

The Relationship between the International Situation and the Share Prices of Companies Related to the Shipping Industry

Fankun Zeng*

School of Finance, Macau University of Science and Technology, Macao, 999078, China

**Corresponding Author.*

Abstract: Since the outbreak of the novel coronavirus pneumonia in 2019, the instability of the world has continued to increase. The Russia-Ukraine conflict that broke out in 2022 and the Palestinian-Israeli conflict that broke out in 2023 have all dealt a huge blow to the business of companies related to the shipping and aviation industry, and the stock price is a barometer that can reflect the business situation, and the fluctuations in the stock price often indicate changes in the company's business activities. At the macroeconomic level, changes and implementation of government economic policies often affect the business activities of related companies, which ultimately affect the company's stock price.

Based on the thesis that the superstructure in Marxist philosophy will react to the economic foundation, this paper selects the four major events of the Russia-Ukraine conflict, the new crown epidemic, and the U.S. election, and uses the multi-case analysis method to analyze the changes in the business activities of related companies in China, the United States and the European Union, and finally analyzes their stock price changes. to explore the correlation analysis of international events on the stock price changes of related companies.

Keywords: International Events; Shipping Company; Stock Prices; Correlation Analysis; Multi-Case Analysis

1. Prolegomenon

1.1 Background and Implications

1.1.1 Background

Since 2020, international events such as the COVID-19 pandemic, the Russia-Ukraine conflict (2022), and the Israeli-Palestinian conflict (2023) have caused fluctuations in the global economy and financial markets. Based on

Marx's theory that the economic base determines the superstructure, the relationship between international events, macroeconomic policies, and corporate stock prices has attracted much attention. For example, the pandemic caused China's GDP growth to be lower than 3.5% in 2020 and 2022, and the US's negative growth of -2% in 2020. Trump's election in 2024 foreshadows economic instability. The shipping industry has benefited from globalization and has supported international trade together with the aviation industry, but changes in the world situation in the post-epidemic era have led to drastic fluctuations in the stock prices of related companies. Studying the correlation between international events and stock prices is crucial to understanding economic dynamics.

1.1.2 Research implications

International events (such as the COVID-19 pandemic and the conflict between Russia and Ukraine) have triggered fluctuations in the global economy and financial markets, directly affecting the operating conditions and stock price performance of shipping and aviation-related companies. At the same time, macroeconomic policy adjustments in various countries have also significantly affected the market, which in turn affected corporate profits and investment value. In-depth research on the relationship between international events, macroeconomic policies and stock prices can provide investors and decision makers with decision-making and risk management strategies. Academically, analyzing the complex relationship between these factors can help reveal the operating mechanism of financial markets and deepen understanding of the global economic landscape and political risks.

1.2 Literature Review

In this study, in the context of the unstable international situation and the continuous measures taken by various countries, the use of multi-case analysis and volatility methods for

shipping and aviation companies and industries is studied, and the relevant literature is comprehensively elaborated from the following aspects. Li Liangang and Hu Xiaohui In view of the unprecedented impact of the new crown epidemic on the regional economy, in view of the response and adaptation of the regional economy under the background of the impact of the new crown epidemic, from the perspective of resistance, this paper measures the resilience of China's provincial economy, analyzes the influencing factors that cause the temporal and spatial differences in economic resilience, and obtains that there are differences and complexities in regional economic resilience in different dimensions, the industrial structure attribute has a significant impact on regional economic resilience, and the government's regulatory ability has a significant role in promoting resilience. External dependence is conducive to the outcome of the regional economy's active response to the impact of the epidemic [1]. Tatjana Stanivuk, Branko Lalić, Zvonimir Amižić draw conclusions from the current Russia-Ukraine conflict, from the perspective of their overall assessment of the shipping industry, using the methods of Volatility and Value at Risk, to conclude that the devastating impact of the war on the marine sector will not only affect the global economy, but also human health and quality of life. Therefore, it is a good basis for further research conclusions [2]. Zhang Mengxia and Jiang Guohai focused on the mechanism of the government's short-term consumption stimulus policy on economic recovery, selected six typical countries as the research object, and used the multi-case study method to conduct a multi-case comparative study between developed and developing countries. It is concluded that while improving the consumption power of low- and middle-income people, the tax reform should be promoted. Improve the mechanism for the issuance of consumption vouchers, and fully consider the impact of people's consumption and savings habits on specific forms of subsidies; Improve the labor market mechanism, and effectively play the positive role of scale-driven employment and technology-driven employment in market development; Establish an early warning and prevention mechanism for government management, so that the government's short-term consumption stimulus policy is more

forward-looking [3].

The existing research mainly focuses on the impact of the Russia-Ukraine conflict and the new crown pneumonia epidemic on the company's stock price and economy, using multi-case analysis, value risk, volatility and other methods. However, there is little research on specific companies and industries, so the research is forward-looking.

1.3 The Research Content and Methodology of this Paper

1.3.1 Outline of research

Chapter 1, Introduction: A brief introduction to the background of the article. Industry background and research significance, and a brief analysis of domestic and foreign literature review.

Chapter 2, Overview of Related Concepts and Theories: This chapter will briefly introduce the theory of correlation analysis and describe the importance and role of the multi-case analysis method.

Chapter 3 provides a brief introduction to major events and the business activities of companies in the countries concerned. This chapter will briefly introduce the three major international events of the new crown epidemic, the Russia-Ukraine conflict and the election of Donald Trump, analyze the global political and economic environment in the current context, and explain their impact on the shipping and aviation industry. The changes in the business of related companies in China, the United States and Europe are selected, and the stock prices of representative companies are selected for analysis.

Chapter 4 examines the correlation changes in stock prices in the event of adverse factors such as wars and epidemics. This chapter will draw conclusions based on stock price data from 2020 to 2024 (2023) to analyze the stock price movements of companies in various countries at different times in the context of the pandemic and war, and to prove the correlation of each event to the related stocks of shipping airlines in different regions.

Chapter 5. Summarizes the Content of the Article and Makes Recommendations. This Paper Summarizes the Article and Makes Suggestions to Deal with the Occurrence of International Emergencies , as shown in Figure 1.

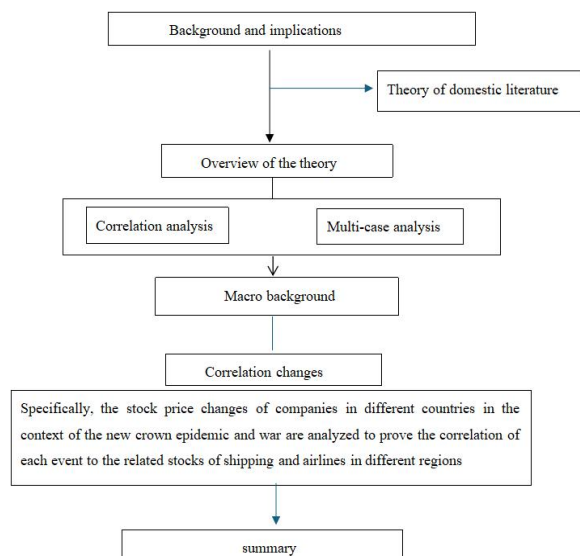


Figure 1. The Content and Steps of the Research

1.3.2 The research methodology of this paper

1) Multi-case analysis method: Collect data by finding multiple cases for horizontal and vertical analysis and provide a broader perspective for research.

2) Correlation analysis: In this paper, we will select the simplest correlation coefficient analysis, the Pearson correlation coefficient, to measure the relationship between stock price changes and events and conduct a significant test to achieve the research goal.

1.4 Subsections of This Chapter

This chapter briefly introduces the background and significance of the topic and provides an overview of the existing relevant research at home and abroad, and finds that there is little analysis of the impact of international events on stock prices after 2020, which proves that the research is forward-looking and can better optimize the strategies of shipping airlines. Finally, the research content of the paper and the research methods used in the paper are summarized, including the multi-case analysis method, the Pearson correlation coefficient and the significance test in the correlation analysis method.

2. An Overview of Relevant Concepts and Theories

This chapter will introduce multiple case studies, correlation analysis, and then describe in detail methods such as Pearson's coefficient and significance test, and the airline i.e. stock theory.

2.1 Overview of Concepts and Theories

2.1.1 Multi-case Analysis

The multi-case analysis method is to reveal the common laws and different differences behind the systematic analysis of multiple cases, through horizontal and vertical analysis. It provides a broader perspective than a separate case study, making the analysis actionable.

2.1.2 Correlation Analysis

Correlation analysis is a statistical method used to measure the correlation of data, which is widely used in the financial field to study the relationship between stock prices and macroeconomic events or indicators, helping investors understand market dynamics and formulate more effective investment strategies.

2.1.3 Pearson Correlation Coefficient

The Pearson correlation coefficient is one of the simplest methods of correlation analysis and was proposed by Carl Pearson from Francis Galton in the 1880s. The formula is as follows:

$$r = \frac{\sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^n (X_i - \bar{X})^2} \sqrt{\sum_{i=1}^n (Y_i - \bar{Y})^2}} \quad (1)$$

$$\rho_{X,Y} = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y} = \frac{E[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y} \quad (2)$$

2.1.4 Significance Analysis

Significance analysis is used to determine whether the observed data results are statistically significant under hypothetical conditions. Helps assess whether observed effects (e.g., differences, associations) may be caused by random factors or reflect real phenomena.

2.1.5 Shipping Companies

The shipping and aviation industry is one of the main modes of transportation for international trade, and listed shipping and aviation companies are generally regarded as one of the important indicators of global economic growth.

2.1.6 Factors influencing the share price of a shipping airline

The first is the international political landscape, where a country's policies and government stability can have a significant impact on the business of the company in question, which in turn affects the company's stock price. Conducting activities in a more stable country will result in more stable business and stock prices, and good policy advantages will also help to conduct business. The second is international economy and trade. In the current globalization, cargo transportation, transnational

tourism need the support of international shipping and airlines, so changes in global economy and trade will affect the company's business and stock price. Finally, the company's strategy is also one of the important links, a good strategy helps investors and customers evaluate the company's future business activities and prospects, thereby driving the stock price up.

2.2 Summary of This Chapter

This chapter briefly introduces related theories such as multi-case analysis, correlation analysis, Pearson coefficient, etc. It also introduces the relevant influencing factors of shipping airlines and their stock prices, which provides a theoretical basis for the selection of the main body of the article.

3. Major International Events and Related Changes in the Company's Business and Share Price

3.1 Major International Events

3.1.1 Coronavirus

Corona Virus Disease 2019 (COVID-19), also known as "COVID-19", is a global pandemic caused by severe acute respiratory syndrome coronavirus (SARS-CoV-2) in late 2019. As of 27 October 2024, there have been 776,754,317 confirmed cases of COVID-19 in the world, including 7,073,466 confirmed deaths from COVID-19, according to WHO [4]. This is another major public health security incident after SARS, which has had a significant impact on the economic development of all countries.

3.1.2 Russia-ukraine conflict

The Russia-Ukraine conflict is the largest armed conflict in Europe after World War II, which broke out on February 24, 2022, and in the early morning of the 24th, Putin announced a "special military operation", and the troops were divided into four routes to invade Ukraine from four directions: east, south, north and northeast, breaking the peace and stability in Europe. It has caused the deaths of hundreds of thousands of soldiers and civilians, as well as a refugee crisis. This has been accompanied by global sanctions against Russia, which have further hit the global economy, soared agricultural and energy prices, and pushed global inflation to the highest level in the 1970s, which has had a significant impact on people's livelihoods and the economy [5].

3.1.2 2024 U.S. general election

On November 6, 2024, Trump won the U.S. election with 312 votes and became the 47th president of the United States. Trump's coming to power also marks the return of conservatives led by the Republican Party to the American stage. For globalized trade, after Trump takes office, the United States will impose 25% tariffs on Canada and Mexico, 10% tariffs on China, and Canadian energy will face a lower 10% tariff [6]. This indicates that the trend of anti-globalization will be further intensified, and the forces of trade protectionism will continue to rise. And for international shipping airlines, this is bad news.

3.2 Changes in the Shipping and Aviation Operations of the Relevant Countries

3.2.1 China-COSCO SHIPPING holdings

COSCO SHIPPING Holdings, formerly known as China COSCO Holdings Co., Ltd., is the flagship platform for overseas listing of China COSCO Group's shipping business. It was listed in Hong Kong and Shanghai in 2005 and 2007 respectively-stock code (09191. HK). HK; 609191), as of the end of the first half of 2022, COSCO SHIPPING Holdings' self-operated container fleet capacity exceeded 2.92 million TEU, and the fleet size was at the forefront of the industry [7]. Before the epidemic, COSCO SHIPPING Holdings' total assets increased from 119,652,733,500 yuan in 2016 to 262,224,029,500 yuan in 2019. The operating income increased from 71,160,180,900 yuan in 2016 to 15,105,668.21 million yuan in 2019. Before the pandemic, COSCO SHIPPING Holdings' profit margins and assets were growing rapidly. And with the outbreak of the new crown epidemic, the shipbuilding industry and offshore engineering services have decreased. Its profit fell sharply, with a net profit of RMB 4.769 billion in 2020, a year-on-year decrease of about 30.6%. Its stock price fell in 2020 due to the new crown epidemic, but with the stability of the national epidemic prevention policy, and at the same time, COSCO SHIPPING Holdings actively cooperated with epidemic prevention and control and adopted digital platforms to complete order transactions and other measures, the order volume gradually began to recover, and the stock price of COSCO SHIPPING Holdings began to recover slowly. On July 7, 2021, it reached a high price of 32.6 yuan/share, and since then, the stock price of COSCO SHIPPING Holdings has gradually

declined, and as of October 31, 2022, the stock price of COSCO SHIPPING Holdings has reached 11.23 yuan/share, as shown in Fingre 2

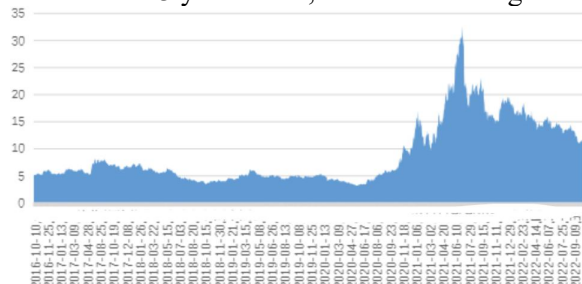


Figure 2. The Closing Price of COSCO SHIPPING Holdings Stock

Europe-maersk line

Maersk Line is a world-famous multinational shipping group. Its business includes container fleet, offshore oil exploration and transportation as its main business, and it is also the world's largest container ship operator and container ship supplier [8]. In 2022, Maersk Line, which was less affected by the Russia-Ukraine conflict, saw its revenue rise 32% to \$81.5 billion and EBIT up 57% to \$30.9 billion. The financials were fully in line with expectations. Expanded its integrated logistics capabilities through the

acquisitions of companies such as Pilot, Senator and LF Logistics, and achieved growth in its logistics business through organic growth, with a compound annual growth rate of more than 20%.[9]. In 2023, due to the impact of the post-epidemic era and the impact of international wars such as the Russia-Ukraine conflict, Maersk Line's total net profit in 2023 will be US\$3.9 billion, a significant decrease from the peak of US\$29.2 billion in 2022. According to Maersk's annual report released today, revenue in 2023 was \$51 billion. This figure is also a significant decrease from the previous year's \$81.5 billion [10]. Therefore, after suffering the impact of the epidemic and the war, the profits of European shipping companies have dropped significantly. In terms of stock price, Maersk Line's share price fluctuated greatly in 2022 and 2023, showing a downward trend as a whole, from a high of 21,785.936 Danish kroner at the beginning of 2022 to 11,373.681 Danish kroner at the end of 2023, indicating that the financial market is not optimistic about Maersk Group's share price due to the impact of the epidemic and the Russia-Ukraine conflict, as shown in Fingre 3



Figure 3. Maersk Line Stock Price

3.2.3 United states-trump's election impact on shipping industry

With Trump's election, conservative forces came to power. President Trump announced plans to impose a 10 percent tariff on all U.S. imports and a 60 percent tariff on Chinese products, aimed at boosting U.S. manufacturing and reducing the trade deficit [11]. When Trump first became president, there was a big difference between him and Biden in terms of business capacity for trade. After Trump's election, shipping stocks across Asia fell, with shares of

COSCO SHIPPING Holdings Limited falling 2.4% at the close of trading on the Shanghai Stock Exchange and 3.5% at the close of the Hong Kong Stock Exchange on November 6, 2024. Shares of Japan's three major diversified shipping groups-NYK, MOL and Kawasaki Kisen-fell between 1.3% and 3.9%. Taipei-listed Manhae Shipping and Seoul-listed Hyundai Merchant Marine fell 1.2% and 4.3%, respectively. This suggests that Trump's election is not good news for shipping companies. Shareholders are also not optimistic about the

prospects of shipping companies in the future, as shown in Figure 4.

US crude exports: Trump vs Biden presidencies

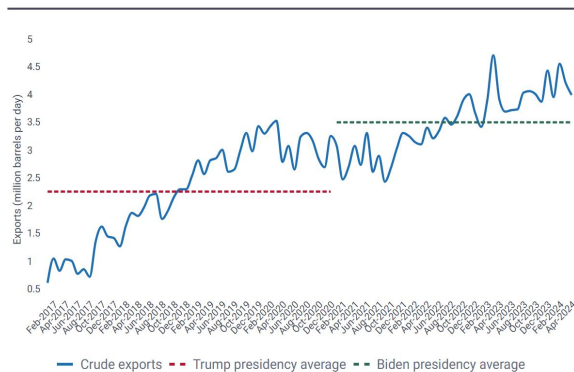


Figure 4. Biden and Trump When They Took Office

3.3 Summary of This Chapter

This chapter introduces three international events: the new crown epidemic, the Russia-Ukraine conflict, and the U.S. election. COSCO Shipping, Maersk Line, and Asia Shipping stocks were selected for analysis. The changes in business and profits of the relevant formulas in the context of major international events are analyzed, and the market's perception of the company's prospects is illustrated by explaining the changes in stock prices.

4. Study the Correlation Changes in Stock Prices in the Event of Adverse Factors Such as Wars and Epidemics

International events are often one of the most important variables affecting stock prices. For example, in 2024, the United States suddenly adjusts its trade policy and imposes tariffs on technology products, which could directly impact the global supply chain, and stock prices may fluctuate wildly as a result. Investors and company executives need to quickly determine how such external shocks will affect market performance. This is where the Pearson

correlation coefficient comes in handy to help us quantify the relationship between these events and specific financial indicators, and in stock investment analysis, the Pearson correlation coefficient can be used to tease out the logical chain between international events and stock prices. In this way, investors can not only see the short-term impact of international events on the market but also tap into potential investment opportunities. In summary, international events are external drivers of stock price fluctuations, and the Pearson correlation coefficient provides a bridge to connect macro changes with a company's stock price and strategy. In investing, it can help you quantify the relationship between risk and return, and find the balance of asset allocation; Strategically, it reveals the impact of changes in the external environment on internal operations and optimizes resource allocation. This chapter will illustrate examples in detail.

4.1 Methodological Overview

This chapter will primarily use the Pearson coefficient to correlate company stock prices with international events. The stock prices of COSCO Shipping Holdings, Maersk Group, and South Korea's Hyundai Merchant Marine are selected to illustrate their correlation during the new crown epidemic, the Russia-Ukraine conflict, and the U.S. election.

4.2 COSCO Shipping Holdings.

As mentioned above, due to the impact of the epidemic, its business volume and profit margin have been affected to a certain extent, but with the adjustment of national policies, its stock price and business have rebounded. In this paper, we will select data from 2020 to 2022 for analysis:

1) The company's share price (based on the closing price), as shown in Table 1:

Table 1. Changes in COSCO SHIPPING Holdings' Share Price from 2020 to 2022 RMB

DATA	Closing	Opening	High	low	Volume	Change percent
2021/12/1	18.69	17.02	19.98	16.95	5.37B	7.60%
2021/11/1	17.37	16.53	17.77	14.44	4.27B	5.08%
2021/10/1	16.53	16.9	17.46	15	3.87B	-4.34%
2021/9/1	17.28	20.53	23.55	16.51	6.18B	-16.68%
2021/8/1	20.74	17.8	22.65	17.51	6.71B	17.44%
2021/7/1	17.66	23.68	25.69	16.72	7.59B	-24.83%
2021/6/1	23.49	16.24	23.59	15.23	7.95B	42.91%
2021/5/1	16.44	15.3	17.58	14.06	6.68B	16.90%
2021/4/1	14.06	10.54	14.5	10.31	6.97B	35.21%
2021/3/1	10.4	9.85	10.4	7.38	5.50B	6.96%

2021/2/1	9.72	9.02	10.24	7.96	3.39B	1.85%
2021/1/1	9.55	9.65	13.58	9.14	5.77B	1.64%
2020/12/1	9.39	7.48	9.73	6.68	4.36B	23.08%
2020/11/1	7.63	5.22	8.43	4.89	5.46B	51.68%
2020/10/1	5.03	4.62	5.11	4.51	1.14B	14.14%
2020/9/1	4.41	4.18	4.78	4.12	1.86B	5.33%
2020/8/1	4.18	3.49	4.35	3.49	2.09B	25.64%
2020/7/1	3.33	2.67	3.52	2.65	2.12B	24.78%
2020/6/1	2.67	2.45	2.87	2.45	726.81M	9.81%
2020/5/1	2.43	2.73	2.78	2.42	621.28M	-12.22%
2020/4/1	2.77	3.15	3.15	2.65	769.26M	-12.41%
2020/3/1	3.16	3.12	3.53	3.01	925.33M	1.73%
2020/2/1	3.11	3.29	3.46	2.96	753.88M	-14.95%
2020/1/1	3.65	4.07	4.19	3.57	720.41M	-9.87%

2) Number of infected people: Based on the number of new cases in China (2020-2022), as shown in Table 2 and Table 3.

Table 2. 2020-2022 COVID-19 Infections and Increase in China

Time	People	Increase
Jan-20	11821	11791
Feb-20	79968	68033
Mar-20	82631	2721
Apr-20	85232	317
May-20	84588	155
Jun-20	85232	514
Jul-20	88122	634
Aug-20	90402	848
Sep-20	91061	401

Oct-20	91921	559
Nov-20	93577	557
Dec-20	96762	541
Jan-21	110974	1156
Feb-21	101920	1706
Mar-21	102762	234
Apr-21	103622	457
May-21	111523	437
Jun-21	118572	719
Jul-21	120772	1225
Aug-21	123068	1866
Sep-21	124673	257
Oct-21	126078	1537
Nov-21	127938	1527
Dec-21	132071	2352

Table 3. Relevant Calculation Process

Time	X _i	Y _i	x _i =X _i -	y _i =Y _i -	x _i *y _i	x _i ²	y _i ²
2020.1	11791	3.65	7600.42	-6.4083	-48720.1	57762395	41.047
2020.2	68033	3.11	63842.42	-6.9483	-443963	4.08e+09	48.27
2020.3	2721	3.16	-1469.58	-6.8983	10138.09	2158687	47.579
2020.4	317	2.77	-3873.58	-7.2883	28253.94	14999677	53.118
2020.5	155	2.43	-4035.58	-7.6283	30778.03	16285606	58.172
2020.6	514	2.67	-3676.58	-7.3883	27161.13511584		54.573
2020.7	634	3.33	-3556.58	-6.7283	23903.68	12645352	45.299
2020.8	848	4.18	-3342.58	-5.8783	19658.54	11179565	34.535
2020.9	401	4.41	-3789.58	-5.6483	21389.87	14357113	31.881
2020.10	559	5.03	-3631.58	-5.0283	18278.91	13187258	25.284
2020.11	557	7.63	-3633.58	-2.4283	8823.31	13206986	5.898
2020.12	541	9.39	-3649.58	-0.6683	2439.52	13348982	0.446
2021.1	1156	9.55	-3034.58	-0.5083	1541.76	9208629	0.258
2021.2	1706	9.72	-2484.58	-0.3383	841.38	6176166	0.114
2021.3	234	10.4	-3956.58	0.3417	-1352.69	15664542	0.117
2021.4	457	14.06	-3733.58	4.0017	-14942.2	13943658	16.013
2021.5	437	16.44	-3753.58	6.3817	-23946.3	14085644	40.745
2021.6	719	23.49	-3471.58	13.4317	-46642.9	12051930	180.481
2021.7	1225	17.66	-2965.58	7.6017	-22563.4	8793662	57.775
2021.8	1866	20.74	-2324.58	10.6817	-24840.9	5402669	114.107
2021.9	257	17.28	-3933.58	7.2217	-28413.1	15467420	52.176

2021.10	1537	16.53	-2653.58	6.4717	-17183.3	7044339	41.902
2021.11	1527	17.37	-2663.58	7.3117	-19497.3	7101609	74.516
2021.12	2352	18.69	-1838.58	8.6317	-15877.3	3379346	74.516

3) Calculation: Average number of new infections (X) = 4190 average closing price (Y) = 10.01

$$\sum = -574049.76 \quad \sum^2 = 4331878051.28 \quad \sum^2 = 1044.428$$

$$r = \frac{-574049.76}{\sqrt{4331878051.28 \cdot 1044.428}} \approx -0.0085$$

In summary, the correlation coefficient $r \approx -0.0085$. It means that there is almost no linear correlation between the number of new infections and the closing price of the company's stock price. There is only a low negative linear relationship.

4.3 Maersk Line

As mentioned above, Maersk Group's earnings and stock price have fluctuated greatly due to the impact of the epidemic and the Russia-Ukraine conflict, and this chapter will use Maersk Line's share price and the number of casualties in the Russia-Ukraine conflict as a comparison to calculate the relationship between its stock price and the Russia-Ukraine war, as shown in Table 4.

1. The company's share price (based on the closing price): DKK (2022.2-2024.2)

Table 4. Maersk Line's Share Price and Movements

Time	Closing	Opening	High	Low	Volume	Change pe
2024/2/1	9,378	12,201	12,548	9,301	803.05K	-23.41%
2024/1/1	12,245	11,917	13,885	11,908	776.65K	4.82%
2023/12/1	11,682	10,522	12,432	9,906	707.04K	12.41%
2023/11/1	10,392	11,355	11,783	9,430	747.86K	-7.89%
2023/10/1	11,282	12,389	13,072	10,931	477.98K	-7.93%
2023/9/1	12,254	12,163	12,562	11,739	399.28K	1.84%
2023/8/1	12,033	13,279	13,322	11,994	513.13K	-10.26%
2023/7/1	13,409	11,638	13,755	11,566	483.83K	16.37%
2023/6/1	11,523	11,383	12,355	10,994	589.77K	2.22%
2023/5/1	11,273	11,739	11,990	10,772	492.59K	-3.94%
2023/4/1	11,735	11,975	13,520	11,003	702.18K	-2.00%
2023/3/1	11,975	15,805	16,613	10,681	890.18K	-24.16%
2023/2/1	15,790	14,424	16,122	14,174	697.87K	10.76%
2023/1/1	14,256	15,165	15,834	13,520	538.81K	-5.15%
2022/12/1	15,030	14,953	15,598	13,823	545.13K	1.76%
2022/11/1	14,770	15,223	15,588	13,760	592.75K	-2.60%
2022/10/1	15,165	13,293	15,502	12,379	591.48K	13.66%
2022/9/1	13,342	16,690	16,883	12,687	752.41K	-21.91%
2022/8/1	17,085	19,235	21,795	16,960	625.28K	-10.28%
2022/7/1	19,043	16,180	19,096	15,362	451.73K	19.54%
2022/6/1	15,930	19,543	20,890	15,560	592.64K	-18.13%
2022/5/1	19,457	19,870	21,179	17,821	591.98K	-2.22%
2022/4/1	19,899	19,514	20,140	16,758	522.38K	1.52%
2022/3/1	19,601	20,149	23,036	18,350	656.35K	-3.09%

Russia-Ukraine Death Toll: Take, for example, the number of Russian deaths

Since the death toll of the war can reflect the intensity of the war, so-called, this article uses the number of Russian deaths to quantify the intensity of the Russia-Ukraine conflict.

First: Pair the stock's closing price data with the previous month's casualty data, as shown in Table 5:

x is the closing price of the stock and y is the number of casualties n=24 (number of data

points).

$$\sum x = 338549$$

$$\sum y = 384140$$

$$\sum xy = 5023665450$$

$$\sum x^2 = 4996861365$$

$$\sum y^2 = 7462656600$$

$$\sum (X_i - \bar{x})(Y_i - \bar{y}) = -9482242060$$

$$\sqrt{\sum (x_i - \bar{x})^2 \cdot \sum (y_i - \bar{y})^2} = 12941784000$$

$$r = -0.733$$

Pearson's correlation coefficient $r \approx -0.73$. This

suggests a moderate negative correlation between the closing price of Maersk Group's shares and the number of casualties in Russia, i.e.: when the number of casualties increases, the stock price tends to fall; When the number of casualties decreases, stock prices tend to rise, as shown in Table 6.

Table 5. 02/2022-01/2024 Russian Casualties

Time	Casualties poeple
Feb-22	4500
Mar-22	13000
Apr-22	5700
May-22	7300
Jun-22	5100
Jul-22	5230
Aug-22	7070
Sep-22	11180
Oct-22	12120
Nov-22	16700
Dec-22	18060
Jan-23	21540
Feb-23	21740
Mar-23	24120
Apr-23	17150
May-23	17400
Jun-23	20430
Jul-23	17850
Aug-23	16830
Sep-23	15110
Oct-23	22680
Nov-23	27950
Dec-23	30470
Jan-24	24910

Table 6. Stock Prices Are Summarized in the Number of Casualties

Closing	death toll
19601	4500
19899	13000
19457	5700
15930	7300
19043	5100

Table 7. 10/28/2024-11/11/2024 Hyundai Stock Price and Change

Date	Price	Open	High	Low	Vol.	Change %
11/11/2024	15,750	16,910	16,950	15,750	2.82M	-7.62%
11/08/2024	17,050	17,200	17,440	16,940	842.70K	-0.29%
11/07/2024	17,100	17,050	17,210	16,860	849.75K	0.12%
11/06/2024	17,080	17,840	17,840	17,010	1.13M	-4.26%
11/05/2024	17,840	17,620	17,840	17,360	760.99K	-0.11%
11/04/2024	17,860	17,110	17,860	17,000	1.42M	4.63%
11/01/2024	17,070	17,060	17,340	16,880	607.92K	-0.29%
10/31/2024	17,120	17,350	17,350	16,910	946.23K	-0.87%

17085	5230
13342	7070
15165	11180
14770	12120
15030	16700
14256	18060
15790	21540
11975	21740
11735	24120
11273	17150
11523	17400
13409	20430
12033	17850
12254	16830
11282	15110
10392	22680
11682	27950
12245	30470
9378	24910

4.4 Hyundai Merchant Marine in South Korea

As mentioned above, due to the impact of the U.S. election, the relevant stock prices of Asian shipping companies have fallen. This chapter uses the modern merchant navy as a representative to describe its connection to the U.S. election.

Considering that the U.S. election is a relatively abstract event, we have no way to quantify the election results and can only analyze them by comparing the stock prices before and after Trump's victory.

As you can see in the chart, the company's share price fluctuated until November 4, but generally rose by a large margin, after the election of Trump on November 5. Affected by the turmoil, the stock price of Hyundai Merchant Marine Company generally showed a downward trend. It can be concluded that Trump's election has a negative correlation with the Asian shipping industry, as shown in Table 7.

10/30/2024	17,270	17,360	17,360	17,060	503.80K	-0.52%
10/29/2024	17,360	17,140	17,360	17,100	566.79K	0.40%
10/28/2024	17,290	16,900	17,300	16,850	888.49K	2.73%

4.5 Theory and Practice

The Pearson correlation coefficient is a measure of the strength and direction of the linear relationship between two variables, with values ranging from -1 to 1. When the value is biased to 1, it means that there is a strong positive correlation between the two variables, and when the value is biased to -1, it means that the two variables have a strong negative correlation. And in the three examples given above. COSCO SHIPPING Holdings has little correlation with the new crown epidemic, which means that when considering investing in this stock, it is not only affected by the international environment, but also closely related to the relevant policies of small governments and the company's response measures. Therefore, investors need to analyze the macro and micro parts, not only to observe the big events, but also to analyze the company's financial reports and their own strategies. In the U.S. election and the Russia-Ukraine conflict, the stock prices of Maersk Line and related shipping companies in Asia have fallen to varying degrees, so as an investor, you should unbundle or short sell as soon as possible when you find that the trend is not right, to achieve the purpose of hedging

Considering the limitations of Pearson's correlation coefficients, some nonlinear models can be used to demonstrate this, such as neural network methods, which capture nonlinear patterns of news events and stock prices through multilayer perceptron's, or polynomial regression to model the multi-stage impact of policy changes (such as tax adjustments) on stock prices.

4.6 Summary of This Chapter

This chapter uses the Pearson correlation coefficient to analyze the correlation analysis of the new crown epidemic on COSCO Shipping Control and the Russia-Ukraine conflict on Maersk Shipping. and briefly explained the impact of the U.S. election on the shipping industry. It is concluded that the new crown epidemic has less impact on COSCO Shipping Control, and the Russia-Ukraine conflict and the U.S. election have a greater impact on shipping companies.

5. Conclusion

This article introduces international events such as the Russia-Ukraine conflict, the COVID-19 pandemic, and the US election. Through the Pearson correlation coefficient analysis, it is concluded that the international situation has different impacts on the stock prices of related shipping companies under different circumstances. Although in general, the business and stock prices of shipping companies will not be too stable under the background of an unstable international situation, the stock prices themselves can still be kept stable due to the company's internal strategy, judgment of the international situation, and response methods. Shipping companies can reduce single market risks by diversifying their investments (such as expanding diversified routes); investors should closely monitor policy changes (such as tariff adjustments) to optimize their positions. At the same time, companies can use hedging tools (such as futures contracts) to cope with price fluctuations and enhance their ability to resist risks. These strategies not only improve the accuracy of decision-making by companies and investors, but also promote the steady development of the industry and, in turn, promote more reasonable national policy formulation.

References

- [1] Li Liangang, Hu Xiaohui. Spatiotemporal pattern and influencing factors of China's regional economic resilience under the novel coronavirus pneumonia epidemic. *Journal of World Geography*, 2023, 32(3):64.75.
- [2] Stanivuk, T., Lalić, B., & Amižić, Z. 2023. General Assessment of the Impact of the War in Ukraine on the Shipping Industry Using Parametric Methods. Doi: 10.7225/toms.v12.n02.018
- [3] ZHANG Mengxia, JIANG Guohai . Research on the Mechanism of Government Short-term Consumption Stimulus Policy on Economic Recovery: Based on the Interpretation of Multiple Cases in Developed and Developing Countries[J]. *Journal of Finance and Economics*, 2022, (2):24-32.
- [4] World Health Organization. (2024, October 27). COVID-19 pandemic statistics.

- Retrieved from <https://www.who.int>
- [5] Half a year after the outbreak of the Russian-Ukrainian war, 10 great changes in the global economy. Fortune Insight. 2022-08-24 [2024-01-28].
- [6] BBC News. (Year, Month Date). Reactions to Trump's executive order imposing tariffs on China, Mexico, and Canada. Retrieved from [URL of the article]
- [7] LIU Yu. (2023). Correlation Analysis of Stock Prices of Listed Shipping Companies and BDI under the New Crown Epidemic (Master's Thesis, Dalian Maritime University).
- [8] Container shipping. Economist.com. 2005-05-11 [2007-12-04].
- [9] A.P. Moller-Maersk. (2022). Annual report 2022.
- [10] A.P. Moller-Maersk. (2023). Annual report 2023.
- [11] MAERSKA. (2022). Stock price performance [Graph]. Retrieved from [source URL].