

Using the Lanchester sport combat theory model to analyze the competitive entry strategy of the cross-border e-commerce market in southeast Asia – for example as cross-border e-commerce in Taiwan, China

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Abstract: The World Trade Organization (WTO) defines cross-border e-commerce as "the cross-border transaction of goods and services by electronic means" [1]. When entering the target market, enterprises need to clarify their market positioning, systematically analyze the overall competitive environment, evaluate their comprehensive competitiveness relative to competitors, and use market share as the core indicator to differentiate their advantages. Additionally, enterprises can utilize multi-attribute decision-making (MADM) methods to enhance the scientific and effective decision-making process. This study aims to provide feasible suggestions on competitive positioning and market entry strategies for Taiwanese cross-border e-commerce enterprises seeking to expand into the ASEAN market, thereby supporting their sustainable development in the regional market. Taiwan's competitiveness in the Southeast Asian e-commerce market is approximately 3 to 10 times smaller than that of major competitors, and according to Lanchester's law of range, this market is in the range of 0.20. The total size of the e-commerce market across the six ASEAN countries reached 7 billion US dollars, accounting for 0.7% of the global market. Taiwan, China strives for the e-commerce market potential of the six ASEAN countries = $3.47/0.7 = 4.95$ 7, and Taiwan, China strives for the e-commerce market potential of the six ASEAN countries = $3.47/0.7 = 4.95$ 7, and it is estimated that the potential market share of Taiwan's e-commerce in ASEAN is 4.95 times the current level. Taiwan's strategic focus is on Vietnam, Thailand, and the Philippines, among which Vietnam presents the biggest opportunity. Taiwan, China, strives for Vietnam's global e-commerce market potential, calculated as $3.47/0.08=43.37$. Taiwan, China's global e-commerce market potential is $3.47/0.08=43.37$, and it is estimated that the potential market share of Taiwan's e-commerce in Vietnam is 43.37 times the current level.

Keywords: Cross-border e-commerce, Entry strategy, Lanchester's rule, Sports.

1. Background

Driven by economic globalization and the digitalization of e-commerce, cross-border e-commerce is reshaping the new pattern of international trade. The development of China's cross-border e-commerce and the potential of Southeast Asia's e-commerce market have had a profound impact on the development of global trade. It is of great practical significance to study the dynamics of these two markets and their interaction mechanisms to promote the global economy.

1.1. The Vigorous Development of China's Cross-Border E-Commerce Market

1.1.1. Market Size and Growth

China's cross-border e-commerce occupies an important position in the global market and has maintained rapid growth in recent years. In 2024, according to the statistics of the General Administration of Customs of China, the total import and export volume of China's cross-border e-commerce will be 2.63 trillion yuan, an increase of 10.8% year-on-year, and the scale of trade has increased by more than 10 times in the past five years. According to data released on the official website of the Overseas Chinese Affairs Commission of the Republic of China, in the first half of 2024, Taiwan's e-commerce industry continued its growth trajectory, with online sales reaching NT\$313.9 billion (about US\$9.6 billion), an increase of 3% over the same period in 2023.

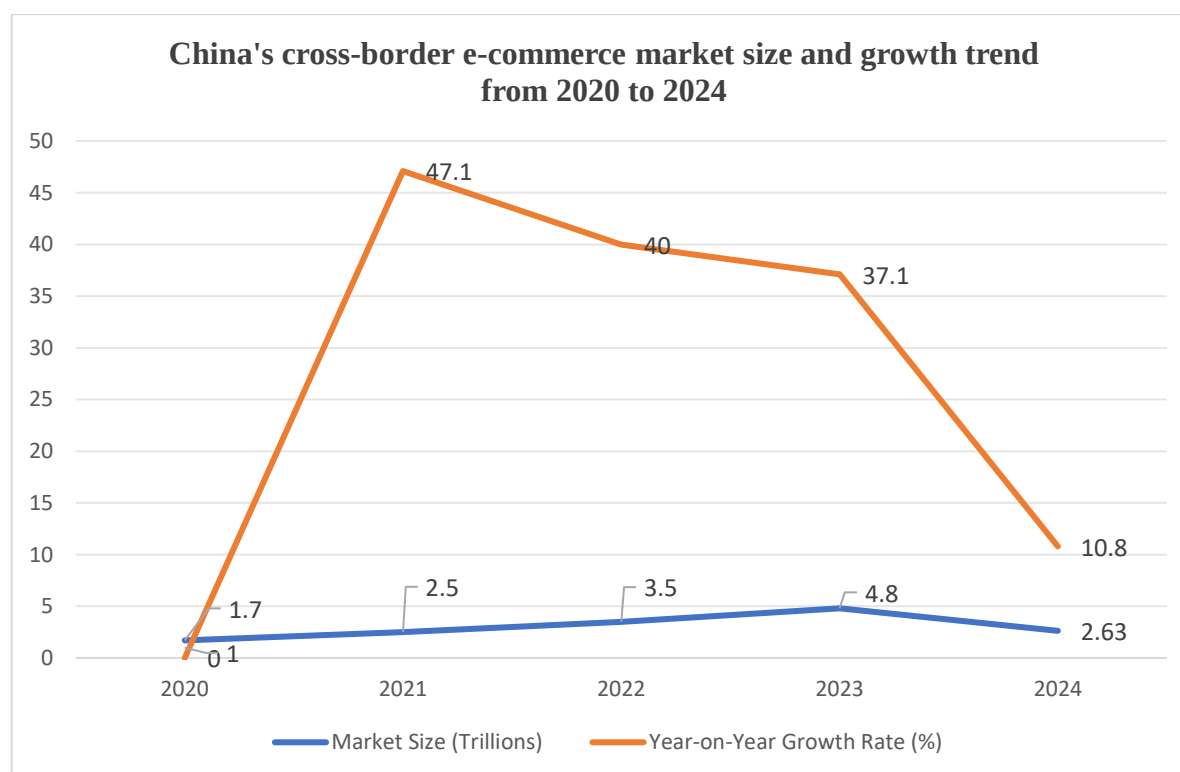


Figure 1.

Line chart of China's cross-border e-commerce market size and growth trend from 2020 to 2024.

Source: General Administration of Customs of the People's Republic of China.

1.1.2. Growth of Corporate Entities

As of 2024, the number of corporate entities engaged in cross-border e-commerce has exceeded 120,000. As of June 2024, the number of cross-border e-commerce enterprises registered with China Customs reached 78,811, an increase of 20.81% compared with the end of 2023. Qi Chacha data shows that the number of enterprise registrations has demonstrated a trend of sustained growth. As of November 11, 2024, the number of cross-border e-commerce-related enterprise registrations has reached 6,930, exceeding the total registrations for the entire year of 2023. By the end of 2024, 8,310 cross-border e-commerce-related enterprises have been registered, far surpassing the total registrations of the previous year. In the first 11 months of 2024 alone, 7,609 enterprises were registered, representing a 46.84% increase compared to the same period last year.

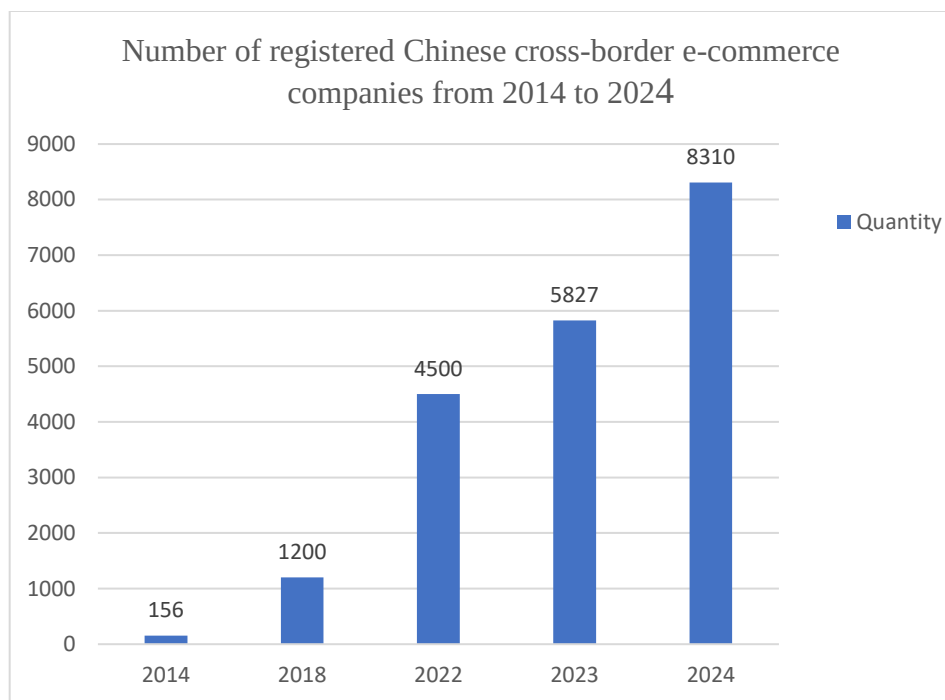


Figure 2.

Bar chart of the number of registered Chinese cross-border e-commerce companies from 2014 to 2024.

Source: Qichacha

1.1.3. Export Commodity Structure

China's cross-border e-commerce imports are in their infancy, but are growing rapidly. Cosmetics, skin care products, maternal and child products, luxury goods, trendy clothing, electronic consumer products, food, and health products are the mainstream commodities imported by cross-border e-commerce. In the first half of 2024, among China's cross-border e-commerce exports, clothing, shoes, bags, and jewelry accounted for 27.3%, mobile phones and other electronic products accounted for 14.4%, and home textiles accounted for 12.4%. Among imports, beauty and toiletries accounted for 28.8%, and fresh food accounted for 25.2%.

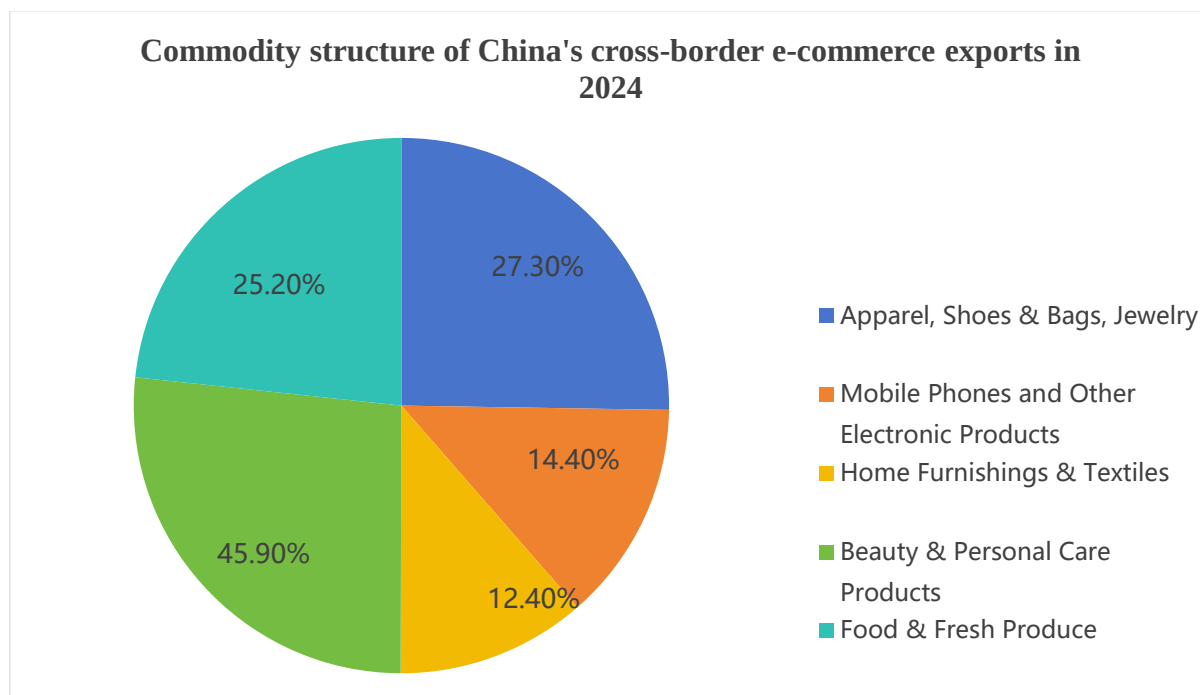


Figure 3.
Pie chart of China's cross-border e-commerce export commodity structure in 2024.
Source: General Administration of Customs of China.

1.1.4. Infrastructure Construction

The report released by the Cross-border E-commerce Sustainable Development Forum of the 2024 World Internet Conference indicates that 23 countries, including China, possess a favorable business environment and strong industrial competitiveness in the field of cross-border e-commerce. The development of this sector is considered to be in a relatively mature stage. As of the first quarter of 2024, there are over 120,000 cross-border e-commerce entities, more than 1,000 industrial parks dedicated to this sector, and over 2,500 overseas warehouses with a total area exceeding 30 million square meters. Among these warehouses, more than 1,800 are specifically dedicated to serving cross-border e-commerce, covering an area of more than 22 million square meters.

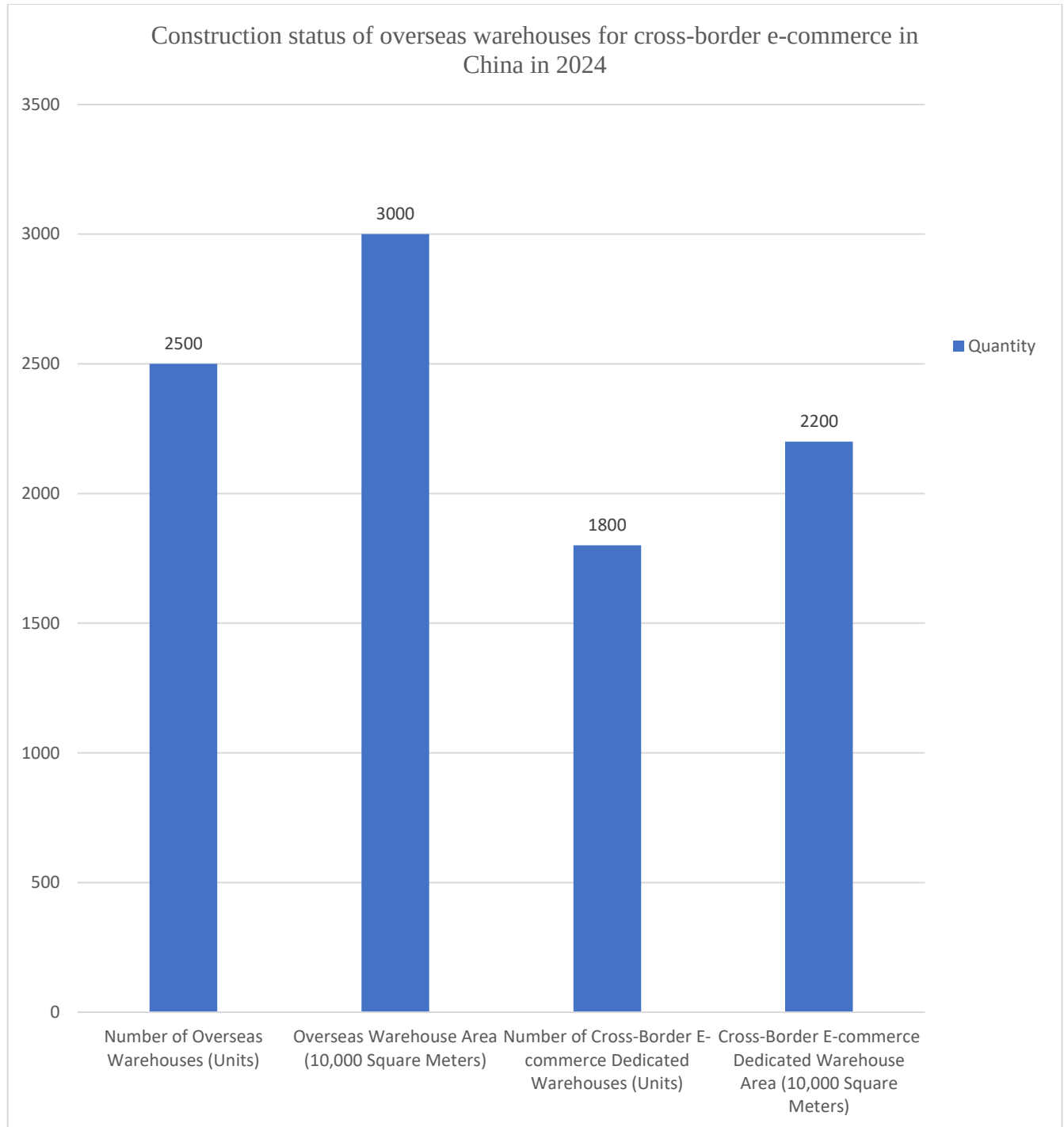


Figure 4.

Bar chart of the number and area of overseas warehouses for China's cross-border e-commerce in 2024.

Source: Ministry of Commerce.

In China's cross-border e-commerce sector, the competition landscape has been constantly evolving, from the early C2C platform Eachnet (later acquired by eBay) to Taobao (Alibaba), which became the industry leader with its low-price strategy and rich product variety, to the rise of platforms such as

JD.com and Pinduoduo. The market competition has become increasingly fierce. Although Taobao and its subsidiary brand Tmall still occupy a dominant position, the rapid growth of Pinduoduo and the steady development of JD.com have also brought significant pressure to Alibaba. Today, China's cross-border e-commerce industry has entered the era of global mass consumption. During the "Double Eleven" in 2024, the Alibaba platform attracted consumers from 217 countries and regions. These factors have jointly shaped the development pattern of China's cross-border e-commerce industry.

1.2. The Rise of Southeast Asian E-Commerce Market

1.2.1. Market Overview

In recent years, the Southeast Asian e-commerce market has experienced remarkable growth. According to the "2024 Southeast Asian E-commerce Report" released by Momentum Works, the total transaction volume of e-commerce platforms in the region reached US\$114.6 billion in 2023. From a market competition perspective, Shopee ranks first with a market share of 48%, followed by Lazada with 16.4%, and TikTok and Tokopedia both account for 14.2%, ranking third. It is noteworthy that the total transaction volume (GMV) of TikTok Shop has nearly quadrupled compared to 2022.

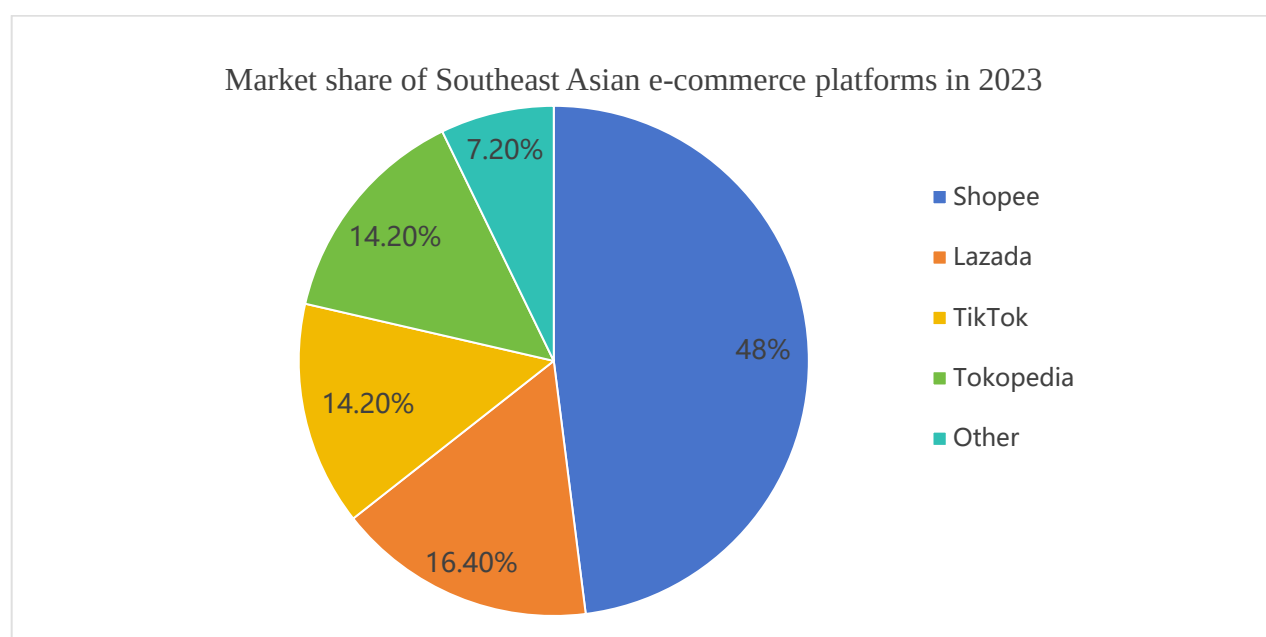


Figure 5.
Pie chart of Southeast Asian e-commerce platform market share in 2023.
Source: Momentum Works Ventures "2024 Southeast Asia E-commerce Report"

1.2.2. Market Development Forecasts by Country

According to the "2024 Southeast Asia E-commerce Report" and other related report data released by Momentum Works, the development trends of the e-commerce markets in the six Southeast Asian countries are different, and the scale forecasts vary.

(1) Indonesia: The e-commerce transaction volume in 2023 is approximately 454 trillion rupiah, and it is expected to reach 65 billion US dollars in 2024, representing an 11% increase from 2023. By 2030, it is projected to double to 130 billion US dollars.

(2) Thailand: The e-commerce market is worth 634 billion baht in 2023 and is expected to reach 26 billion U.S. dollars in 2024, with a growth rate of 19%. It is projected to exceed 60 billion U.S. dollars by 2030.

(3) Vietnam: The e-commerce market size will increase by 25% year-on-year to 20.5 billion U.S. dollars in 2023, and is expected to reach 36 billion U.S. dollars in 2024, with a compound annual growth rate of 16%; it is projected to reach 63 billion U.S. dollars in 2030.

(4) Malaysia: The e-commerce market is expected to reach US\$16 billion in 2024 and grow to US\$25 billion by 2030.

(5) Philippines: The e-commerce market is expected to be US\$21 billion in 2024 and may be between US\$35 billion and US\$45 billion in 2030.

(6) Singapore: The e-commerce market is expected to be US\$9 billion in 2024 and may reach US\$15 billion to US\$20 billion in 2030.

According to statistics from the Bureau of International Trade of the Ministry of Economic Affairs of Taiwan and the Customs Administration of the Ministry of Finance, Taiwan's cross-border e-commerce exports to Southeast Asia will reach NT\$30 billion (approximately US\$1 billion) in 2022, accounting for about 30% of Taiwan's total cross-border e-commerce exports. The main export commodities include electronic products (40%), machinery and equipment (20%), and textiles and apparel (15%), of which Singapore, Malaysia, and Vietnam are the top three export markets. The Ministry of Economic Affairs of Taiwan pointed out that with the advancement of the New Southbound Policy and the deepening of regional economic cooperation, Taiwan's cross-border e-commerce exports to Southeast Asia are expected to continue to grow.

1.2.3. Impact of the Global Economic and Trade Environment

In 2023, the total global export volume was US\$23.8 trillion, a decrease of 4.6% from the previous year. In the same year, China's total import and export volume was US\$5.94 trillion, with an export market share of 14.2% and an import market share of 10.6%. The World Trade Organization predicts that the global merchandise trade volume will increase by 2.6% in 2024 and 3.3% in 2025.

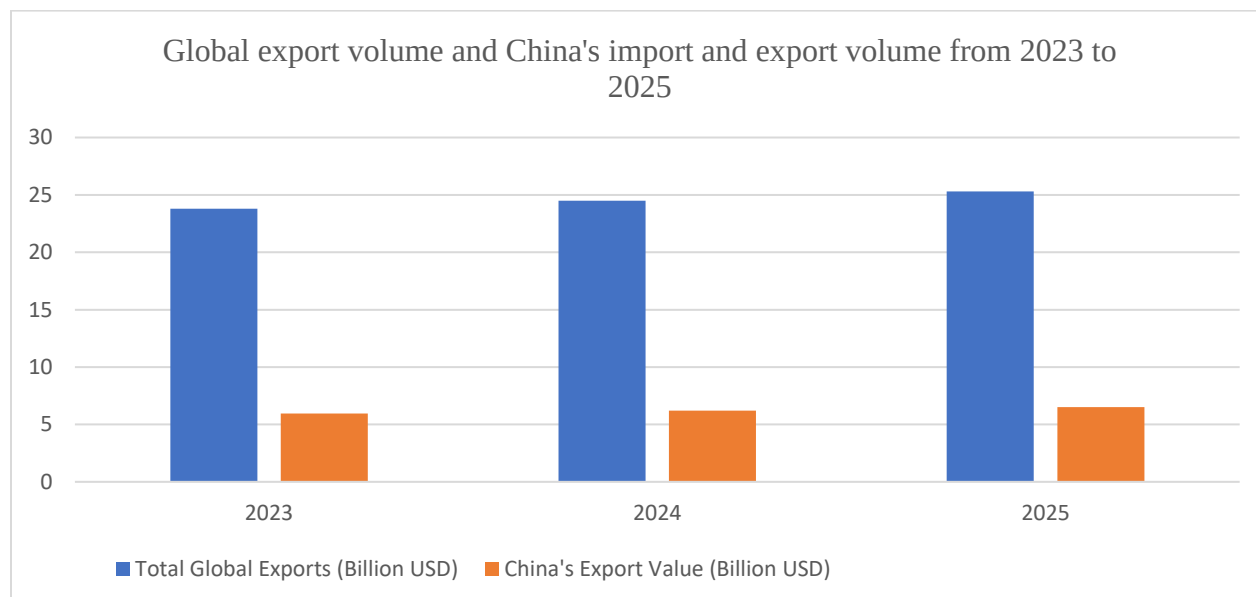


Figure 6.

Bar chart of global exports and China's imports and exports from 2023 to 2025.

Source: World Trade Organization (WTO).

In summary, under the background of the global economic and trade environment, from 2019 to 2023, although the share of China's cross-border e-commerce in the Southeast Asian market continues to grow rapidly, Southeast Asia, as a competitive and lucrative market, is also attractive to developed

countries such as Singapore, and the competition in this market is becoming increasingly fierce. For companies that hope to succeed in this growing market, using the Lanchester Movement Combat Theory Model to deeply analyze the competitive entry strategies of Chinese cross-border e-commerce companies in the Southeast Asian market is of great significance for companies to accurately grasp market opportunities and effectively enhance their competitiveness.

2. Research Motivation

Lanchester's laws, also known as Lanchester's laws, are an important combat simulation theory in combat operations research and mathematical tactics formed after World War II. The theory was created by the British engineer Frederick William Lanchester in 1914, before World War I.

Lanchester first proposed an experimental mathematical model of tactics, a mathematical differential equation that describes the dynamic changes of both sides in the battle. This equation reveals the dynamic changes of the strength of both sides in the battle through a mathematical model, including two forms: linear law and square law. The linear law is applicable to battle scenarios where the strength of both sides is close, while the square law is applicable to situations where the strength of one side far exceeds that of the other. This theory belongs to a deterministic mathematical model. It adopts the principle of mathematical deduction tactics and combines mathematics with military sports tactics. It is generally believed that it can describe the damage process of the battle between the two sides in a macroscopic way. It is usually used to optimize the deployment of combat capabilities and is a quantitative and scientific method often used in Western battle research.

The Lanchester equation was originally used in the military field to predict battle results and analyze troop consumption. However, with the development of the theory, its application scope has gradually expanded to business competition strategies, especially in evaluating competitiveness and market share strategies. In market competition strategies, the formulation and execution of traditional decisions often rely on the experience and judgment of managers, but this method is easily affected by the subjective factors of decision makers, resulting in increased decision-making risks. Therefore, this study adopts the "Lancaster Law" in corporate strategy and suggests that companies must accurately position the market, fully analyze the competitive environment, and carefully compare their own "combat power" with competitors. By quantifying the "combat power" and "resource allocation" in market competition, it helps companies to formulate competitive strategies more accurately. Based on the above theoretical strategies, combined with the particularity of the cross-border e-commerce industry, this study explores the competitive strategies of Taiwan's cross-border e-commerce in the Southeast Asian market. By quantitatively analyzing the market competition share, resource allocation efficiency, and dynamic changes of competitors, it aims to provide scientific decision-making support for enterprises, help them optimize strategies in a complex competitive environment, and improve decision-making quality and market competitiveness.

3. Literature Review

3.1. Trends in Cross-Border E-Commerce

According to the survey results of the "E-commerce Cloud Innovation Application and Basic Environment Construction Plan" of the Department of Commerce of the Ministry of Economic Affairs, the output value of Taiwan's e-commerce market in 2024 is approximately 2,101.9 billion yuan. Relevant forecasts indicate that by 2026, the scale of Taiwan's e-commerce market is expected to reach 2,316.7 billion yuan. With the continuous development of the e-commerce market and the ongoing expansion of online shopping, traditional capital flow payment methods can no longer meet the actual needs of consumers and sellers in transaction processing. After all, in various transaction processes, the buyer's fulfillment of the obligation to repay and the completion of the transaction through reasonable capital delivery are key links.

Table 1.
Comparison of e-commerce market size growth

Region	Year	Market size	Growth rate	Development
Southeast Asia	2020	35 billion USD	Expected to grow 5 times	Explosive expansion
China	2023	1.4 trillion USD (9.66 trillion RMB)	2 times growth in 2019	Large base, but still maintains a high growth rate
Taiwan(China)	2024	21,019 billion NT dollars	10.2% steady growth	Taiwan's growth is slow, but the e-commerce market continues to expand

Meanwhile, Southeast Asia is following in the footsteps of China and the United States and has also entered a golden stage of e-commerce development. Although online shopping currently accounts for only 1% of Southeast Asia's retail turnover, it is expected to grow at a rapid double-digit rate in the next four to five years. With a population of 600 million, twice the size of the United States, Southeast Asia is expected to become the world's third-largest e-commerce market in the future, second only to China and India, and may even surpass the United States.

Such a huge market potential has attracted many local, regional, and global e-commerce competitors to join in. In September 2024, Matahari Mall, an e-commerce advertising network established by Lippo Group, the second-largest conglomerate in Indonesia, publicly announced that it would challenge Lazada, the largest in the current Indonesian market, with the goal of becoming the "Alibaba" of Indonesia. At the same time, Alibaba's competitor JD.com also quietly entered the Indonesian market, further intensifying the competition in the Southeast Asian B2C e-commerce market.

In 2025, the Southeast Asian e-commerce market will be characterized by mutual alliances between enterprises. Starting from January this year, Thailand's local vertical e-commerce platform WhatsNew opened stores under the "MOXY" brand on competing platforms such as Lazada and Rakuten. Recently, the beauty website Luxola was acquired by the French luxury group LVMH.

However, fierce competition has also presented challenges to the B2C e-commerce sector in Southeast Asia. This year, some companies have failed in the competition. For example, Indonesian fashion retailer Paraplou closed down in October 2025, two years after opening, due to a lack of clear business focus and sufficient financial support. Additionally, in March this year, Singapore Post (SingPost) and Indonesia's largest mobile device retailer Trikomsel jointly launched an e-commerce brand in an attempt to further expand the e-commerce market and compete with Thai e-commerce solution company aCommerce. However, in December, Wolfgang Baier, president of Singapore Post, announced his resignation, adding many variables to the market competition.

Table 2.
Overview of Southeast Asian and global e-commerce brands.

No.	Brand	Main market	Business type	Current status
1	Alibaba	China, Southeast Asia, global	Comprehensive e-commerce (B2B, B2C, C2C)	Acquired Lazada to expand into the Southeast Asian market, facing competition from JD.com and MatahariMall.
2	JD.com	China, Southeast Asia	B2C e-commerce platform	Low-key entry into the Indonesian market, challenging Lazada and competing with Alibaba.
3	Lazada	Southeast Asia (Indonesia, Thailand, etc.)	Comprehensive e-commerce (B2C, C2C)	Acquired by Alibaba, becoming the largest e-commerce platform in Southeast Asia, but facing challenges from new competitors.
4	MatahariMall	Indonesia	B2C e-commerce platform	Founded by Indonesia's Lippo Group, aiming to become Indonesia's Alibaba, directly challenging Lazada.
5	WhatsNew (MOXY)	Thailand	Vertical e-commerce (fashion, beauty, etc.)	Opened stores on platforms such as Lazada and Rakuten to expand market influence.
6	Rakuten	Japan, Southeast Asia	Comprehensive e-commerce (B2B2C)	Once expanded into the Southeast Asian market and competed with Lazada, but its influence is currently weakening.
7	Luxola	Singapore, Southeast Asia	e-commerce (beauty)	Acquired by the French luxury group LVMH to enter the luxury beauty market.
8	LVMH	Global	beauty, fashion retail	Acquired Luxola to expand into the Southeast Asian market.
9	Paraplou	Indonesia	Fashion apparel e-commerce	Due to funding issues, it closed down in October 2015 and failed to survive in the Southeast Asian market.
10	SingPost (Singapore Post)	Singapore, Southeast Asia	Logistics, e-commerce solutions 決	Cooperated with Trikomsel to launch an e-commerce brand, but the business suffered a setback after the president resigned.
11	Trikomsel	Indonesia	Electronics retail	Participate in the e-commerce market and cooperate with SingPost. The market competition is fierce.
12	aCommerce	Thailand, Southeast Asia	E-commerce solutions	Mainly provides e-commerce infrastructure for brands and competes with SingPost.

3.2. The Lanchester Law and Its Application to Business Strategies

Lanchester [2], a British technical engineer and adviser to the British government was the designer of Britain's first automobile. In his analysis of the German-British War during World War I, Lanchester discovered a specific relationship between troop strength and attrition, leading to the formulation of "Lanchester's Law." The law states that "the one with the advantage in numbers loses relatively little and will win," so the Lanchester Law is also known as the "law of quantity," and its core meaning is that the greater the difference between the two sides in terms of quantity, the smaller the loss of the stronger.

Subsequently, Bernard Koopman, a German physicist and "father of operations research," further developed the Lanchester Law into the Lanchester Strategic Model and applied it to World War II, with remarkable results. In the 1960s, Edward W. Deming introduced this law to Japan (it can be seen that the application of Lanchester's Law in business originated in the United States). Later, scholar Nobuo Taoka collated that this principle was applied to sales strategy and became an important principle in the marketing of Japanese consumer culture, resulting in the complete Lanchester Law (also known as the "New Lanchester Strategy") in business applications [3]. In short, "Lanchester's Law" reveals the law of victory in competition and is a science.

The founder of Lanchester's Law, F.W. Lanchester, the great British aeronautical engineer, developed a keen interest in actual air combat data while studying propellers. He pondered the outcome of a battle between several planes against several planes, and this question prompted him to further

collect various ground combat data in order to find out if there was a pattern between the ratio of forces and the amount of damage.

Among the many successful cases of the Lan-style strategy, the regional strategy of consumer products occupies a central position. For example, the establishment of territorial jurisdictions or the determination of the size of jurisdictions should be used as a starting step, and then gradually expanded to the scope of application. However, in the field of means of production, the application of this law may be more restricted. In general, there are many examples of successful applications of the Lanchester Law in consumer goods, general consumer durables, life insurance, and finance. The target value of market share is the key indicator of the blue-style strategy, such as what percentage of the relative safety circle of market share should be reached, and how much percent of the market share must be required to achieve exclusivity, all of which involve the target value of market share [4].

Globally, the Lanchester Law has been most successfully applied to geographical strategy. For product channel strategy, product strategy, and other fields, users need to have a deeper understanding to use it effectively. Additionally, issues such as determining the number of absolute safety conditions for chain stores in a region require not only considerable innovation ability but also the company's own conditions for the law to be effective. The Lanchester Law can be applied to many aspects such as marketing planning, product planning, and product access, but it must be quite original in practical application. Without detailed and in-depth research, it is difficult to apply it flexibly in practice. Whether it is the sales process or the competition between enterprises, the competition for market share is almost everywhere. The application of the Lanchester Law to corporate competition mainly focuses on market share issues, such as exploring strategies to increase market share. Therefore, Lanchester's Law can be seen as a science about occupancy.

The Lanchester Law emphasizes the advantage of quantity, and in the context of business scenarios, this philosophy is reflected in the focus on "market share" advantage. This principle considers the "target value" and "market type" of market share as important reference points to help enterprises clarify the position of their brand products in the market and the industrial ecological environment in which they operate, thereby enabling the formulation of more optimal business strategies.

At the level of business strategy, the "strategy of the strong" usually corresponds to the strategic model of a large company. Large companies have relatively large human resources (analogous to the number of troops), and by adopting long-distance operations or large-scale combat strategies, they can fully leverage their manpower advantages and achieve economies of scale, that is, the so-called "big Evergrande." Therefore, the concentration of superior resources has become the key factor that determines the commercial success or failure of large companies.

In contrast, the "strategy of the weak" applies to small companies. Due to the relative lack of manpower (number of troops) in small companies, if they do not adopt a precise strategy of close combat or one-on-one, they are often at a disadvantage in the competition. In this case, improving the effectiveness of "weapons" (which can be compared to key competitive factors such as product characteristics and technology) becomes the key to changing the tide of battle.

Regarding the "target value" of market share, the Lanchester Law divides market share into three different levels: upper, middle, and lower, and assigns corresponding target values, which are as follows:

3.2.1. Exclusive Conditions: High Market Share Target Value

When the company's market share reaches the "upper target value," it indicates that the company has an absolute market advantage. However, this high level of market control can lead to a complacent attitude toward customer needs. Therefore, enterprises at this stage should make full use of the existing mainstream advantages to further consolidate their position and strive for a higher monopoly status.

3.2.2. Safety Range: Medium Market Share Target

If a company's market share reaches a "stable target value," it indicates that the company is in a relatively stable market position (at least not to suffer a fiasco). In this case, enterprises should be

aggressive, strive for a higher market share, and aim to surpass other brands to become the mainstream force in the market.

3.2.3. Minimum Criteria: Low Market Share Target

Once a company's market share reaches the "lower target value," it indicates that the product is surrounded by many strong competitors. Even if the company temporarily occupies the leading position in the market under the condition of low market share, its leading position is also precarious, and it may be replaced by other competitors at any time, and the position of the first brand is extremely unstable.

4. The Analysis Method of Enterprise Competition Based On Lanchester's Law.

This study uses the Lanchester Law to analyze the overall competitiveness of enterprises and deeply analyzes the competitive relationship between competitors by distinguishing the strengths and weaknesses of competitors, thereby clarifying the competitive situation of the enterprises themselves. The specific analysis methods are as follows:

4.1. Lanchester Law Range Calculation for The Southeast Asian Market from Taiwan, China.

Lanchester's Law Range = Global Market Share of Southeast Asian Countries / Global Market Share of E-commerce in Taiwan, China

This indicator is used to measure the relative competition between e-commerce in Taiwan and Southeast Asian countries at the global market level, reflecting the relative position of e-commerce in Taiwan in the face of competition in Southeast Asian markets.

4.2. Formula for Calculating Market Share

Market share = own e-commerce output value / global e-commerce output value

This formula clarifies the calculation method of the company's market share, and through this formula, it can intuitively understand the company's share in the global e-commerce market, and provide basic data for further analysis of the company's market position.

4.3. Assessment of the Potential of E-Commerce in Taiwan, China in the Southeast Asian Market.

The potential of e-commerce in Taiwan = e-commerce market share in Taiwan / e-commerce market share in Southeast Asian countries.

This indicator aims to evaluate the potential development space of e-commerce in Taiwan and China within the Southeast Asian market, providing a reference for e-commerce strategies in Taiwan for the Southeast Asian market by comparing the market share of e-commerce in Taiwan, China, and Southeast Asian countries.

4.4. Evaluate The Way the Elements are Evaluated.

4.4.1. Lanchester - Strong Strategy

Based on Lanchester's Law, the Strongman strategy calculates its attack power as follows: Attack Power = Number of Troops² × Weapon Performance. In this model, "weapons" are analogous to commodities, "tactics" correspond to business methods, and "battlefields" are equated to specific regions.

This strategy emphasizes that large companies can use their size advantage (number of troops) to amplify their attack effectiveness through the squared effect, while focusing on improving the performance of goods (weapon performance) in order to gain an advantage in market competition.

4.4.2. Lanchester - Underdog Strategy

Under Lanchester's Law of the Weak Strategy, Attack Power is calculated as follows: Attack Power = Number of Troops $\times$ Weapon Performance. In the same way, "weapons" represent commodities, "tactics" are the mode of business, and "battlefields" are specific areas.

For small companies, due to the limited number of personnel, it is more necessary to focus on improving the performance of products (commodity competitiveness) and compete in specific markets (battlefields) through precise business strategies (tactics) to enhance their competitiveness.

5. Empirical Research and Analysis of Results

5.1. The Development Trend of Global E-Commerce

According to Euromonitor's 2024 report, world e-commerce B2C retail sales will be approximately £1,030 billion in 2024, with an annual growth rate of about 20%. By the end of 2025, these sales are expected to increase to £1,584 billion, although the annual growth rate has slightly decreased to approximately 16%. Overall, global e-commerce is projected to continue growing at a double-digit compound annual growth rate through 2018 and reach £2.5 trillion within three years. The widespread use of mobile devices, the popularisation of the Internet, and active government investments are driving rapid expansion of the global e-commerce retail market. In many regions, e-commerce sales account for more than 8% of the overall retail market, making it a significant component of the retail industry.

Well-known consulting firm AT. Kearney estimated the global e-commerce market landscape in 2015 based on statistics from eMarketer, the International Telecommunication Union, and the International Monetary Fund. The report shows that in the annual online retail sector, the United States in North America, the five major European countries (Germany, France, the United Kingdom, Italy, Spain), Chinese mainland, and Japan in Asia accounted for three-quarters of the global retail share, with respective shares of 32%, 19%, 15%, and 10%. Among them, the ASEAN-6 countries account for a relatively small proportion of less than 1%, but their growth momentum is strong [5].

5.2. Analysis of the ASEAN E-Commerce Market

According to data from Klaviyo [6] the total population of the six ASEAN-6 countries exceeds 700 million, of which 99 million are online, and the online retail market size is about \$11 billion. Driven by the vigorous strengthening of infrastructure construction by governments, the widespread use of mobile phone networks, and the active deployment of international e-commerce enterprises, ASEAN is expected to become one of the fastest-growing regions in the world. Currently, Singapore's e-commerce market size is approximately US\$1.7 billion, making it the largest market in ASEAN. Malaysia and Indonesia each have US\$1.3 billion, making up ASEAN's three largest markets. Among the ASEAN-6 countries, Singapore and Malaysia have a relatively high proportion of online users, both accounting for more than 65% of the total population, and the development of e-commerce is relatively mature. Other countries have a lower proportion of people online, so they have greater growth potential, which is the main reason why companies from around the world are attracting to enter the region to seize the market. The size of the e-commerce market in the six ASEAN countries is as follows: Malaysia US\$1.3 billion, Singapore US\$1.7 billion, Indonesia US\$1.3 billion, Philippines US\$1 billion, Vietnam US\$800 million, and Thailand US\$900 million [7].

At present, the four major online platforms have a significant leading position in the ASEAN market, including: (a) Lazada, a local leader in ASEAN; (b) Amazon, the world's No. 1 B2C website; (c) Alibaba.com, AliExpress, and Taobao, which are owned by Alibaba Group, the No. 1 company in Chinese mainland; (d) the U.S. C2C website eBay and its Qoo10 network, a joint venture with South Korea's Gmarket. Among them, except for Lazada, which focuses on the local market and is growing, the others are multinational platforms or reinvestment companies based in the United States or Chinese mainland.

5.3. *The Development of the E-Commerce Market in Taiwan, China*

According to research by the Institute for Information Technology's Institute of Industrial Information, Taiwan's e-commerce market will exceed NT\$1 trillion (US\$34.5 billion) from 2025 and grow steadily at a rate of more than 10%. The market size is expected to grow at an 11% rate in 2017 and reach NT\$1,251.5 billion. The main drivers for the growth of Taiwan's e-commerce market include the increasing market share of handheld mobile devices such as mobile phones, the continuous expansion of online e-commerce product categories, and the gradual integration of physical and virtual channels. These factors are driving a thriving virtual opportunity trading environment for storefront-free shopping. Currently, Taiwan's e-commerce accounts for more than 11% of the overall retail industry, and its popularity surpasses that of mainland China and the United States.

5.4. *The Mode of Entry into the Southeast Asian Market by Taiwanese Manufacturers and Related Analysis*

There are five models that Taiwanese manufacturers can adopt when entering the global B2C e-commerce retail market in Southeast Asia. In the decision-making process, enterprises need to consider the following two key factors: first, whether to set up an online store in China or overseas; second, whether to establish an online store platform or choose its own official website or a third-party trading platform.

If a company prefers to conduct sales activities through its own official website and does not link to other platforms such as Amazon, then the official website must have multilingual text capabilities to meet the needs of consumers in different regions, as well as shopping cart and payment collection functions. Specifically, the website needs to be connected to mainstream cash flow tools such as credit cards, PayPal, and Alipay to ensure a smooth payment process. In addition, it is necessary to build an ERP information system that is connected with warehouse, international logistics, and supply chain systems to ensure the efficient operation of commodity supply, warehousing, and logistics distribution. On the contrary, if a company chooses to sell on an existing mature platform (such as Amazon), the platform itself usually provides a relatively complete basic system. Each platform system will guide enterprises to use relevant management background and ERP tools, which reduces the operational threshold and technical difficulty of enterprises.

5.4.1. *Market Share Calculation*

Market share is an important indicator for measuring a company's competitive position in the market. Its calculation formula is: Market share = e-commerce output value / global e-commerce output value. Based on this formula, the market share of relevant regions is calculated as follows:

Taiwan's global e-commerce market share: calculated to be $345 / 9940 = 3.47\%$.

The e-commerce market size of the six ASEAN countries is US\$7 billion, and its global market share is $70 / 9940 = 0.7\%$. Among them, Malaysia's global e-commerce market share is $13 / 9940 = 0.13\%$; Singapore's global e-commerce market share is $17 / 9940 = 0.17\%$; Indonesia's global e-commerce market share is $13 / 9940 = 0.13\%$; the Philippines' global e-commerce market share is $10 / 9940 = 0.1\%$; Vietnam's global e-commerce market share is $8 / 9940 = 0.08\%$; Thailand's global e-commerce market share is $9 / 9940 = 0.09\%$.

These data will help Taiwanese manufacturers to more clearly understand their position in the global e-commerce market and the competitive situation in each target market, thereby providing a strong basis for them to formulate market strategies.

Table 3.
Market share calculation

Area	E-commerce market size (US\$ billion)	Total scale of global e-commerce (US\$ billion)	Calculation formula	Global e-commerce market share (%)
Taiwan, China	345	9940	345/9940	3.47
ASEAN six countries	70	9940	70/9940	0.70
Malaysia	13	9940	13/9940	0.13
Singapore	17	9940	17/9940	0.17
Indonesia	13	9940	13/9940	0.13
Philippines	10	9940	10/9940	0.10
Vietnam	8	9940	8/9940	0.08
Thailand	9	9940	9/9940	0.09

5.4.2. Range Calculation Based on Lanchester's Law

The range calculation in the Lanchester Law can reflect the competitive situation of different economies in the target market to a certain extent. In this study, the calculation formula of the range of the Lanchester Law of a specific region to the Southeast Asian market is: the range of the Lanchester Law of a specific region to the Southeast Asian market = the global market share of Southeast Asian countries / the global market share of e-commerce in the region.

According to the above formula, the specific calculations for each region are as follows:

The Lanchester Rule range for the Southeast Asian market in Taiwan, China: calculated to be 0.7% / 3.47% $\approx$ 0.20.

The Lanchester Rule range for the Southeast Asian market in the United States: calculated to be 0.7% / 32% $\approx$ 0.021.

The Lanchester Rule range for the Southeast Asian market in the European Union: obtained to be 0.7% / 19% $\approx$ 0.037.

The Lanchester Rule range for the Southeast Asian market in mainland China is calculated to be approximately 0.7% / 15% $\approx$ 0.047.

Judging from the comparison of range calculation results, Taiwan's relative competitiveness in the Southeast Asian market is weaker than that of other regions, and its competitiveness is about 1/3 - 1/10 of that of other regions. This means that Taiwan's e-commerce may face more intense competitive challenges when expanding into the Southeast Asian market, and needs to adopt more precise and effective market strategies to enhance its competitiveness.

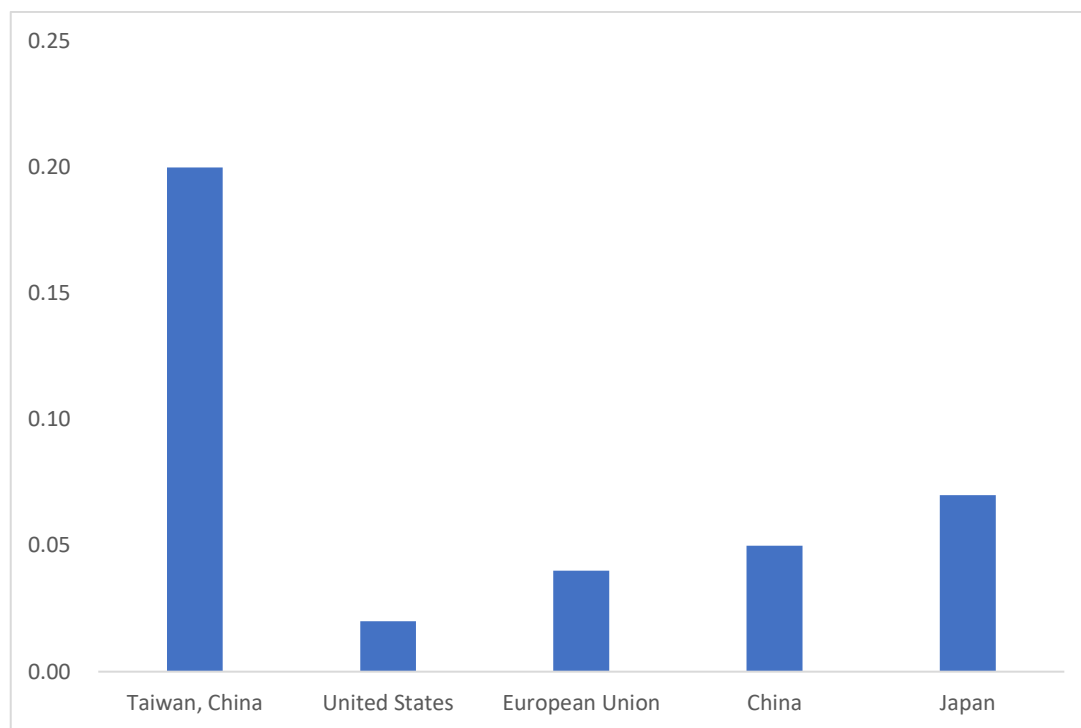


Figure 7.
Comparison of Lanchester ranges in different countries.

5.4.3. Analysis of the potential of Taiwan's e-commerce in the Southeast Asian market

When evaluating the development prospects of Taiwan's e-commerce in the Southeast Asian market, quantitative analysis can be performed by calculating its potential to occupy the Southeast Asian market. The calculation formula for this potential is: Taiwan's e-commerce potential to occupy the Southeast Asian market = Taiwan's e-commerce market share / Southeast Asian countries' e-commerce market share.

It is known that Taiwan's global e-commerce market share is calculated as $345 / 9940 = 3.47\%$. Based on this, the market potential of Taiwan's e-commerce in various countries and regions within Southeast Asia is further analyzed and estimated accordingly.

Taiwan's potential for the overall e-commerce market of the six ASEAN countries is $3.47 / 0.7 \approx 4.957$.

Taiwan's potential for the global e-commerce market of Malaysia is $3.47 / 0.13 \approx 26.69$.

Taiwan's potential for the global e-commerce market of Singapore is $3.47 / 0.17 \approx 20.41$.

Taiwan's potential for the global e-commerce market of Indonesia is $3.47 / 0.13 \approx 26.69$.

Taiwan's potential for the global e-commerce market of the Philippines is $3.47 / 0.1 = 34.7$.

Taiwan's potential for the global e-commerce market of Vietnam is $3.47 / 0.08 = 43.37$.

Taiwan's potential to compete for Thailand's global e-commerce market is $3.47 / 0.09 \approx 38.55$.

Based on the above calculation results, Vietnam, Thailand, and the Philippines rank in the top three in Taiwan's ranking of e-commerce market potential in the six ASEAN countries. This shows that Taiwan's e-commerce has relatively high potential opportunities in market expansion in these three countries, but at the same time, it is also necessary to fully consider the actual situation of the local market, the competitive situation, and policies and regulations in order to formulate a practical market strategy.

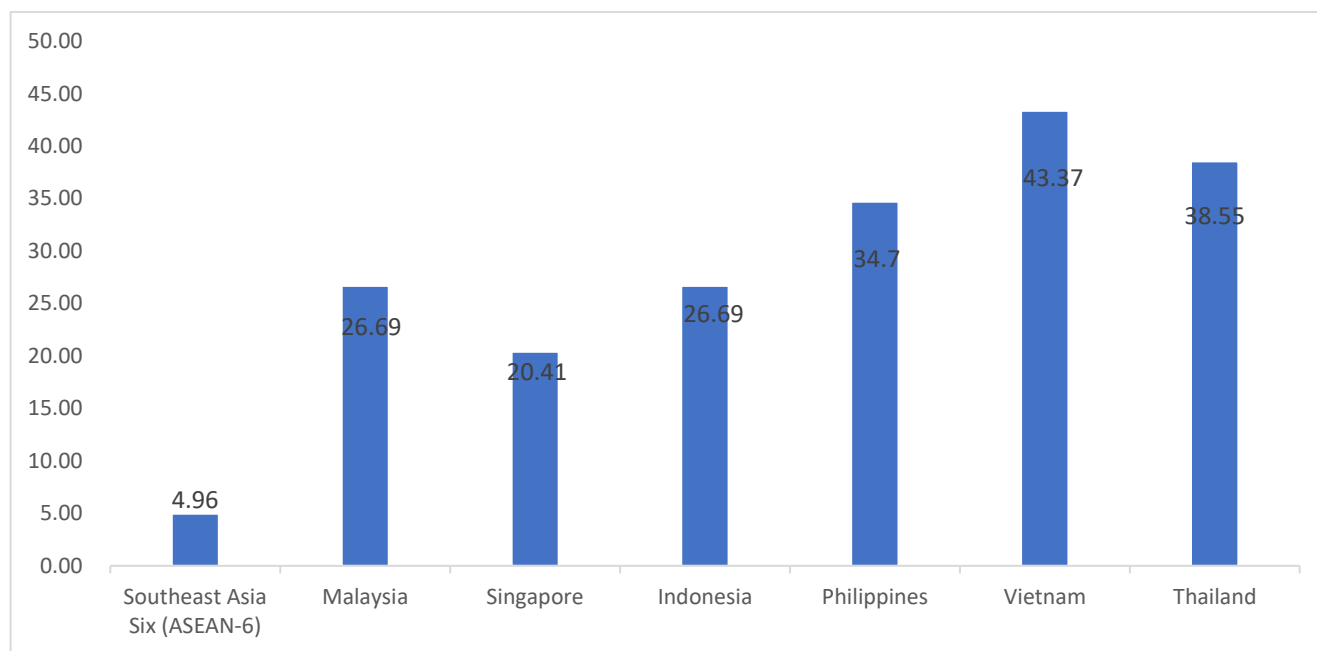


Figure 8.
Market potential in different regions.

6. Conclusion and Recommendations

This study employs the Lanchester sports combat theory model to analyze the competitive entry strategy of Taiwan's cross-border e-commerce in the Southeast Asian market. The results indicate that Taiwan's Lanchester Law range for this market is 0.20, suggesting that Taiwan's competitiveness is 3 to 10 times lower than that of other regions. Therefore, it is essential to develop targeted strategies when entering this market.

6.1. Analysis of Southeast Asian Market Potential

The e-commerce market size of the six ASEAN countries is approximately 7 billion US dollars, accounting for 0.7% of the global e-commerce market. Based on Taiwan's global market share of 3.47%, its potential market share in the ASEAN market could reach 4.957 times. This data clearly indicates that Taiwanese enterprises have significant opportunities for expansion in the ASEAN market. Further analysis of each country's market potential reveals that Vietnam (43.37 times), Thailand (38.55 times), the Philippines (34.7 times), Malaysia (26.69 times), Indonesia (26.69 times), and Singapore (20.41 times) possess the highest potential. It is evident that Vietnam, Thailand, and the Philippines are the top three countries with the most substantial potential for Taiwan's cross-border e-commerce to penetrate the Southeast Asian market.

6.2. Competitive Challenges

Compared with the Chinese mainland, Japan, and the European and American markets, Taiwan's e-commerce faces many challenges in terms of capital, technology, and supply chain integration. For example, although Taiwan's semiconductor companies have certain competitiveness in terms of global market size and supply chain efficiency, they are still limited in overall market expansion and international supply chain integration. This situation is also reflected in Taiwan's e-commerce industry, which has weaker supply chain integration capabilities than Alibaba and JD.com in mainland China, and Rakuten in Japan. Affected by the stability of the supply chain, Taiwan's companies find it difficult to

compete with Shopee and Lazada in the Southeast Asian market in terms of cross-border logistics efficiency, and are at a disadvantage in terms of fast delivery and local warehousing networks.

In addition, social e-commerce and group buying models (Facebook Group Buying) have developed rapidly in the Southeast Asian market in recent years. Taiwan's social e-commerce mainly relies on the Facebook group shopping (Group Buying) model. Although it has achieved certain success in Taiwan, its influence in the Southeast Asian market is limited. In comparison, the social e-commerce ecosystem in the Southeast Asian market is more dependent on Shopee Live, TikTok Shop, and WhatsApp Business tools, which undoubtedly bring additional adaptation difficulties for Taiwan's e-commerce to enter the market.

6.3. Entry Strategies and Recommendations

Supply chain optimization and local warehousing layout: To meet the challenges of supply chain integration, Taiwan e-commerce companies should adopt a strategy of cooperating with local third-party logistics (3PL) and warehousing service providers. For example, they can establish long-term partnerships with local logistics giants in Southeast Asia, such as J&T Express, Ninja Van, and Shopee Logistics, to improve order fulfillment efficiency. In addition, Taiwan companies can learn from Alibaba's local warehouse model in Lazada and set up regional warehousing centers in the Southeast Asian market to optimize delivery times and reduce cross-border transportation costs.

Enhance brand influence with the help of social e-commerce models: Consumers in the Southeast Asian market prefer live streaming, short video e-commerce, and social group purchases. Although the Facebook crowd purchase model has achieved certain results in the Taiwanese e-commerce market, the Southeast Asian market prefers TikTok, Instagram, and WhatsApp Business models. Therefore, when Taiwanese e-commerce enters the Southeast Asian market, it is necessary to integrate social e-commerce into the marketing strategy. The specific measures are as follows: (a) Carry out live marketing through TikTok Shop, Shopee Live, and Facebook Live; (b) Cooperate with local KOLs (key opinion leaders) in Southeast Asia to increase brand awareness; (c) Use WhatsApp Business API for personalized customer interaction to improve conversion rates.

Differentiated product positioning: Given the fierce competition among local brands in the Southeast Asian market, Taiwan e-commerce companies should avoid direct competition with Shopee and Lazada in the mass consumer goods market, and instead focus on high-end market segments (such as beauty products, health products, and technology accessories), and use Taiwan's brand image to differentiate their positioning. For example, they can promote Taiwan's high-end skincare brands in Vietnam and Thailand, promote Taiwan's health foods in Indonesia and the Philippines, and deploy Taiwan's high-end electronic products in Singapore.

Breaking through payment and regulatory barriers: The fragmentation of payment methods in Southeast Asia remains a significant obstacle to market entry. Taiwan e-commerce companies should collaborate with leading payment platforms in Southeast Asia, such as GrabPay, Gcash, Dana, and ShopeePay, to offer diversified payment options and build consumer trust. Additionally, they must closely monitor cross-border e-commerce regulations across different countries to ensure compliance and mitigate policy risks.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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