

Empirical Study of Cross-Border E-commerce Brand Formation

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[Abstract]

Cross-border e-commerce has emerged as a crucial force in stabilizing China's foreign trade, driving the transformation and upgrade of China's foreign trade, and contributing to global economic development and stability. As a result, promoting the high-quality development of cross-border e-commerce has become a common challenge within the Chinese industry. However, with the rapid growth of cross-border e-commerce, it faces new phenomena and challenges, such as a mix of quality, fierce competition, and price competition. Brands serve as distinguishing markers for identifying entities, and brand building is a prudent choice for achieving high-quality development in cross-border e-commerce. This article utilizes brand theory, employing a combined qualitative and quantitative approach, with a specific focus on key elements within the operations of cross-border e-commerce enterprises. Through an analysis of the key elements influencing the formation and development of brands within the internal operations of Chinese cross-border e-commerce enterprises, it investigates their internal formation mechanisms and assesses the significance of these critical factors in influencing brand formation. The research process is based on data from overseas consumers, conducting empirical analysis, ultimately providing certain guidance for brand development in cross-border e-commerce enterprises.

▶ **Key words:** Cross-border e-commerce, Brand, Formation Mechanism, Empirical Analysis

[요 약]

국경 간 전자상거래는 중국의 대외무역을 안정시키고, 중국 대외무역의 전환과 업그레이드를 추동하며, 글로벌 경제 발전과 안정에 기여하는 결정적인 힘으로 부상했다. 이에 따라 국경 간 전자상거래의 고품질 발전을 추동하는 것은 중국 업계 내에서 공동의 난제로 되었습니다. 그러나 국경 간 전자상거래가 빠르게 성장하면서 품질 혼재, 치열한 경쟁, 가격 경쟁 등 새로운 현상과 도전에 직면해 있다. 브랜드는 주체를 식별하는 구별표지 역할을 하며 브랜드 구축은 국경 간 전자상거래에서 고품질 발전을 이룩하는 신중한 선택이다. 이 글은 정성적 접근법과 정량적 접근법이 결합된 브랜드 이론을 활용하며, 국경 간 전자상거래 기업 운영 내의 주요 요소에 구체적으로 초점을 맞춘다. 중국 국경 간 전자상거래 기업의 내부 운영 내에서 브랜드의 형성과 발전에 영향을 미치는 핵심 요소들에 대한 분석을 통해 그들의 내부 형성 메커니즘을 조사하고 브랜드 형성에 영향을 미치는 이들 중요 요소들의 중요성을 평가한다. 연구과정은 해외 소비자의 데이터를 바탕으로 실증분석을 실시하여 궁극적으로 국경 간 전자상거래 기업의 브랜드 개발을 위한 일정한 지침을 제공하고 있다.

▶ **주제어:** 국경을 초월 한 전자상거래, 브랜드, 형성 메커니즘, 실증적 분석

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I. Introduction

1.1 Research Background

Currently, China's cross-border e-commerce has become a significant force in stabilizing foreign trade and a new driver for the transformation and upgrading of foreign trade. Digital technologies represented by artificial intelligence, big data, and cloud computing continuously permeate various aspects of cross-border e-commerce, serving as essential drivers for innovation in business models and cost reduction, thereby ushering in new development opportunities for cross-border e-commerce. At present, brand building and development, primarily focusing on the Direct to Consumer (DTC) model that directly reaches consumers, have gradually become a hot topic in cross-border e-commerce. Companies are increasingly embarking on the path of branding, and strong capabilities in product production, supply, fine-tuned operations, and brand image shaping have become key factors for cross-border e-commerce companies to break free from homogenized competition.

In the past, scholars like Aaker and Keller introduced the concept of brand assets and related theories. They each presented brand asset models from the consumer's perspective, with brand loyalty being an essential dimension within the composition of brand assets, closest to the formation of brand assets.

Aaker (1991) posited that brand assets consist of five dimensions: (1) brand awareness, (2) brand associations, (3) perceived quality, (4) brand loyalty, and (5) other brand assets. This "Five Stars Model" presented the core content of brand assets and served as a foundation subsequently used and referenced by other scholars. However, this model did not explore the causes of brand loyalty or the process of brand asset formation. Building upon Aaker's work, Keller (1993) introduced the Brand Asset Knowledge Model. In his view, brand assets are the "knowledge" formed in the minds of

consumers, leading to various responses in the face of a company's marketing activities. By altering elements such as brand packaging and logos to influence consumer perceptions, companies can shape the "knowledge" within consumers' minds, ultimately leading to brand loyalty and sustainable profits. This laid the foundation for the academic exploration of brand assets.

On this basis, many scholars both domestically and internationally conducted research on brand assets in traditional settings. However, there has been a lack of research on brand assets in the context of the internet. Therefore, this paper, building upon the existing research on brand assets in traditional settings, defines the essence of brand assets in cross-border e-commerce from a consumer perspective. It analyzes six major factors influencing the formation of these assets: online store image, product quality, customer service, online store recognition, logistics service, and brand interaction. Based on relevant scales developed by previous scholars with necessary modifications, this paper forms a scale to investigate the mechanism of brand asset formation in cross-border e-commerce and conducts empirical analyses. This enriches the theoretical research system of brand assets with cross-border e-commerce as the main subject, expands the scope of brand asset theory, transitions from the study of traditional brands to emerging internet brands, and lays a foundation for future research on similar topics.

1.2 Literature Review

Keller (1993) [1] suggests that the online store image represents the overall perception of online consumers toward the store. Jacoby (1971) [2] points out that online consumers, due to their inability to physically touch products, rely on certain "cues" to assess product quality and service. These cues include both information directly related to product quality, such as production date, place of origin, shelf life, composition, and materials, as well as information

unrelated to product quality, such as the store's image, name, and certification symbols. According to his perspective, cues unrelated to the product also play a certain role. Thus, the online store's image can influence consumer decision-making to some extent. Wu Ruijuan (2021) [3] suggests that the quality of information design, visual design, and structural design within online stores significantly impacts consumers' willingness to shop online. Based on these studies, this paper concludes that when cross-border e-commerce consumers visit a company, they are often attracted by the design and layout of the online store, creating a positive impression and enhancing trust in the store.

Zhang Shengliang and Li Xiaodong (2013) [4] identified 27 factors grouped into six categories that affect consumer satisfaction in online shopping. Among these categories, the impact on satisfaction from high to low is as follows: product quality, delivery speed, website quality, seller credibility, product price, and interaction quality. In the cross-border e-commerce environment, overseas consumers have high expectations for product quality, and good quality products not only increase consumer satisfaction but also represent the first step in building trust.

Liu Yuhui (2016) [5] suggests that factors significantly influencing consumer satisfaction also include customer service quality, with customer service quality having the greatest impact on satisfaction. Zhang Hongwei (2018) [6] pointed out in a study on user satisfaction in cross-border e-commerce that customer service is one of the main factors affecting user satisfaction.

Page et al. (2002) [7] built on Keller's (1993) brand asset theory and defined website assets as the familiarity and perceived extent of consumers with the website. This definition stems from two dimensions of traditional brand asset theory: brand awareness and brand image. Brand awareness refers to the familiarity consumers have with the online store. As a result, online store familiarity

and recognition have become critical factors affecting the formation of brand assets. Yoo and Donthu (2001) [8] suggest that consumer perception significantly affects trust in the online store. Zhang Dan (2021) [9] proposes that in the context of cross-border e-commerce, consumers perceive lower risks in well-known and recognizable brands, leading to higher trust levels and increased likelihood of purchasing products from these brands. In virtual environments such as cross-border e-commerce, overseas consumers are often unfamiliar with stores. However, if they have prior consumption experiences or some knowledge of the company in other areas and can recognize a familiar company, this forms an initial positive impression, increasing trust in cross-border e-commerce companies.

Zheng Bing (2008) [10] divided B2C online store logistics services into five dimensions: customized service quality, order quality, delivery quality, response quality, and error handling quality. Among these, only response quality does not significantly impact consumer satisfaction. The other four dimensions have a significant impact on consumer satisfaction. Furthermore, logistics service quality enhances the quality of the relationship between companies and consumers, subsequently increasing loyalty. Zhang Kangkang (2019) [11] in a study on the quality of logistics services in cross-border e-commerce highlighted that the higher the service quality experienced by consumers, the more likely they are to make repeat purchases. Additionally, logistics service quality has a significant positive impact on satisfaction and trust. Li Mingming (2021) [12] suggested that the quality of logistics services in cross-border e-commerce has a significant positive impact on both consumer satisfaction and trust. From the above research, it is evident that the better the logistics services in cross-border e-commerce, with mechanisms for returns and exchanges in place, the fewer concerns cross-border consumers have during the online shopping process, leading to

higher satisfaction and trust among consumers.

Doney and Cannon (1997) [13] proposed that companies engage in frequent communication with consumers in two aspects: social interaction and information transmission, which help establish consumer trust and subsequently foster loyalty. Brodie (2011) [14] stated that consumers, through participation in interactions, enhance satisfaction, trust, and emotional attachment, ultimately promoting the formation of brand loyalty. Xu Xinliang (2021) [15] introduced brand interaction as one of the factors influencing brand value, effectively increasing consumer satisfaction and trust.

Youjae (1989) [16] posited that customer satisfaction can enhance attitudinal loyalty, repeat purchases, strengthen word-of-mouth communication, and reduce complaints, leading to loyal behavior. Bloemer et al. (1995) [17] found that brand satisfaction has a positive impact on brand loyalty, with explicit brand satisfaction having a greater effect on brand loyalty than implicit brand satisfaction. Yu Lin (2015) [18] examined the interaction between consumers and brands and categorized brand trust into transfer trust and experiential trust. The study found that customer satisfaction had a strong impact on experiential trust in brand trust. Xu Huizhen (2017) [19] conducted an empirical study on mobile shopping consumers and discovered that higher user satisfaction is associated with a higher likelihood of returning to an online store, indicating that higher satisfaction leads to higher loyalty. Gao Xiang et al. (2019) [20] built a consumer satisfaction model for cross-border e-commerce based on the European Customer Satisfaction Index (ECSI) model and found that consumer satisfaction positively affects loyalty. From these studies, it can be inferred that the more satisfied consumers are, the more likely they are to exhibit brand loyalty.

Morgan and Hunt (1994) [21] proposed that brand trust leads to the formation of brand loyalty or commitment and that trust can create high-value exchange relationships. Therefore, brand trust has

become an essential factor in consumers engaging in loyal behaviors such as repeat purchases. Zhang Ruixuan (2021) [22] found through a regression experiment with different brand mobile phones that brand trust serves as an intermediary between brand satisfaction and brand loyalty. Yin Xiajun (2021) [23] used a B2C cross-border import e-commerce platform as the research object, supported by the American Customer Satisfaction Index (ACSI) model. After empirical analysis, it was found that the higher the level of consumer trust, the more likely they are to exhibit consumer loyalty. Additionally, consumer satisfaction also influences consumer loyalty through website trust.

II. Research design

2.1. Model Construction

By reviewing existing literature and combining the discussions in the previous chapter regarding the factors influencing cross-border e-commerce brand assets, a more systematic research model is constructed, covering two main parts:

The first part focuses on the factors influencing cross-border e-commerce brand assets. Considering relevant literature and the characteristics of cross-border e-commerce, six potential factors that may affect the formation of cross-border brand assets are selected. These factors are as follows: online store image, product quality, customer service, online store recognition, logistics services, and brand interaction.

The second part pertains to cross-border e-commerce brand assets, which include three dimensions: brand satisfaction, brand trust, and brand loyalty. Furthermore, to clarify the mechanism behind the formation of cross-border e-commerce brand assets, an analysis of these three constituent elements is conducted, resulting in the construction of a model for the formation mechanism of cross-border e-commerce brand assets.

Thus, this paper builds upon prior research to create a model for the mechanism of cross-border

e-commerce brand asset formation, as depicted in Figure 2-1. The model incorporates research assumptions regarding the impact of factors on brand assets and assumptions about internal factors of brand assets to explore the formation mechanism of cross-border e-commerce brand assets.

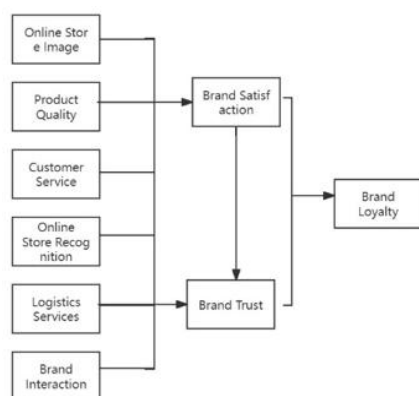


Fig. 2-1. Research model of the formation mechanism of cross-border e-commerce brand assets

2.2 Research Hypotheses

2.2.1 Research Hypotheses for Influencing Factors

(1) Regarding the study of online store image

Based on the theoretical model and literature review, this paper proposes the following hypotheses:

H1a: Online store image in cross-border e-commerce has a significant positive impact on brand satisfaction.

H1b: Online store image in cross-border e-commerce has a significant positive impact on brand trust.

(2) Regarding the study of product quality

H2a: Product quality in cross-border e-commerce has a significant positive impact on brand satisfaction.

H2b: Product quality in cross-border e-commerce has a significant positive impact on brand trust.

(3) Regarding the study of customer service

H3a: Customer service in cross-border e-commerce has a significant positive impact on brand satisfaction.

H3b: Customer service in cross-border e-commerce has a significant positive impact on brand trust.

(4) Regarding the study of online store recognition

H4a: Online store recognition in cross-border e-commerce has a significant positive impact on

brand satisfaction.

H4b: Online store recognition in cross-border e-commerce has a significant positive impact on brand trust.

(5) Regarding the study of logistics services

H5a: Logistics services in cross-border e-commerce have a significant positive impact on brand satisfaction.

H5b: Logistics services in cross-border e-commerce have a significant positive impact on brand trust.

(6) Regarding the study of brand interaction

H6a: Brand interaction in cross-border e-commerce has a significant positive impact on brand satisfaction.

H6b: Brand interaction in cross-border e-commerce has a significant positive impact on brand trust.

(7) Regarding the relationships within brand assets

H7a: Brand satisfaction has a significant positive impact on brand trust.

H7b: Brand satisfaction has a significant positive impact on brand loyalty.

H8: Brand trust has a significant positive impact on brand loyalty.

H9: Brand trust mediates the relationship between brand satisfaction and brand loyalty.

2.3 Questionnaire Design

This research involves nine variables in total. There are six variables related to the factors influencing cross-border e-commerce brand assets, including online store image, product quality, customer service, online store recognition, logistics services, and brand interaction. Additionally, there are three variables associated with cross-border e-commerce brand assets: brand satisfaction, brand trust, and brand loyalty.

The designed questionnaire consists of three main parts: the section on consumers' cross-border purchasing experiences, the main questionnaire section, and consumers' personal information. In the main questionnaire section, a Likert seven-point scale is used, and the preface of the questionnaire clearly explains the research objectives to ensure that respondents complete the questionnaire accurately.

The first part focuses on consumers' cross-border purchasing experiences and consists of two questions. The first question inquires about the frequency of the respondents' cross-border online purchases and presents various methods of purchasing from cross-border e-commerce platforms. This question is intended to filter out respondents without cross-border shopping experience, ensuring the accuracy of empirical

analysis. The second question asks respondents to specify the product category they have purchased that left the deepest impression. This question is designed to understand the most popular product categories in cross-border e-commerce, enhance awareness of cross-border e-commerce development, and further confirm whether consumers have actual cross-border online shopping experiences.

Table 2-1 Measurement Items

Variable	Items	Measurement Items
Online Store Image	A1	The design of this online store is attractive and visually appealing.
	A2	The interface of this online store is clear and pleasant.
	A3	This online store has rich content, including product details and customer reviews for reference.
	A4	Using this online store is simple and convenient.
	A5	This online store has a search box and category navigation, making it easy for me to find the products I want.
Product Quality	B1	This online store offers a wide variety of products to choose from.
	B2	The products from this online store meet my needs.
	B3	The product quality of this online store is good.
	B4	The products purchased from this online store match their descriptions and meet my expectations.
Customer Service	C1	The customer service of this online store responds promptly.
	C2	The customer service of this online store is polite and friendly.
	C3	The customer service of this online store possesses sufficient product knowledge.
	C4	The customer service of this online store can effectively address my issues.
Online Store Recognition	D1	The name of this online store is easy to remember.
	D2	I can think of some characteristics of this online store.
	D3	I can quickly recall the logo and symbols of this online store.
	D4	I can differentiate this online store from other stores easily.
Logistics Services	F1	The logistics of this online store deliver products in a timely manner.
	F2	The logistics of this online store ensure that products are well-packaged.
	F3	The logistics of this online store provide timely updates on shipment information.
	F4	The logistics costs of this online store are reasonable.
	F5	The logistics of this online store are flexible, offering overseas direct shipping and bonded warehouse delivery options.
Brand Interaction	I1	This online store offers various interaction methods, such as live streaming, social media, and community engagement.
	I2	I often watch the live streams, read, or engage with social media content related to this online store.
	I3	Through brand interaction, I can obtain useful information and enhance my willingness to make purchases.
Brand Satisfaction	I5	I can share my experiences and reviews with others.
	I6	I can join the online store's community and interact with other consumers.
	G1	Shopping at this online store gives me a pleasant feeling.
	G2	Shopping at this online store evokes a positive feeling.
	G3	I believe that shopping at this online store was the right decision.
Brand Trust	G4	Overall, I have a favorable impression of this online store.
	G5	Overall, I am satisfied with this online store.
	H1	I trust this online store.
	H2	This online store has the capability to protect the interests of customers.
	H3	This online store fulfills its promises to customers.
Brand Loyalty	H4	Shopping at this online store is safe and reliable.
	H5	I consider this online store to be trustworthy.
	J1	When I need similar foreign products, I will prioritize choosing this online store.
	J2	I will purchase products from this online store again.
Brand Loyalty	J3	I will consider buying other products from this online store.
	J4	I would recommend this online store to my friends.

The second part is the main body of the questionnaire. Each part contains a minimum of four or more questions to ensure the reliability and validity of subsequent analysis. The Likert seven-point scale is employed to ensure the detail and nuance of respondents' agreement levels based on their actual purchase experiences.

The third part consists of respondents' basic personal information, including gender, age, level of education, and home country. This information will be used for descriptive statistical analysis and relevant conclusions.

The specific questionnaire content is shown in Table 2-1:

III. Empirical Analysis

A survey was conducted using an online questionnaire, starting in early March 2023 and concluding in late May, spanning approximately three months. In total, 542 questionnaires were collected, and after screening, 480 valid

questionnaires were retained, resulting in an effective response rate of 88.6%.

3.1 Descriptive Analysis

3.1.1 Sample Distribution

The distribution of the sample is presented in Table 3-1.

3.1.2 Descriptive statistics of variables

3.2 Reliability and Validity

3.2.1 Reliability Analysis

In this study, we used SPSS 24.0 software to test the reliability of each variable. All variables in this study, including website image, product quality, customer service, website recognition, shopping experience, logistics service, brand interaction, brand satisfaction, brand trust, brand loyalty, and their respective subscales, exhibited Cronbach's alpha (α) values exceeding 0.8. Additionally, the Corrected Item-Total Correlation (CITC) for each item exceeded 0.5. This indicates that the questionnaire items have good internal consistency and high reliability, supporting further data analysis.

Table 3-1 Sample distribution

Statistical Variables:	Categories	Number	Percentage
Cross-border Online Shopping Frequency	1-2 times	188	39.2%
	3-5 times	156	32.5%
	5-10 times	136	28.3%
Cross-border Online Shopping Categories	Consumer Electronics	116	24.2%
	Beauty and Cosmetics	193	40.2%
	Bags and Accessories	17	3.4%
	Clothing and Footwear	94	19.6%
	Personal Care	38	8.0%
	Other	22	4.6%
Gender	Male	217	45.2%
	Female	263	54.8%
Age	20 years old and below	27	5.6%
	20-25 years old	360	75%
	25-30 years old	90	18.8%
	30 years old and above	3	0.6%
Education Level	High School or below	6	1.3%
	High School	10	2.1%
	Bachelor's Degree	353	73.5%
Country of Origin	Master's Degree	110	22.09%
	Doctorate (Ph.D.)	1	0.2%
	English-speaking countries (e.g., US, UK, Germany, Canada)	213	44.4%
	Other countries	267	55.6%

Table 3-2. Descriptive Statistics

Variable	Measurement Item	Mean	Standard Deviation
Website Image	The website is aesthetically designed and attractive.	5.135	1.125
	The website interface is clear and pleasant.	5.325	1.122
	The website content is rich with product details and customer reviews for reference.	5.481	1.134
	Using the website is simple and convenient.	5.494	1.136
	The website has a search box and category navigation, making it easy to find the products I want.	5.606	1.086
Product Quality	The website offers a wide range of products to choose from.	5.573	1.079
	The products on the website meet my needs.	5.679	1.076
	The product quality on the website is good.	5.767	1.034
Customer Service	The products I purchase on the website match the descriptions and meet my expectations.	5.725	1.048
	The customer service on the website responds promptly.	5.377	1.239
	The customer service on the website has a warm and polite attitude.	5.400	1.213
	The customer service on the website possesses sufficient product knowledge.	5.340	1.239
Website Identification	The customer service on the website can effectively resolve my issues.	5.340	1.212
	The name of the website is easy to remember.	5.329	1.410
	I can think of some distinctive features of the website.	5.121	1.406
	I can quickly recall the logo and symbols of the website.	5.325	1.481
Logistics Service	I can distinguish this website from other websites.	5.310	1.416
	The website's logistics can deliver products in a timely manner.	5.567	1.279
	The website's logistics can ensure that products are well-packaged.	5.871	1.130
	The website's logistics can provide timely updates on the shipping information.	5.746	1.180
	The logistics costs on the website are reasonable.	5.556	1.199
	The logistics on the website offer flexibility, including overseas direct shipping and bonded warehouses.	5.665	1.215
Brand Interaction	The website offers a variety of interactive features, such as live streaming, social media, and community interaction.	5.054	1.404
	I frequently watch live streams on the website and read or share social media content related to it.	4.183	1.799
	Through brand interaction, I can obtain useful information and enhance my willingness to make purchases.	4.769	1.529
	I can share my experiences and reviews with others.	4.750	1.614
	I can join the website's community and interact with other consumers.	3.910	1.888
Brand Satisfaction	Shopping on this website gives me a pleasant feeling.	5.333	1.182
	Shopping on this website gives me a positive feeling.	5.162	1.198
	I believe that shopping on this website is the right decision.	5.348	1.196
	Overall, I have a good impression of this website.	5.485	1.112
Brand Trust	Overall, I am satisfied with this website.	5.585	1.078
	I trust this website.	5.535	1.170
	This website has the ability to safeguard customers' interests.	5.460	1.191
	This website fulfills its commitments to customers.	5.535	1.172
	Shopping on this website is safe and reliable.	5.527	1.136
	I believe this website is trustworthy.	5.577	1.180
Brand Loyalty	When I need similar foreign products, I would prefer to choose this website.	5.440	1.278
	I would make repeat purchases of products from this website.	5.431	1.249
	I would consider buying other products from this website.	5.440	1.167
	I would recommend this website to my friends.	5.219	1.416

3.2.2 Validity Analysis

(1) Convergent Validity

All measurement items have standard loadings (factor loadings) exceeding 0.6, which is higher than the typical standard of 0.5. The Average Variance Extracted (AVE) values for each of the

nine factors are also above the 0.5 standard. The Composite Reliability (CR) values are all above 0.8, surpassing the 0.7 standard. This indicates that the official survey questionnaire used in this study has good convergent validity.

Table 3-3. Reliability Analysis

Variable	Measurement Item	Corrected Item-Total Correlation	Deleted Items α Coefficient	Cronbach α
Website Image	The website is aesthetically designed and attractive.	5.135	1.125	0.896
	The website interface is clear and pleasant.	5.325	1.122	
	The website content is rich with product details and customer reviews for reference.	5.481	1.134	
	Using the website is simple and convenient.	5.494	1.136	
	The website has a search box and category navigation, making it easy to find the products I want.	5.606	1.086	
Product Quality	The website offers a wide range of products to choose from.	5.573	1.079	0.884
	The products on the website meet my needs.	5.679	1.076	
	The product quality on the website is good.	5.767	1.034	
	The products I purchase on the website match the descriptions and meet my expectations.	5.725	1.048	
Customer Service	The customer service on the website responds promptly.	5.377	1.239	0.909
	The customer service on the website has a warm and polite attitude.	5.400	1.213	
	The customer service on the website possesses sufficient product knowledge.	5.340	1.239	
Website Identification	The customer service on the website can effectively resolve my issues.	5.340	1.212	0.881
	The name of the website is easy to remember.	5.329	1.410	
	I can think of some distinctive features of the website.	5.121	1.406	
	I can quickly recall the logo and symbols of the website.	5.325	1.481	
	I can distinguish this website from other websites.	5.310	1.416	
Logistics Service	The website's logistics can deliver products in a timely manner.	5.567	1.279	0.89-
	The website's logistics can ensure that products are well-packaged.	5.871	1.130	
	The website's logistics can provide timely updates on the shipping information.	5.746	1.180	
	The logistics costs on the website are reasonable.	5.556	1.199	
	The logistics on the website offer flexibility, including overseas direct shipping and bonded warehouses.	5.665	1.215	
Brand Interaction	The website offers a variety of interactive features, such as live streaming, social media, and community interaction.	5.054	1.404	0.861
	I frequently watch live streams on the website and read or share social media content related to it.	4.183	1.799	
	Through brand interaction, I can obtain useful information and enhance my willingness to make purchases.	4.769	1.529	
	I can share my experiences and reviews with others.	4.750	1.614	
	I can join the website's community and interact with other consumers.	3.910	1.888	
Brand Satisfaction	Shopping on this website gives me a pleasant feeling.	5.333	1.182	0.919
	Shopping on this website gives me a positive feeling.	5.162	1.198	
	I believe that shopping on this website is the right decision.	5.348	1.196	
	Overall, I have a good impression of this website.	5.485	1.112	
	Overall, I am satisfied with this website.	5.585	1.078	
Brand Trust	I trust this website.	5.535	1.170	0.930
	This website has the ability to safeguard customers' interests.	5.460	1.191	
	This website fulfills its commitments to customers.	5.535	1.172	
	Shopping on this website is safe and reliable.	5.527	1.136	
Brand Loyalty	I believe this website is trustworthy.	5.577	1.180	0.899
	When I need similar foreign products, I would prefer to choose this website.	5.440	1.278	
	I would make repeat purchases of products from this website.	5.431	1.249	
	I would consider buying other products from this website.	5.440	1.167	
	I would recommend this website to my friends.	5.219	1.416	

Table 3-4. Aggregated Validity Analysis (N=480)

Variable	Measurement Item	Unstandardized Loading Coefficient (Coef.)	Standard Error (Std.Error)	Standard Loading Coefficient (Std.Estimate)	Average Variance Extracted (AVE)	Composite Reliability (CR)
Website Image	A1	1.000	-	0.691	0.545	0.857
	A2	1.085	0.073	0.751		
	A3	1.086	0.074	0.745		
	A4	1.106	0.074	0.757		
	A5	1.043	0.071	0.747		
Product Quality	B1	1.000	-	0.720	0.644	0.878
	B2	1.077	0.066	0.777		
	B3	1.170	0.064	0.879		
	B4	1.111	0.064	0.824		
Customer Service	C1	1.000	-	0.855	0.707	0.906
	C2	0.993	0.041	0.866		
	C3	0.961	0.044	0.821		
	C4	0.939	0.043	0.820		
Website Identification	D1	1.000	-	0.769	0.648	0.880
	D2	1.024	0.058	0.789		
	D3	1.131	0.061	0.827		
	D4	1.086	0.058	0.832		
Logistics Service	F1	1.000	-	0.807	0.611	0.887
	F2	0.918	0.044	0.838		
	F3	0.913	0.047	0.798		
	F4	0.891	0.048	0.767		
	F5	0.810	0.050	0.688		
Brand Interaction	I1	1.000	-	0.635	0.848	0.857
	I2	1.657	0.116	0.822		
	I3	1.425	0.099	0.832		
	I5	1.226	0.099	0.678		
Brand Satisfaction	I6	1.503	0.116	0.711	0.691	0.918
	G1	1.000	-	0.823		
	G2	0.990	0.048	0.804		
	G3	0.996	0.048	0.810		
	G4	0.986	0.043	0.862		
Brand Trust	G5	0.950	0.042	0.857	0.732	0.932
	H1	1.000	-	0.822		
	H2	1.077	0.046	0.870		
	H3	1.057	0.045	0.868		
	H4	0.994	0.044	0.842		
Brand Loyalty	H5	1.075	0.045	0.876	0.697	0.902
	J1	1.000	-	0.813		
	J2	1.064	0.046	0.885		
	J3	0.972	0.044	0.865		
	J4	1.052	0.055	0.772		

(2) Discriminant Validity

As shown in Table 3-6, the square roots of the AVE values for each variable are greater than the correlation coefficients between that variable and other variables. This indicates that the official survey questionnaire used in this study has good discriminant validity.

If you have any more questions or need further assistance with your research analysis or any other aspect, please feel free to ask.

3.3 Correlation Analysis

This study employed Pearson's correlation analysis. As shown in Table 3-6, the average values of the correlation coefficients between variables are above 0.4, and they are significantly correlated at the 0.01 level. Furthermore, all correlation coefficients between variables are below 0.75, indicating the absence of multicollinearity issues among the variables. To further validate the research hypotheses, the next step of analysis is required.

Table 3-5. Pearson Correlations and Square Roots of AVE (N=480)

variable	A	B	C	D	F	I	G	H	J
A	0.819								
B	0.681	0.864							
C	0.568	0.607	0.894						
D	0.525	0.515	0.470	0.865					
F	0.611	0.616	0.614	0.469	0.875				
I	0.311	0.275	0.338	0.363	0.219	0.828			
G	0.622	0.625	0.615	0.598	0.624	0.502	0.879		
H	0.605	0.627	0.582	0.541	0.630	0.429	0.768	0.929	
J	0.523	0.557	0.534	0.547	0.567	0.438	0.679	0.747	0.889

Table 3-6. Correlation Analysis

variable	A	B	C	D	F	I	G	H	J
A	1								
B	0.639**	1							
C	0.580**	0.619**	1						
D	0.517**	0.516**	0.481**	1					
F	0.579**	0.584**	0.612**	0.465**	1				
I	0.327**	0.293**	0.361**	0.377**	0.218**	1			
G	0.600**	0.606**	0.612**	0.573**	0.603**	0.518**	1		
H	0.581**	0.609**	0.590**	0.542**	0.633**	0.427**	0.715**	1	
J	0.546**	0.583**	0.553**	0.528**	0.575**	0.429**	0.687**	0.731**	1

3.4 Testing the Hypotheses

Structural Equation Modeling (SEM) is a multivariate data analysis technique used to investigate the relationships between multiple variables and validate the model's construction and hypotheses. In this study, we used AMOS 25.0

software to analyze the survey data, obtaining relevant data on the fit indices of the structural equation model.

The chi-square-to-degrees-of-freedom ratio is 2.165, which satisfies the Carmines and McIver (1991) criterion, being greater than 2 but less than

Table 3-7. Fit Indices for Structural Equation Model

Common Indices	χ^2/df	GFI	RMSEA	RMR	CFI	NFI	AGFI	IFI
Criteria	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9	>0.9
Value	2.165	0.931	0.049	0.037	0.951	0.912	0.920	0.951

Table 3-8. Model Path Coefficients and Significance Levels

Path	Unstandardized Regression Coefficient	SE	z (CR Value)	p	Standardized Regression Coefficient	Conclusion
A→G	0.125	0.072	1.602	0.144	0.107	不支持
A→H	0.025	0.079	0.313	0.754	0.020	不支持
B→G	0.193	0.077	2.512	0.012	0.154	支持
B→H	0.192	0.075	2.558	0.011	0.155	支持
C→G	0.092	0.047	1.978	0.048	0.100	支持
C→H	0.001	0.045	0.016	0.907	0.001	不支持
D→G	0.181	0.040	4.552	0.000	0.196	支持
D→H	0.016	0.039	0.395	0.693	0.018	不支持
F→G	0.255	0.052	4.913	0.000	0.271	支持
F→H	0.169	0.052	3.224	0.001	0.182	支持
I→G	0.308	0.044	6.976	0.000	0.282	支持
I→H	0.096	0.044	2.189	0.029	0.089	支持
G→J	0.515	0.067	7.659	0.000	0.521	支持
G→H	0.258	0.071	3.621	0.000	0.242	支持
H→J	0.661	0.077	8.610	0.000	0.611	支持

5. The goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) are 0.931 and 0.920, respectively, both exceeding the standard of 0.9. The root mean square error of approximation (RMSEA) is 0.049, and the root mean square residual (RMR) is 0.037, both below the critical values of 0.10 and 0.05, respectively. The comparative fit index (CFI), normed fit index (NFI), and incremental fit index (IFI) are 0.951, 0.912, and 0.951, respectively, all surpassing the 0.9 standard.

As shown in Table 2-7, all fit indices meet the criteria, indicating that the structural equation model fits well. Therefore, we can accept the theoretical model proposed in this study.

As per the hypotheses and the regression results of the structural equation model mentioned above, our study posits that brand satisfaction not only directly influences brand loyalty but also has an impact on brand loyalty through brand trust. Therefore, in this section, we will examine the mediating effect of brand trust using the Bootstrap method recommended by Hayes (2013) [24]. We set

the number of Bootstrap iterations to 2000 with a 95% confidence interval. If the 95% confidence interval of the indirect effect does not include zero, it indicates a significant mediating effect, signifying the presence of a mediation effect. Additionally, if the 95% confidence interval of the direct effect includes zero, it suggests a significant direct effect, further implying a full mediation effect.

The results from Table 3-9 indicate that the bias-corrected 95% confidence interval of the indirect effect [0.204, 0.468] and the direct effect [0.058, 0.464] does not include zero. This signifies a significant mediating effect of brand trust, and brand trust partially mediates the relationship between brand satisfaction and brand loyalty. Moreover, the 95% confidence interval for the percentile method also demonstrates that the indirect effect [0.192, 0.455] and the direct effect [0.060, 0.468] do not include zero, indicating the presence of a mediating effect, with brand trust partially mediating this relationship. In the standardized environment, the indirect effect of

Table 3-9. Mediation Analysis for Brand Trust

Effect	Standardized Estimate	BootSE	Bootstrapping			
			Bias-corrected 95% CI		Percentile 95%	
			Lower	Upper	Lower	Upper
Total Effect	0.560	0.079	0.398	0.702	0.406	0.715
Indirect Effect	0.242	0.105	0.204	0.468	0.192	0.455
Direct Effect	0.318	0.065	0.058	0.464	0.060	0.468

Table 3-10. Research Hypothesis Test Results

Number	Hypothesis Content	Hypothesis Test Results
H1a	Cross-border e-commerce website image has a significantly positive impact on brand satisfaction.	Not Supported
H1b	Cross-border e-commerce website image has a significantly positive impact on brand trust.	Not Supported
H2a	Cross-border e-commerce product quality has a significantly positive impact on brand satisfaction.	Supported
H2b	Cross-border e-commerce product quality has a significantly positive impact on brand trust.	Supported
H3a	Cross-border e-commerce customer service has a significantly positive impact on brand satisfaction.	Supported
H3b	Cross-border e-commerce customer service has a significantly positive impact on brand trust.	Not Supported
H4a	Cross-border e-commerce website recognition has a significantly positive impact on brand satisfaction.	Supported
H4b	Cross-border e-commerce website recognition has a significantly positive impact on brand trust.	Not Supported
H5a	Cross-border e-commerce logistics service has a significantly positive impact on brand satisfaction.	Supported
H5b	Cross-border e-commerce logistics service has a significantly positive impact on brand trust.	Supported
H6a	Cross-border e-commerce brand interaction has a significantly positive impact on brand satisfaction.	Supported
H6b	Cross-border e-commerce brand interaction has a significantly positive impact on brand trust.	Supported
H7a	Brand satisfaction has a significantly positive impact on brand trust.	Supported
H7b	Brand satisfaction has a significantly positive impact on brand loyalty.	Supported
H8	Brand trust has a significantly positive impact on brand loyalty.	Supported
H9	Brand trust acts as a mediator between brand satisfaction and brand loyalty.	Supported

brand satisfaction on brand loyalty is 0.242, the direct effect is 0.318, resulting in a total effect of 0.560 (0.242 + 0.318). Therefore, we can conclude that Hypothesis H9 is supported.

The results of the hypothesis testing are presented in Table 3-10.

IV. Discussion and Insights

4.1 Discussion

4.1.1 Discussion of Brand Influencing Factors

(1) Impact of Brand Influencing Factors on Brand Satisfaction

Apart from online store image, product quality, customer service, online store recognition, logistics services, and brand interaction all have a significant positive impact on brand satisfaction. Among these factors, brand interaction has the most significant influence on brand satisfaction, with a standardized path coefficient of 0.282. This suggests that brand interaction plays a crucial role in the formation of brand satisfaction, contributing to enhancing consumers' positive and enjoyable shopping experiences. Consumers who engage in live interactions with sellers, social media interactions, and communication with previous customers tend to have more favorable evaluations of cross-border online stores, further strengthening their positive perceptions. Another factor with a substantial impact is logistics services, with a standardized path coefficient of 0.271. This indicates that efficient, prompt, secure, and reliable cross-border logistics contribute to creating a positive impression in consumers' minds and improving their satisfaction during the purchasing process.

(2) Impact of Brand Influencing Factors on Brand Trust

Product quality, logistics services, and brand interaction have a significant positive impact on brand trust, while online store image, customer service, and online store recognition do not significantly influence brand trust. Product quality,

as the concrete manifestation of brand product strength, directly influences consumers' trust. Fast and convenient logistics services also play a significant role in increasing consumer trust levels. The information quality derived from interaction is higher than other forms of information quality, and high-quality information enhances consumer trust.

Online store image, customer service, and online store recognition do not instill trust in consumers. Although this study suggests that online store image does not affect consumer satisfaction and trust, it doesn't mean that cross-border e-commerce operators should neglect the shaping of online store and brand images. Operators should reassess their product advantages, design online stores that highlight their unique features, and continually update them as needed.

Customer service does not significantly affect brand trust because consumers do not frequently interact with customer service during the shopping process. Important information about products and logistics delivery is already clearly presented in the details section. Additionally, customer service is associated with the seller, and evaluations from the seller's perspective tend to be subjective. Such subjective information does not inspire significant trust in consumers. Instead, consumers primarily rely on brand interactions, reviews from previous customers, and content from live streams to mitigate the risks associated with information asymmetry.

Online store recognition is based on cross-border consumers' past shopping experiences or the branding stimuli received from the brand. From the empirical analysis results, it is evident that the recognizability of online stores is insufficient to support trust in the online store. Since many sellers offer the same brand, consumers cannot readily distinguish trustworthy online stores. They need additional information to make judgments, and the knowledge they have developed from the past is often overwhelmed by the vast amount of information available in the

online marketplace. Moreover, this study leans toward complete trust rather than initial trust. Online store recognition might to some extent contribute to consumers' initial trust. In the environment of the internet, flooded with high-quality and low-quality information, consumers face a lack of information and rational judgment, making it necessary to rely on other information sources as a basis for evaluating whether a cross-border e-commerce enterprise is trustworthy.

4.1.2 Discussion of Brand Formation

(1) The Influence of Brand Satisfaction on Brand Trust

From the results of empirical analysis, it is evident that brand satisfaction has a significant positive impact on brand trust, with a standardized path coefficient of 0.242. This means that the more positive impressions and emotions cross-border e-commerce consumers accumulate during the online shopping process, the deeper their relationship with the brand becomes, ultimately leading to brand trust. Cross-border e-commerce consumers face numerous risks and information asymmetry in a virtual shopping environment. Thus, a satisfactory and positive shopping experience helps reduce uncertainties and doubts in the minds of consumers, strengthening their favorable feelings toward the brand. Trust is accumulated from one satisfying shopping experience to another. Therefore, cross-border e-commerce practitioners can enhance brand trust by improving brand satisfaction through quality control of products, customer service, online store recognition, logistics services, and brand interaction.

(2) The Influence of Brand Satisfaction on Brand Loyalty

Based on the results of the previous chapter's empirical analysis, this study found that brand satisfaction has a significant positive impact on brand loyalty, with a standardized path coefficient of 0.521. This indicates that, before consumers

form brand loyalty, they first develop positive evaluations and feelings about the online store. The results suggest that brand satisfaction is fundamental and crucial for consumers, and if the factors within the online store fail to satisfy consumers, the foundation of brand assets, brand satisfaction, will not be established. Consequently, the willingness of cross-border consumers to continue purchasing products from the brand is significantly reduced, and they won't progress to deeper levels of loyalty. Therefore, the overall shopping experience of cross-border e-commerce consumers is critically important. Their perceptions of the key drivers of brand assets determine whether their trust and loyalty will be strengthened.

(3) The Influence of Brand Trust on Brand Loyalty

The analysis results of this study show that both brand satisfaction and brand trust have a significant impact on brand loyalty, but the influence of brand trust is more pronounced, with a standardized path coefficient of 0.611, greater than the direct impact of brand satisfaction (0.521) on brand loyalty. Trust is a key factor that influences consumers' decisions to make repeat purchases, cross-purchases, or even recommend purchases. If consumers trust a particular business, they are less likely to switch to another business, even if the price of that business is not the most competitive or if their products and services are not the best. The study suggests that this is primarily due to the virtual nature of the internet, where consumers can only obtain information about a business through various online sources. Consumers cannot interact with businesses face-to-face or personally assess product quality or the production process. Additionally, information is asymmetric. Although consumers can use various channels such as cross-border e-commerce platforms and social media to search for information and increase their knowledge and understanding of the cross-border e-commerce business, these information channels are often exploited by businesses. As a result,

consumers find it difficult to identify genuine information about business quality, and they are unable to determine the credibility of the information. Considering the imbalance of information, consumers are in a disadvantaged position, which, to some extent, increases the conversion cost for consumers to switch trust from one business to another. Therefore, trust is of paramount importance in forming brand loyalty.

(4) The Mediating Effect of Brand Trust

The analysis results of this study reveal that brand satisfaction not only directly exerts a significant positive impact on brand loyalty, with a standardized path coefficient of 0.521, but also influences brand loyalty significantly through brand trust. In other words, brand trust plays a mediating role between brand satisfaction and brand loyalty. This indicates that the more satisfied cross-border e-commerce consumers are with a business, the more likely they are to develop trust in that business, and they are more likely to form brand loyalty.

4.2 Recommendations

4.2.1 Enhancing Logistics Services

Efficient logistics service capabilities originate from supply chain production, layout, and the ability to coordinate and integrate with third-party logistics. For most businesses collaborating with cross-border e-commerce platform companies on logistics, the platform logistics' "empowerment" can improve the company's logistics fulfillment capabilities. This is primarily reflected in downstream logistics, including platform logistics clearance, transportation, customs clearance, distribution, delivery, returns, and exchanges. In the upstream logistics aspects, the rhythm of supply chain production, layout, and management is an area that businesses need to focus on and improve. For businesses collaborating with third-party logistics, finding reliable partners has become a crucial task in cross-border e-commerce operations. Additionally, it is essential to improve the after-sales service system for cross-border

e-commerce and establish an appropriate return and exchange mechanism, utilizing overseas warehousing to provide cross-border consumers with better and more convenient return and exchange services. Cross-border logistics, as the bridge between online and offline, plays a significant role in reducing the time consumers have to wait, eliminating their psychological unease, and lowering perceived risks, thereby enhancing brand trust.

4.2.2 Prioritizing Product Quality

Product quality is a critical element in the operation of cross-border e-commerce businesses and is the foundation for the brand's survival. High-quality products not only satisfy consumers, but as the number of purchases increases, consumer brand trust also rises, resulting in a series of brand loyalty behaviors, including repeat purchases, cross-purchases, and recommendations. In contrast, low-quality products not only affect consumer satisfaction and trust but also lead to post-sales service issues such as returns and complaints. Products and brands are interdependent and mutually supportive. Without good products and rigorous quality control capabilities, brand construction cannot even begin. Many cross-border e-commerce enterprises today are enthusiastic about overseas social media marketing and influencer marketing but often overlook product innovation and quality control. If marketing can make cross-border e-commerce businesses move faster, then products can make them go further. For cross-border consumers in developed countries like Europe and the United States, their quality requirements are relatively high. Therefore, cross-border e-commerce businesses should strive to enhance their product innovation capabilities and product quality control to avoid consumer fatigue and provide a broader, higher-quality range of choices.

4.2.3 Focus on Interaction with Consumers

Creating an official page on social media platforms like Facebook, Instagram, Twitter, TikTok, etc., to showcase the company brand, conduct 24-hour product displays and self-service sales, create corporate communities and dynamic advertisements, and collaborate with celebrities and independent creators for joint promotions. Cross-border e-commerce also has the characteristic of network externality, where the utility derived by each user from using a product is directly proportional to the number of users using that product. The more consumers participate in online store discussions, exchanges, and interactions, the more they can realize an increase in value. This is one of the reasons why the internet economy is known as the "traffic economy." Positive product displays left by consumers can potentially influence the trust of the next consumer. With an increasing number of positive reviews, the brand assets of cross-border e-commerce businesses continue to accumulate. In addition, cross-border e-commerce operators should pay close attention to consumer feedback and suggestions, making timely adjustments and improvements where necessary, to maximize the shopping experience for consumers.

V. Conclusion and Outlook

This study validated the key factors and mechanisms influencing the formation of brand assets in cross-border e-commerce through empirical analysis of the brand asset formation mechanism model. First, among the factors influencing brand assets in cross-border e-commerce, aside from online store image, product quality, customer service, online store recognition, logistics services, and brand interaction all have a significant positive impact on brand satisfaction. Second, product quality, logistics services, and brand interaction have a significant positive impact

on brand trust, while the impact of online store image, customer service, and online store recognition on brand trust is not significant. Finally, within the dimensions of brand asset composition, both brand satisfaction and brand trust have a significant positive impact on brand loyalty, with brand trust playing a partially mediating role in the impact of brand satisfaction on brand loyalty.

Through empirical data analysis, this study identified some of the factors affecting the formation of brand assets in cross-border e-commerce. However, with the passage of time and the development of new models and formats in cross-border e-commerce, new influencing factors may emerge, and the degree of impact on brand asset formation may change. Therefore, future research should focus on the overall development of the entire cross-border e-commerce industry and design scales and questionnaires that better align with the specific characteristics of cross-border e-commerce businesses at the micro-level. Due to resource and logistical constraints, this study was unable to conduct a more detailed analysis of overseas consumer groups from different countries and different levels of purchasing power. It is expected that in future research, with the foundation of practical experience, efforts will be made to secure more favorable resources for such studies. This study is based on the theory of brand assets from a consumer perspective and focuses on research related to cross-border e-commerce enterprises. It is hoped that in the future, there will be more research on brand building by various entities in the internet, enriching a more comprehensive theoretical system of brand assets in an internet context.

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