maintaining continuity and stability in logistics related laws, regulations and policy measures, avoiding frequent abrupt changes and ensuring that any necessary amendments are gradual and well communicated. This can help strengthen Legal Environment Stability and, through Perceived Legal Environment, support more positive perceptions of Logistics Market Development.

Law enforcement and regulatory agencies involved in logistics supervision (such as commerce, foreign trade, customs and transport authorities) should focus on improving fair, impartial and non-discriminatory enforcement, ensuring that similar cases are handled in similar ways and that different types of logistics market participants receive equal treatment. Enhancing Legal Environment Fairness is likely to

significantly improve Perceived Legal Environment and thereby promote a more favourable view of the logistics market.

To increase Legal Environment Predictability, authorities should provide clear guidelines, explanatory documents and regular training or information sessions for logistics enterprises and practitioners so that stakeholders can reasonably anticipate how laws and regulations will be interpreted and enforced. Strengthening transparency in regulatory processes and publicising stable enforcement standards will help reduce perceived uncertainty and improve Perceived Legal Environment.

It is recommended to establish or reinforce regular consultation and feedback mechanisms between government departments and logistics market participants, such as joint meetings, consultation platforms or hotlines. By systematically collecting and responding to stakeholders' perceptions of stability, fairness and predictability, authorities can monitor changes in Perceived Legal Environment in a timely manner and adjust institutional arrangements to better support Logistics Market Development in Xishuangbanna.

Limitations of the Study While this study provides valuable insights, it has several limitations that should be acknowledged. First, the cross-sectional research design limits the ability to draw definitive causal inferences regarding how changes in the legal environment affect logistics market development over the long term. Second, the study focuses exclusively on Xishuangbanna, meaning the findings reflect specific cross-border institutional dynamics and may not be fully generalizable to other logistics hubs. Third, the use of purposive and convenience sampling may introduce certain sampling biases. Lastly, guided by Perception Theory, the study relies on self-reported survey data to measure the perceived legal environment, which captures essential subjective evaluations but may be subject to individual cognitive variations.

Suggestions for Future Research Based on the findings and limitations of this study, several avenues for future academic research are suggested. **Inclusion of Additional Variables:** Future models could be expanded by incorporating additional institutional or market variables, such as perceived infrastructure quality, market competition intensity, or the digitalisation of logistics services. **Longitudinal Studies:** To overcome the limitations of a cross-sectional design, future research should conduct longitudinal studies to track how ongoing changes in the legal environment and its perception dynamically affect Logistics Market Development over time. **Comparative Regional Research:** Researchers are encouraged to conduct comparative studies between Xishuangbanna and other border regions to provide more comprehensive evidence for policymaking and regional logistics planning. **Mixed-Methods Approach:** Future studies could benefit from combining quantitative surveys with qualitative in-depth interviews to provide deeper explanations of how specific legal enforcement practices shape stakeholders' perceptions of fairness and predictability.

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