Research on Impact of Macroeconomic Fluctuations on the Profitability of China's Huawei

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Abstract. This paper categorizes Huawei's American suppliers into two types based on the proportion of revenue they derive from Huawei. The first type consists of US suppliers with a low dependency on Huawei and are less affected by the trade war and Huawei bans. The second type includes US suppliers with a high dependency on Huawei, where Huawei is a major customer, and a significant portion of their annual procurement amount constitutes a large share of their revenue. Any reduction or cessation of orders from Huawei drastically reduces these suppliers' revenue, impacting their operational performance significantly. The paper then focuses on New Photonics, a US supplier with nearly half of its annual revenue from Huawei, to analyze the adverse effects of the US-China trade war on its performance. Firstly, after Huawei was listed on the Entity List, Huawei's share dropped nearly 15%, and the company's ability to collect payments from this major customer also deteriorated. Secondly, Huawei's orders were ceased due to the US-China trade war. Subsequently, event studies revealed that US-China trade negotiations and the Entity List incident had positive and negative impacts on New Photonics' market performance, respectively. Finally, the US-China trade war filled the Chinese market with uncertainties. The company's ratio of revolving loans decreased significantly, which also impacted the company's investment behavior and capital utilization efficiency. To cope with the US-China trade war, New Photonics adjusted its business strategies by enhancing product R&D, strengthening cost control, and transforming financing methods.

1 Introduction

1.1 Research background

Amid macroeconomic fluctuations, China has placed increasing emphasis on optimizing the economic structure, shifting from prioritizing speed to focusing on quality, with the development of high-tech industries showing positive momentum. In this trend, it is crucial for high-tech companies to recognize their profitability levels, identify the reasons for declines in profitability, and manage profitability to sustain business development [1].

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Huawei, as a latecomer in the electronics and information manufacturing industry, has been ranked among the Fortune 500 since 2010. With its unconventional strategic thinking and unique management mechanisms, it has attracted considerable attention from all sectors of society in recent years due to its rapid development. Therefore, this paper chooses Huawei to analyze the management of profitability under economic fluctuations, identify problems in Huawei's profit management, and provide improvement suggestions [2]. It aims to offer ideas for enhancing future profitability management of enterprises and provide a reference for profitability management in the same industry.

1.2 Literature review

As for the impact of economic fluctuation on mobile phone markets, despite extensive negotiations in 2019 aimed at resolving differences and reducing protectionism in the technology sector, the tension between the United States and China has persisted. The trade war continued to have dire effects on both nations and global trade. The renewed strain can be attributed primarily to two factors: reciprocal accusations regarding the origins of COVID-19 and the deployment of new 5G mobile technology by Chinese firms like ZTE and Huawei. Incekara conducted a thorough analysis of how this renewed trade conflict between China and the United States impacts international technology prices and global trade [3]. This analysis utilizes economic theories to understand the dynamics involved. Increased mistrust in the technology sector has led to price fluctuations within the industry. Furthermore, according to Marshall's law of demand and supply, these phenomena can be more precisely explained; with reduced demand for technological products, the digital industry may need to lower prices to maintain revenue.

Based on Haskan, the 2018-2019 US-China trade war was bound to happen due to macroeconomic factors, industrial and trade policies, and trade imbalances between the two nations [4]. The US initiated by raising tariff rates on Chinese goods, to which China responded in kind. This led to trade diversion, with other Asian exporters slightly taking over the market share of Chinese exports to the US. After two years, many of the Trump Administration's goals remained unachieved: Manufacturing employment saw no significant benefit, and the bilateral trade imbalance was largely unchanged. China continued its robust state-supported initiative to develop national champions and lessen its reliance on US technology. Supply chains, particularly those for intermediate goods, faced disruptions, prompting some US manufacturers to seek alternative sources. The US government devised new strategies to limit technology exports to China and impose sanctions on Chinese firms. Thus, the trade war acted as a forerunner or catalyst for a deeper hardening of relations between the two countries [5].

1.3 Research gap

Scholars have found that global economic fluctuations impact corporate innovation, productivity, and cost mark-ups, with two distinct effects on innovation: promotion and capture. Furthermore, financial constraints, to some extent, hinder companies from participating in global value chains, causing them to drift towards the lower end of the value chain [6]. Existing research on the impact of trade protection theory on companies proceeds from both positive and negative aspects. On the one hand, trade protection measures ensure the competitiveness of domestic products, prompting affected companies to develop proprietary intellectual property and motivating resource optimization and upgrading [2]. On the other hand, these measures impact the export shares of supplier companies, weaken their R&D and innovative capabilities, and affect the productivity and profitability of bilateral companies [7].

1.4 Research framework

This paper explores the relationship between global value chains and trade frictions from the perspective of suppliers, enriching the literature on company-level studies in global value chains and trade protection. Using the case of American New Photonics, this paper employs event study methods, among others, to analyze changes in company profitability and performance under the US-China trade war, providing material for case studies under the US-China trade war.

2 Case description

This paper focuses on a case study of New Photonics, an American supplier to Huawei that has been repeatedly affected by the US-China trade war. By analyzing the adverse effects of the US-China trade war on the company's market and operational performance, this study helps to draw conclusions about the economic impact on American businesses brought by the trade war, and it may also offer advice to other companies.

The use of cross-methodologies in the research process allows them to complement and support each other, making this study more systematic and comprehensive. The impact of the US-China trade war on the performance of different types of American suppliers to Huawei varies; American suppliers with a high dependency on Huawei experienced a more significant drop in cumulative abnormal returns after Huawei was added to the Entity List. Suppliers with high dependence on Huawei, deriving a large proportion of their revenue from Huawei, are particularly sensitive to the performance impacts of the US-China trade war, especially the US ban on Huawei.

New Photonics, which earns nearly half of its annual revenue from Huawei and its affiliated HiSilicon semiconductor company, is considered a supplier with high dependence on Huawei [8]. The US-China trade war has had a detrimental effect on its performance in many aspects. To further study the impacts of the US-China trade war on the performance of Huawei's American suppliers, this paper selects New Photonics as the case study subject, analyzing both market performance, operational performance impacts, and response strategies.

3 Analysis on the problem

3.1 Decline in receivables collection capability from major customers

The accounts receivable of a company are caused by credit sales, which, on the one hand, expand the company's market reach and increase its business scale; on the other hand, they also lead to a significant amount of receivables. An increase in receivables can easily cause a shortage of company funds and exacerbate business risks. Generally, there is a positive correlation between a company's accounts receivable and its operating income [9]. When the company is performing well, the growth rate of operating income tends to exceed that of accounts receivable. However, during poor management periods, the growth rate of accounts receivable may accelerate excessively. The proportion of accounts receivable to operating income for New Photonics' major customer, Huawei, for Q3 2017 shows that Huawei's share of accounts receivable was significantly higher than its share of operating income. Over the following quarters, the collection of new photonics from major customers, such as Huawei, gradually improved. With the outbreak of the Entity List event in Q2 2019, the rate of decline in the proportion of receivables attributable to major customers was slower than the decline in their share of operating income [9]. This indicates that although the reduction in Huawei's

orders decreased its proportion of operating income, New Photonics' ability to collect payments from this customer did not correspondingly improve. The dominant position of major customers can consume a higher proportion of New Photonics' commercial credit, worsening the company's ability to collect payments.

3.2 Decline in forecasted company performance

New Photonics manufactures based on individual purchase orders or through the Vendor Managed Inventory (VMI) model. Many customers, especially the major client Huawei and its affiliated company, HiSilicon Semiconductor, may increase, reduce, cancel, or delay existing purchase orders. A significant portion of New Photonics' revenue comes from a limited number of clients. Hence, any major reduction or loss of orders from key clients can have a substantial impact on total operating income and operating profit.

Performance forecasts refer to the advance notification of financial results by listed companies before the announcement date of the accounting report. The purpose is to mitigate severe stock price fluctuations when the accounting report is officially released, thereby preempting performance risks and protecting the interests of small and medium investors and other informationally disadvantaged groups [10]. New Photonics forecasted changes in operating income. After Huawei was placed on the Entity List, New Photonics had to reassess its ongoing business and issued a profit warning on May 23 for the second quarter, revising its previously expected revenue from $88 million to $93 million down to $75 million to $80 million. Although the year-over-year change was still an increase, the growth rate had significantly decreased [10]. In Q3 2019, due to US-China trade negotiations and the "temporary license" issued by the US to Huawei, there was a slight increase in the growth rate of forecasted operating income for New Photonics.

3.3 Rising debt financing costs and decreases scale

To meet the capital requirements necessary for maintaining normal operations, in September 2017, New Photonics entered into a $50 million revolving credit agreement with Wells Fargo, of which $5 million was to remain undrawn. This agreement was set to expire in June 2022 [11]. By the first quarter of 2019, $36.3 million of this facility had been utilized, representing 72.6% usage. With the outbreak of the Entity List incident in the second quarter, the amount drawn decreased to $31.7 million, reducing the usage rate to 63.4%, indicating a significant change in the scale of financing utilized. On June 14, 2019, New Photonics made its first amendment to credit facilitation, removing Huawei from the "qualified accounts" used as the basis for borrowing [11]. Huawei's orders could no longer occupy the credit limit of this agreement, and the USS Huawei ban disrupted New Photonics' relatively stable cash inflow. To alleviate the repayment pressure of short-term loans, the company removed Huawei from "qualified accounts," thus significantly reducing the usage ratio of the revolving loans.

The changes in the interest and interest rates of New Photonics' revolving credit are shown in Table 1. Compared to the first quarter, the company's loan interest rates increased in the second quarter of 2019, and despite a nearly 10% decrease in usage ratio, the total amount of loan interest decreased only slightly, resulting in an overall increase in financing costs [12]. In the third quarter, the company's loan interest rates experienced a slight decrease, benefiting from the "temporary license" issued by the USS Department of Commerce, which, to some extent, reduced New Photonics' financing costs.

Table 1. Changes in Cash Holdings Level of New Photonics

Unit: $10,000 USD	2017Q3	2017Q4	2018Q1	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2	2019Q3
Total Cash	5852.8	7890.6	7186.7	4838.3	5209.9	5818.5	5979.3	5510.7	6139.6
Cash Holding Level	14.71%	19.58%	18.42%	13.45%	15.65%	17.08%	17.36%	17.30%	18.87%
Year-over-Year Change		-7.22%	-11.32%	-28.59%	6.45%	-12.75%	-5.74%	28.62%	20.55%

3.4 Decline in market investor confidence

The Standard & Poor's 500 Index is a stock index that tracks the stock performance of 500 listed companies in the United States. It is created and maintained by Standard & Poor's. Compared to other indices, the S&P 500 includes more companies. Thus, it has more diversified risks and can reflect broader market changes [12].

In 2019, the overall trend of the S&P 500 Index was upward, with an increase of about 20%. New Photonics showed a significant acceleration in its rate of change from January to March, with overall stock returns higher than those of the S&P 500 index. That includes two points: a significant drop in the stock return rate of New Photonics after the Entity List event in May, at times exceeding a 40% decline; the announcement in mid-August 2019 by USS Commerce Secretary Ross that the "Temporary General License" allowing Huawei to purchase American products would be extended for another 90 days, set to expire on November 18, Eastern Standard Time [13]. At that point, business cooperation between American companies and Huawei would be subject to USS government regulation and restrictions. New Photonics partially resumed supplying Huawei, which led to a recovery in stock return rates, but overall, it remained in negative growth.

Reductions in holdings by major shareholders and executives have always been a significant indicator affecting stock prices. These reductions dilute the total amount of capital in the secondary market, often resulting in the outflow of tens or even hundreds of millions of dollars. Extensive sell-offs by shareholders indicate that the leadership anticipates a significant decline in the company's future profitability and that the stock price may reach a peak that cannot be surpassed for a long time, exerting substantial downward pressure on the stock price [14].

4 Suggestions

4.1 Enhancing product research and development

New Photonics' top five customers include two Chinese companies, Huawei and FiberHome, with a significant portion of its revenue sourced from the Chinese market. Consequently, the company's business strategies are closely linked to the Chinese market. However, Chinese

enterprises cannot fully meet the needs of downstream optical communication equipment, which provides substantial market opportunities for foreign companies like New Photonics, which are positioned in the midstream sector. The telecommunications network industry is highly competitive. New Photonics' competitors may develop new products faster and offer more reliable or feature-rich products to attract major customers Huawei, thus reducing New Photonics' market share [15].

In early 2018, the US repeatedly obstructed Huawei from entering the US market, citing security risks with Huawei phones, which significantly damaged Huawei's sales in the US market and created friction with New Photonics, a US supplier. Recognizing the disadvantages of over-reliance on Huawei for business revenue, to compete with Chinese companies like HGTECH and OptiTech, New Photonics had to increase its proportion of R&D spending. By offering high-tech products, it aims to cultivate customers in other markets actively, thereby establishing beneficial collaborations with other clients [14]. Suppose other countries' technology-intensive suppliers are prohibited from supplying to the company. In that case, domestic suppliers will be more committed to technological R&D and strengthen the innovativeness of their products to withstand the impact of trade barriers. Consequently, HGTECH's R&D expenses as a percentage of operating income also show an upward trend.

4.2 Strengthening cost control

As technology progresses in the communications network industry, price and performance improvements put pressure on existing products, causing their prices to decrease over time. New Photonics anticipates that due to pressure from its top five customers, especially Huawei, the pricing pressure on the company's products will persist [3]. Customers may also seek other suppliers who can offer lower costs for internally developed and competitive manufactured products. New Photonics has a high concentration of customers, which somewhat reduces its risk resistance. Any risk or change among its customers could significantly impact the company's sales. To maintain or increase its market share, New Photonics needs to alter its business strategies, even at the cost of reducing profits, to keep prices low and retain customer stability.

4.3 Shift in financing methods

Under the US-China trade war, New Photonics suffered a significant loss of orders from Huawei, its major customer. The suspension of Huawei orders not only impacts New Photonics' revenue in the Chinese market but also exposes the company to substantial conversion and exit costs following the loss of a major customer, leading to cash flow disruptions and financial difficulties. Therefore, New Photonics must maintain a good cash flow status to mitigate risks [16]. Short-term debt put excessive repayment pressure on the company, prompting New Photonics to change its original financing methods and opt to issue common stocks for financing. Inphi is a gold supplier for New Photonics and the next-generation optical module partner for New Photonics' 100G systems. Leveraging the strong cooperative relationship with Inphi, New Photonics chose to issue common stocks directed at Inphi, with key information summarized in the prospectus as shown in Table 2. New Photonics planned to issue stocks to Inphi in two forms: the first being the issuance of 103,734 common stocks in March 2019; the second form involved issuing additional shares worth $1 million each on August 15, 2019, September 15, 2019, February 15, 2020, and $1.5 million on May 1, 2020 [16]. Through this public offering, New Photonics could obtain a significant amount of liquid funds, not only escaping from its financing dilemma but also

alleviating the risks associated with cash flow interruptions due to insufficient liquidity or working capital.

Table 2. Summary of New Photonics' Prospectus

Item	Details
Subscription Target	Inphi
Par Value Per Share	$0.00
Method of Subscription	1) Issue 103,734 common shares within a week after signing the R&D agreement;
	2) $4.5 million in additional common stock: Issue additional shares worth $1 million each on August 15, 2019, September 15, 2019, and February 15, 2020, and $1.5 million on May 1, 2020 to Inphi.

5 Conclusion

5.1 Key findings

This paper defines US suppliers that derive 5% or more of their operating income from Huawei as highly dependent on Huawei and those with less than 5% as lowly dependent. Using event study methodology, it analyzes market performance changes among different Huawei suppliers. The study finds that the listing of Huawei on the US Entity List, which dampens investors' willingness to buy stocks, impacts stock prices in the short term, with a more significant performance decline observed in suppliers highly dependent on Huawei. Comparing this with other events, such as Flex Ltd.'s initial refusal and later resumption of supplying to Huawei and Micron Technology resuming supplies, further illustrates that trade conflicts in the US-China trade war negatively affect US suppliers, whereas trade easing benefits their market performance changes.

After researching the overall impact of the US-China trade war on Huawei's US suppliers' market performance, this paper selects New Photonics, a US supplier highly dependent on Huawei, as a case study. The performance analysis of the case company reveals that after Huawei was added to the US Entity List, the company's revenue from the Chinese market suffered significantly. New Photonics' customer distribution also changed as a result, with Huawei's share decreasing by nearly 15% while the share of the other four major customers increased. This change in customer distribution somewhat affected the company's daily sales activities and the company's original trade routes.

The US-China trade war led to the suspension of New Photonics' Huawei orders, a downturn in the company's performance forecasts, and a slowdown in growth rates. Affected by the US-China trade war events, New Photonics' key shareholders lost confidence in the company, leading to large-scale sell-offs, and stock ratings changed in response to trade conflicts and negotiations during the trade war. Various events during the US-China trade war affected New Photonics' market performance, with the US-China trade negotiations on January 7-9, 2019, signaling a de-escalation of trade conflicts, having a positive impact on New Photonics' market performance. In contrast, the Entity List event on May 15, 2019, signaling an escalation of trade conflicts, was detrimental to the company's market performance. The adverse effects of the US-China trade war on New Photonics also manifested in the company's debt financing costs and financing scale. The US Huawei ban disrupted the company's stable cash inflow, and to alleviate short-term loan repayment pressures, the company removed Huawei from the "qualified accounts," meaning Huawei orders could no longer use the credit agreement's fund limit, leading to a significant drop in the use of revolving credit.

To counter the US-China trade war, New Photonics adjusted its business strategies. First, by developing new products and offering higher-tech products to attract new customers, it mitigated the direct impact of the US-China trade war on its business. Secondly, as the US supplier most dependent on Huawei, New Photonics began adjusting its corporate strategy from the sales side by lowering manufacturing and operational cost levels to retain Huawei as a major customer and attract potential customers from other regions, ultimately achieving favorable cash flows at lower revenue levels. Lastly, under the US-China trade war, New Photonics faced substantial conversion and exit costs after losing major customers, and short-term debt put excessive repayment pressure on the company. To withstand the risk of cash flow disruption, New Photonics opted to issue common stock for financing.

5.2 Research limitations

The study on the performance impact of Huawei's US suppliers has certain limitations. First, as an indirect entity, the long-term and short-term performance impacts of the US-China trade war on Huawei's US suppliers might be quite indirect. Additionally, changes in operating performance may take a long time to manifest. In May 2019, Huawei was added to the US Entity List, subsequently causing several US suppliers to suspend Huawei supplies. However, many US suppliers resumed partial supplies to Huawei through "temporary licenses," so the impact on operating performance might not be significant.

Second, as a leading company in China's tech sector, Huawei was heavily impacted during the US-China trade war. This paper primarily studies the performance impact of the US-China trade war on US suppliers and has not yet considered the performance impact of the US-China trade war on Huawei's Chinese suppliers.

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