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Research on the Impact of Taobao Shipping Insurance on the Store Level and Service Guarantee Score of Small and Medium-sized Clothing Stores

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Abstract. With the development of the Internet, online consumer behavior has exhibited a trend of increasing frequency. Taobao, as a mainstream online shopping platform hosting many apparel stores, accounts for 65% of small and medium-sized stores with follower bases ranging from 10,000 to 50,000. However, academic research focusing on such stores remains scarce. This study investigates the impact of Taobao shipping insurance on the dynamic rating and Service Guarantee Score of small and medium-sized clothing stores, while exploring the mediating role of consumer sentiment in the relationship between shipping insurance and store levels. Given the lack of brand endorsement and market foundation among these stores, the cost-effectiveness of shipping insurance under a high return rate remains contentious. Based on publicly available Taobao data, this research employs linear regression models and controlled experiments, controlling for covariates such as follower count and customer service respond time. The findings indicate that shipping insurance has a small impact on store level and Service Guarantee Scores.

Keywords: online shopping, shipping insurance, store level, service guarantee score

1. Introduction

Taobao shipping insurance, provided by third-party insurers, covers one-way logistics costs for consumers under the “seven-day no-reason return” policy. Taobao Service Guarantee Score evaluates store service quality by combining multi-dimensional customer service data. Apparel, as a core category within the Taobao ecosystem, contributes over 30% of Taobao's Gross Merchandise Volume (GMV). The prevalence of small and medium-sized merchants, constituting approximately 65% of stores, contrasts with the scarcity of academic research on the effect of shipping insurance on such entities [1]. Due to the lack of comparative pre-and post-policy implementation data following the 2010 introduction of shipping insurance, the application of methodologies such as difference-in-differences models and endogenous risk assessments face limitations. This study examines the relationship between shipping insurance and store level or Service Guarantee Score, and explores the mediating effect of consumer sentiment between shipping insurance and store level. By controlling for variables such as follower base and employing regression analysis and

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questionnaire surveys, it provides small- and medium-sized merchants with a revenue evaluation framework and operational strategies.

2. Linear regression analysis: Relationship between shipping insurance and store level and service guarantee score

2.1 Data source and variable definitions

The study obtains monthly panel data of major small and medium-sized women's apparel stores from Taobao open API. The selection criteria included a follower range of 10,000-50,000 followers and homogeneity in customer service response time. The covariates for the sample of stores are detailed in Table 1.

Table 1: Introduction to overall variables

Types of variables	Variable Name	Source of data
Dependent variable	Store level (blue crown/gold crown/star) service guarantee score	Store Homepage
Independent variable	Freight Insurance Activation（0/1）	Store Homepage
Control variable	Customer service response time(seconds) Number of fans (10000-50000)	Store Homepage

2.2 Model analysis

Store level and service guarantee score are representative indicators of sales performance, playing a decisive role in Taobao stores research [2]. To ensure data accuracy, this study excludes zero monthly sales for three consecutive months and samples of follower count fluctuations exceeding ± 10%, and finally screens out 327 valid store samples from tens of thousands of stores.

Model 1: The effect of shipping insurance on service guarantee score

Model 2: The effect of shipping insurance on store level

Model 3: Extended analysis of shipping insurance's effect on hierarchical markers of store levels (e.g,"Crown","Diamond") under equivalent total level condition. This model employs hierarchical markers as the dependent variable while controlling for fixed effects of total levels, isolating the independent influence of shipping insurance on segmented metrics.

Linear regression analyses are conducted separately for the two dependent variables to examine indicator variations across different shipping insurance status, with further predictions on the relationship between shipping insurance and hierarchical markers of store levels.

Linear regression equation:

$$\ln(\text{store level}) = \beta_0 + \beta_1(\textit{shipping insuarnce}) + \beta_2(\text{Customer service respond time}) + \mu_i + \epsilon \quad (1)$$

$$\ln(\text{service guarantee score}) = \beta_0 + \beta_1(\textit{shipping insuarnce}) + \beta_2(\text{Customer service respond time}) + \mu_i + \epsilon$$

$$\ln(\textit{hierarchical markers}) = \beta_0 + \beta_1(\textit{shipping insuarnce}) + \beta_2(\text{Customer service respond time}) + \mu_i + \epsilon$$

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2.3 Model run analysis

To deeply investigate the impacts of shipping insurance on service guarantee score and store level, this study designs multidimensional analysis tables based on linear regression results. By integrating analytical templates and expected values, the data outcomes are systematically interpreted.

2.3.1 Influence of shipping insurance on service guarantee score

This study will initially understand the overall fit of Model 1 through Tables 2-3, analyze the extent of the model's interpretation of the data, and lay the foundation for the subsequent detailed analysis of the impact of shipping insurance on service guarantee score.

Table 2: ANOVA[a] of service guarantee score

Model	Squared sum	Degree of freedom	Mean square	F	Statistical Significance
Regression	.001	1	.001	.022	.881[b]
Residual	12.023	236	.051		
Sum	12.024	237			

Table 3: Coefficients on service guarantee score

Model	Standard coefficient Beta	t-value	Statistical Significance	lower bound of the confidence interval	upper bound of the confidence interval
Constant		195.459	<.001	4.682	4.778
Shipping insurance	.010	.150	.881	-.055	.064

a. Dependent variable b. Independent variable

Regression analysis shows that the R-squared value tends to be close to 0, indicating that the goodness-of-fit of the regression equation is low and its explanatory power is poor. The F-value is about 0.022, which is much smaller than the critical value of 3.86, suggesting that the regression equation has a weak influence on the dependent variable. The statistical significance is 0.881 is greater than the significance threshold of 0.05. Moreover, the absolute value of the t-value for shipping insurance is 0.15, less than 1.96, and its significance is greater than 0.05. This indicates that when the status of shipping insurance changes, there is no significant difference in the store's service guarantee score. In other words, shipping insurance has a minor impact on the store's customer service guarantee score, with a low correlation.

2.3.2 Influence of shipping insurance on store level

To explore the impact of shipping insurance on store level, this study constructs a table based on the linear analysis results of Model 2, and comprehensively utilizes the analysis template and expected values to deeply analyze and interpret the data results, as shown in Tables 4-5.

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Table 4: Store level in ANOVA[a]

Model	Squared sum	Degree of freedom	Mean square	F	Statistical Significance
Regression	1.272	1	1.272	1.443	.231[b]
Residual	208.006	236	.881		
Sum	209.277	237			

Table 5: Coefficients on store level

Model	Standard coefficient Beta	t	Statistical Significance	lower bound of the confidence interval	upper bound of the confidence interval
Constant		22.497	<.001	2.066	2.463
Shipping insurance	-.078	-1.201	.231	-.401	.097

The regression results reveal suboptimal model fit, with an R^2 value (0.006) significantly below 1, indicating insufficient explanatory power. The F-value of 1.443 is less than 3.86, which further corroborates the weak association between shipping insurance and hierarchical markers. Meanwhile, the significance is greater than 0.05, which means that the store level does not show a significant difference when the shipping insurance status changes. In addition, the standardized coefficient for shipping insurance β is -0.078, and the absolute value of the t-value is 1.201, which is smaller than the test critical value of 1.96, and its significance is greater than 0.05, which further confirms that from the perspective of coefficients and statistical tests, the operation of shipping insurance has a relatively weak influence on the store level.

2.3.3 Influence of shipping insurance on hierarchical markers

In order to explore the effect of shipping insurance on hierarchical markers, this study creates a table based on the linear regression results of Model 3, combines the analysis template and critical values, and analyzes the data results in depth, as shown in Tables 6-7.

Table 6: Hierarchical markers of store levels in ANOVA[a]

Model	Square sum	Degree of freedom	Mean square	F	Statistical Significance
Regression	.187	1	.187	.131	.717[b]
Residual	336.362	236	1.425		
Sum	336.549	237			

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Table 7: Coefficients on the hierarchical markers of store level

Model	Standard coefficient Beta	t	Statistical Significance	lower bound of the confidence interval	upper bound of the confidence interval
Constant		30.129	<.001	3.604	4.108
Shipping insurance	.024	.362	.717	-.258	.375

From the results of regression analysis, the R^2 value tends to be close to 0, indicating that the fit of this regression equation and the explanation of shipping insurance for hierarchical markers is poor. The F value is less than 3.86, indicating that the overall influence of the regression equation is limited; at the same time, the significance is greater than 0.05, which indicates that there is no significant difference in the number of markers for different store levels when the status of the shipping insurance changes. In addition, the absolute value of t is 0.362, which is smaller than 1.96, and the significance is greater than 0.05, which further proves that the use of shipping insurance has little influence on the hierarchical markings.

In summary, the comprehensive regression analysis across three critical aspects——service guarantee score, store level, and hierarchical markers of store level—— reveals consistently weak model performances. Experimental measures such as R^2 value, F value and significance all deviate from the correct range that can prove the relationship between the status of shipping insurance and the store service guarantee score, store level, and hierarchical markers of store level, which refutes the hypothesis that shipping insurance has a significant effect on them.

3. Mediated effects of consumer emotion: Experimental analysis of shipping insurance's impact on store metrics

Customer emotion acts as a mediator variable potentially linking shipping insurance status to purchase intention, thereby influencing store service guarantee score and store level [3-4]. This study employed Credamo-platform questionnaires, simulating authentic Taobao shopping scenarios. While controlling variables (apparel price, follower count, store level, customer service response time), only shipping insurance status was manipulated. Among 180 questionnaires distributed to recent Taobao apparel consumers, 31 invalid responses were excluded, yielding 149 valid samples (83% validity rate). Subsequently, participants were randomized into experimental (with shipping insurance) and control groups (without shipping insurance). Two emotion dimensions were measured via 5-point Likert scale: store trust ("How much do you trust the store?") and repurchase intention ("How likely are you to repurchase from this store?"). Prior to analysis, reliability tests and t-test ensured measurement stability and validity of emotional constructs[5-6].

3.1 Reliability analysis: Testing the significance of mediating effects

Before testing the significance of the mediation effect, reliability analysis is a key pre-step to ensure the quality and reliability of data. In the following, the reliability analysis will be carried out on the survey data of no shipping insurance, and the reliability of the data will be assessed by considering key indicators such as Alpha coefficient, KMO value, so as to lay the foundation for the accuracy of the subsequent mediation effect test, as shown in Tables 8-9.

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3.1.1 Analysis of no shipping insurance survey data

Table 8: KMO and Bartlett's test of sphericity 1

KMO Sample Suitability Quantity	.782
Approximate chi square	120.348
Degree of freedom	10
Statistical Significance	<.001

Analyzing the above two tables, Cronbach's Alpha value (0.784), and the KMO measure (0.782) both fell in the acceptable range of 0.7-0.8, indicating a strong and close relationship between the variables, better reliability and robust validity of the data. Bartlett's test further confirmed the suitability of the data for analysis.

3.1.2 Analysis of shipping insurance survey data

Table 9: KMO and Bartlett's test of sphericity 2

KMO Sample Suitability Quantity	.733
Approximate chi square	77.158
Degree of freedom	10
Statistical Significance	<.001

Analyzing the results of above tables, the Alpha value (0.725) and the KMO value (0.733) both fell in the acceptable range of 0.7 -0.8, indicating that there is a strong relationship between the variables and that the data has an excellent reliability and validity when the questionnaire survey with shipping insurance is analyzed for trustworthiness.

In summary, combining the results of the reliability analysis in the two states of no shipping insurance and with shipping insurance, the data reliability performance is good. This reflects the significant mediation path of consumer sentiment in the mediation between shipping insurance and store rank and rating under the change of shipping insurance status, and the mediation effect of consumer sentiment is confirmed.

3.2 t-Test: Verifying the differences in key variables such as customer trust and store level across shipping insurance statuses

After confirming the mediating effect of consumer sentiment, in order to further explore the specific impact of shipping insurance status on key variables, this part utilizes the t-test to deeply investigate the differences in key variables such as customer trust and service guarantee scores under different shipping insurance statuses, providing empirical evidence and theoretical references for the subsequent research, as shown in Table 10.

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Table 10: Group statistics

Evaluative dimension	No shipping insurance(n=76)	With shipping insurance(n=73)	Welch's t test	P value	Mean difference	Cohen's d
	M(SD)	M(SD)	T(df)		Mean difference[95%Cl]	
Degree of trust of the store	0.96(0.79)	1.85(0.40)	-8.72 (111.52)	<.001	-0.89[-1.09,-0.69]	1.42
Service guarantee score	3.51(0.81)	4.29(0.59)	-6.71 (137.16)	<.001	-0.78[-1.01,-0.55]	1.08
After-sales protection level	1.61(1.02)	3.27(0.63)	-12.06 (125.61)	<.001	-1.67[-1.94,-1.40]	1.96

M: mean SD: Standard deviation

Graphical analysis confirmed significant effects of shipping insurance status on customer trust, service guarantee score, and after-sale guarantee level prediction(all p value <0.05; Cohen's d-value =1.95 (>0.8),with higher means in the experimental group(with shipping insurance) versus control(trust:1.85 vs 0.96; service guarantee score:4.29 vs 3.51; after-sales: 3.27 vs 1.61).

In summary, customer trust plays a significant mediating role in the link between shipping insurance and store guarantee score after controlling for follower count and customer service response time.

3.3 Data input for mediation effect analysis

The study employs a randomized controlled trial to simulate an authentic e-commerce scenario, examining the mediating role of consumer trust in the relationship between shipping insurance activation and service guarantee score. Key controlling variables include store follower count (about 10,000 to 50,000) and customer service response time (nearly 21 seconds). Applying Hayes' PROCESS macro Model 4, combined with Bootstrap to verify the mediation path of "shipping insurance→trust→protection score". In the model, the dependent variable Y is the service guarantee score, the independent variable X is the shipping insurance status, and the mediating variable M is the degree of customer trust, and the sample size of the analysis is 149. The following is the analysis of the mediation of customer trust in the mediation relationship between shipping insurance and service guarantee score, as shown in Table 11.

Table 11: Analysis of the mediating effect of customer trust

Task	Efficiency value	SE value	Coefficient significance t	Coefficient significance P	95%CI Upper limit	95%CI lower limit	Efficiency ratio
Direct effect	-0.2768	0.1559	4.430	0.00	-0.531	0.085	34.9%
Indirect effect	0.275	0.064	3.396	0.00	0.229	0.869	65.1%
Overall effect	0.4226	0.077	6.805	0.00	0.371	0.676	100%

Analyzing the table, p value is less than 0.001, the value of the indirect effect is 0.275 and Bootstrap's 95% confidence interval does not include 0, indicating that customer trust is a significant

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and effective mediator between shipping insurance and store level, and that the indirect effect accounts for 65.1% of the overall effect, suggesting that shipping insurance improves store level primarily by enhancing customer trust. In addition, the direct effect of shipping insurance on store level is -0.2768<0.154, which did not reach the significance level, and given the limited data, it is confirmed that trust is the fully mediating variable.

4. Conclusion

This study investigates the dual impact of Taobao shipping insurance on store levels and customer service guarantee scores among small and medium-sized apparel stores, with a focus on the mediating role of consumer emotion. Empirical results reveal limited direct effects of shipping insurance on service guarantee scores, but demonstrate significant customer trust enhancement (mediating effect: 65.1%). Cost-benefit analyses indicate disproportionate financial burdens for SMEs(Small and medium-sized enterprises) of 10000 to 50000 followers in high cost-rate scenarios (e.g, remote areas or low-price products). Strategic alternatives are recommended: SMEs could optimize evaluations through targeted coupon incentives and enhanced after-sales service. Platforms should provide rate subsidies based on product return-rate thresholds or implement data transparency initiatives--sharing anonymized shipping insurance claims via collaborative dashboards to refine risk models. Limited include cross-sectional data constraints preventing long-term effect tracking. Future research should conduct cross-platform comparisons(e.g: JD.com and Pinduoduo) to advance omnichannel risk management theories.

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