St. Petersburg State University

Graduate School of Management

Master in Corporate Finance Program

IMPACT OF ECONOMIC SANCTIONS ON THE FINANCIAL PERFORMANCE OF A COMPANY: HUAWEI CASE

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Saint Petersburg

2022

ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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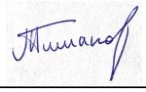

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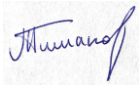

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30.05.2022 (Date)

АННОТАЦИЯ

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Факультет	Высшая Школа Менеджмента
Направление подготовки	080200 “Менеджмент” (Профиль: Корпоративные финансы)
Год	2022
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Описание цели, задач и основных результатов	Сейчас можно наблюдать тенденцию к деглобализации мировой экономики. Государства начали концентрировать свои усилия и ресурсы на восстановлении национальных экономик и поддержке местного бизнеса. Для реализации протекционной политики, государства используют различные меры: от повышения отдельных таможенных пошлин до осуществления целых государственных программ. Подобные меры направлены как на ослабление зарубежных конкурентов (введение санкционных режимов), так и на создание более комфортных условий собственным производителям. Так, одной из самый крупной жертв деглобализации стала компания Huawei. Одним из самых высоких ограничений для компании послужил запрет каким-либо предприятиям, осуществляющему свою деятельность на территории США, работать с компанией Huawei. В условиях санкционного давления компания все еще является лидером по многим направлениям своей деятельности. Цель данной работы - исследовать влияние санкций на финансовый перформанс компании Huawei. Для достижения этой цели описаны в работе были описаны и применены традиционные методы оценки финансовой деятельности компании: анализ финансовой отчетности компании, в том числе с использованием финансовых коэффициентов, а так же метод рыночных мультипликаторов. Были проанализированы ключевые рынки для компании. Была проанализирована компания на предмет того, как устроено корпоративное управление. Результаты анализа показали, что влияние санкций на финансовый перформанс компании оказались критичными только для определенного бизнес сегмента, что, в свою очередь, может оказать влияние на всю компанию в целом в долгосрочной перспективе.

Ключевые слова	Корпоративные финансы, Санкции, Финансовые коэффициенты, Оценка финансовых результатов, Метод рыночных мультипликаторов

ABSTRACT

Master Student's Name	Nikita Timakov
Master Thesis Title	“Impact of Economic Sanctions on the Financial Performance of a Company: Huawei Case”
Faculty	Graduate School of Management
Main field of study	080200 “Management” (specialization: Master of Corporate Finance)
Year	2022
Academic Advisor’s Name	Alexander V. Bukhvalov, Doctor of Physics and Mathematics Professor
Description of the goal, task and main results	We can now observe a trend toward the deglobalization of the world economy. States have begun to concentrate their efforts and resources to restore national economies and support local businesses. To implement protectionist policies, states use different measures: from increasing individual customs duties to the implementation of entire state programs. Such measures are aimed at both weakening of foreign competitors (introduction of sanctions regimes) and to create more comfortable conditions for domestic producers. One of the biggest victims of de-globalization was Huawei. One of the highest restrictions for the company was the prohibition of any company operating in the U.S. to do business with Huawei. In the face of sanctions pressure, the company is still a leader in many of its lines of business. The purpose of this paper is to investigate the impact of sanctions on Huawei's financial performance. To achieve this goal, the paper described and applied traditional methods for assessing the financial performance of the company: the analysis of the company's financial statements, including the use of financial ratios, as well as the method of relative ratio valuation. The key markets for the company were analyzed. The company was analyzed in terms of how the corporate governance is arranged. The results of the analysis showed that the impact of sanctions on the financial performance of the company was critical only for a particular business segment, which in turn may have an impact on the whole company in the long term.
Keywords	Corporate Finance, Sanctions, Accounting Ratios, Market multipliers, Relative Ratios, Financial Performance Measurement

CONTENTS

INTRODUCTION

Today's global economy tends to be anti-globalized. Increasingly, states are using protectionist measures to protect the domestic market from foreign players. Moreover, geopolitical confrontation between countries is intensifying.

The trade war between the U.S. and China, which has resulted in sanctions against Huawei in particular, is the most obvious consequence of de-globalization. This paper will analyze the effects of sanctions on Huawei, targeting Huawei's consumer and carrier divisions. Huawei is one of the leaders in the field of wearable electronics. In addition, the company is a world leader in the telecommunication equipment market. Moreover, Huawei is the leading manufacturer of 5G equipment. In 2019, the company has 91 contracts to supply 5G equipment around the world, more than any other telecommunications company, (Reuters 2020).

This paper describes the problem of estimating the impact of economic sanctions on the company. Of course, it can be assumed that the sanctions will cause a decrease in revenue, a decrease in market share in any sector. However, a preliminary analysis of the data makes it possible to assert that the impact of the sanctions on the company's activity is not so unambiguous.

Huawei's share of the communications equipment market decreased insignificantly, the company did not lose its leading position. The company's revenue declined, but the company's 2021 operating revenues increased by more than 60% and cash flow from operating activities by 70% in comparison with 2020. These examples show that the company's management made decisions that helped minimize the costs of sanctions, (Huawei Investment & Holding Co. Ltd. 2022).

The research goal is to estimate the impact of sanctions on the financial performance of Huawei, both at the level of the company as a whole, and at the level of individual business segments.

The topic of this article is very relevant in today's geopolitical environment. A number of sanctions have been imposed on many Russian companies, including in the information technology sector. Despite the fact that Huawei is a unique company, the analogues of which are quite difficult to find, Huawei's experience in overcoming the sanctions pressure may be useful for Russian companies. In addition, there is currently no suitable analysis of the impact of sanctions on Huawei's financial performance, not only in general, but also in the context of the company's key business segments. Thus, this master's thesis can offer such a scientific analysis.

This primary goal can be achieved through the following specific objectives:

1. Estimate the impact of sanctions on the company's financial performance using the accounting ratios method.

2. Estimate the impact of the sanctions on the company key business segment’s financial performance using relative ratios.

The thesis describes the main methods for assessing the financial performance of the company. A comparison of the financial performance of the company in comparison with the indicators of the previous year and in comparison with peer-companies is carried out.

The first chapter reviews the theoretical foundations of accounting performance measurement and relative ratios method.

The second chapter discusses the ownership and management structure of the company, the company's share in key markets, and analyzes the sanctions that have been imposed on the company.

The third chapter presents an analysis of the current financial position of the company, calculations of the company's financial ratios based on the methods of accounting ratios and concrete business segment enterprise value calculations using relative ratios approach.

1. Methodology for evaluating of a company's financial performance

1.1 Accounting Performance Measurement

In order to assess the performance of a company, it is necessary to define what financial performance is. There are several definitions of company performance. The performance of a company can be the ability to generate profits, to increase invested resources, to increase the value of the company, as well as to ensure future development. In addition, company performance is the ability of a company to achieve desired effects or outputs, preferably in measurable units.

After defining a key term, two key questions arise that require an answer:

1. What are the required results?

2. How to estimate (and how to measure) their performance (in what units of measurement)?

For a typical for-profit company, the most important part of measuring its financial performance is its financial ratios. Financial ratios are measured by cost criteria, which are based on financial reporting data with the greatest emphasis on making a profit using the resources received.

Based on the definition described above, profit is one of the strategic goals of the company, but it is not the main goal. It is a means to achieve the main goal and a yardstick for evaluation economic results. However, it cannot be used as the only criterion that would comprehensively estimate the company's performance, (Jakova 2019).

Financial performance indicators are used to monitor inflows (income) and outflows (expenses) and general money management in business. Traditional financial indicators consider the information that is available in the Balance Sheet, Profit and Loss Statement and the Cash Flow Statement.

The balance sheet reflects a company's assets, liabilities and equity at a certain point in time. The profit and loss statement contains information about the company's income, expenses and profit or loss by type of economic and financial activity. The notes contain information that explains and supplements the balance sheet and income statement data, (Kaplan n.d.). Cash flow statement informs about the company's income and expenses and their difference, i.e. the state of financial resources.

It is necessary to use financial ratios to estimate the company's performance and make comparative judgments about it. To identify trends in the development of the evaluated company, it is necessary to determine individual financial ratios for the period and tracking changes in their values over time. Moreover, it is possible to compare financial indicators with those of the main

competitors to determine how the company operates under sanctions in comparison with other companies in similar conditions or is engaged in similar activities.

We must also take into account the fact that the company that is the subject of this thesis is not listed on a stock exchange, so it is necessary to use accounting ratios or corporate finance ratios, but only those that relate to the financial report, not to market information.

To measure and assess a company's ability to generate income (profit) in relation to revenue, balance sheet assets, operating expenses, and equity capital over a period of time, Profitability Ratios must be used. Profitability ratios include margin and return ratios. Margin ratios represent the company's ability to convert sales into profits.

Gross profit margin - compares gross profit to sales revenue. It shows how much a business earns, taking into account the necessary costs of producing goods and services. A high gross profit margin reflects higher operating efficiency, which means that the business can cover operating expenses, fixed costs, dividends, and depreciation while providing a net profit. On the other hand, a low profit margin indicates a high cost of goods sold, which may be due to unfavorable purchasing policies, low selling prices, low sales, stiff market competition, or improper sales promotion policies, (Corporate Finance Institute n.d.).

$$Gross\ Margin\ Ratio = \frac{Total\ Revenue - COGS}{Total\ Revenue} \tag{1.1}$$

Net margin measures how successful a company has been at the business of marking a profit on each dollar sales. It is one of the most essential financial ratios. Net margin includes all the factors that influence profitability whether under management control or not. The higher the ratio, the more effective a company is at cost control. Compared with peers, it can show how well the management are performing under the sanctions, (Corporate Finance Institute n.d.).

$$Net\ Profit\ Margin = \frac{Net\ Profit}{Total\ Revenue} \tag{1.2}$$

Return on Assets (ROA) - can measure the profitability of a business relative to its total assets. This coefficient shows how well the company is performing by comparing the profit (net income) received with the total capital invested in assets, (Corporate Finance Institute n.d.).

Different industries have different return on assets. Industries that are capital intensive and require a high value of fixed assets to carry out operations tend to have lower return on assets because of their large asset base increased the denominator of the formula.

$$ROA = \frac{Net\ Profit}{Total\ Assets} \quad (1.3)$$

Return on Equity (ROE) is a measure of a company's profitability. It shows how much profit a company has made over a certain period of time, corresponding to the total equity capital shown on the balance sheet. Return on equity is the amount of profit earned for every dollar of shareholder equity. This ratio shows how effectively the management committee uses equity capital to finance the growth of the company's business, (Corporate Finance Institute n.d.).

$$ROE = \frac{Net\ Profit}{Shareholders\ Equity} \quad (1.4)$$

The leverage ratio is a group of financial indicators that can be used to determine how much capital comes in the form of debt (loans). That is, leverage ratios help assess a company's ability to meet its financial obligations. Knowing the leverage ratio is necessary to understand whether a company will be able to pay its debts on time.

The Debt Ratio, also known as the Debt to Asset Ratio, can be used to calculate the percentage of assets that are financed by debt. A high ratio indicates a high degree of financial risk. The debt ratio is usually used by creditors to determine the amount of debt a company owes, its ability to repay the debt, and to determine whether the company will be granted additional loans. In addition, the ratio helps verify the company's solvency, its ability to meet current and future obligations, and whether it can recover its investments, (Corporate Finance Institute n.d.).

$$Debt\ Ratio = \frac{Short\ Term\ Debts + Long\ Term\ Debts}{Total\ Assets} \quad (1.5)$$

Liquidity ratios can be used to measure a company's ability to repay its liabilities.

Current Ratio - This is the ratio of current assets to current liabilities. The ratio measures a company's ability to meet its short-term liabilities payable within one year, with current assets to be converted into monetary assets within one year. For a company with good performance, the ratio should exceed 1, but the expected ratio varies depending on the type of industry.

If the ratio drops from year to year or is below the industry average, it could be an indication of liquidity problems for the company. To increase the ratio, the company must take steps to improve liquidity, such as by paying off accounts payable as they fall due or by managing liquidity better. The company needs to convert money into cash more efficiently.

Equally, a high ratio may indicate that surplus cash is being inefficient use. Cash is not generating income, so it should be reinvested in the business, (Corporate Finance Institute n.d.).

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities} \tag{1.6}$$

The Efficiency Ratios is used to measure how effectively a company uses its assets and resources. The inventory turnover ratio is an efficiency ratio that measures how well a company can manage its inventory. A high ratio indicates a decrease in storage and other costs associated with inventories, (Corporate Finance Institute n.d.).

$$Inventory\ Turnover\ Ratio = \frac{COGS}{End\ of\ period\ Inventory} \tag{1.7}$$

1.2 Relative Valuation Model as a tool to estimate company's financial performance

Multipliers are derived financial ratios. With the help of multipliers, it will be possible to estimate the market value of company's equity and trace the dynamics of its change.

Using relative valuation method, the value of a company is derived from the pricing of comparable companies (either enterprise value or market capitalization), standardized using a common variable such as earnings, cash flows, book value, or revenues, etc. The main assumption of this approach is that the firms in the industry are comparable to the firm being valued and that the market, on average, prices these firms correctly, (Damodaran 2012).

Moreover, this method would be suitable for assessing the performance of individual segments of the company. For example, if we assume that the share of a particular segment's net profit, EBITDA, assets, liabilities and equity correspond with segment's revenue share in total revenue, we can estimate the market value of the equity of each of the segments. The Carrier and Consumer segments will be taken as evaluated segments. Together, these segments accounted for about 85% of the company's total annual revenue in 2021.

To calculate the market value of a company segment's equity, we need to use market information from peer companies. For the Consumer segment such companies will be Samsung (only its mobile segment), Apple, Xiaomi – together they have 53% of smartphone global market share. These companies, just like Huawei, in addition to smartphones, produce personal computers, laptops, tablets, peripherals and accessories. Therefore, with the help of these companies we can objectively assess the market value of the Consumer segment's equity. Nokia,

Cisco and Ericsson were chosen to assess the market value of equity of the Carrier segment. Together they occupy 38% of the world market of telecommunications equipment.

P/E, P/S, P/BV and EV/EBITDA will be used to estimate the market value of the company's equity. From the obtained results the weighted average will be found, in order to obtain more objective results.

The P/E multiple shows how many years a company has to be in operation, earning the same profit, in order to recoup equity capital. To calculate P/E you need to know earnings per share (EPS). EPS shows how much a company earns per share, and is calculated as the ratio of net income to the number of shares outstanding. Market value per share is essentially the price of a company's stock on a stock exchange. In our case, the Market value per share will be calculated as the ratio of the market capitalization of the company to the total volume of common shares outstanding, (Damodaran 2012).

$$Earnings\ per\ Share = \frac{Net\ Profit - Preferred\ Dividends}{End\ of\ period\ Common\ Shares\ Outstanding} \quad (1.8)$$

$$Market\ Capitalization = Common\ Shares\ Outstanding\ \times Share\ Price \quad (1.9)$$

$$P/E = \frac{Market\ Value\ per\ Share}{Earnings\ per\ Share} \quad (1.10)$$

Then, in order to find the estimated market value of the company's equity from the resulting P/E ratio, a different kind of P/E formula must be used.

$$P/E = \frac{Market\ Capitalization}{Net\ Profit} \quad (1.11)$$

The P/S multiple is equal to the company's capitalization to annual revenues and shows how much annual revenues the company is worth, (Damodaran 2012).

$$P/S = \frac{Market\ Capitalization}{Total\ Revenue} \quad (1.12)$$

The EV/EBIDA multiplier shows how much profit before interest, taxes, and depreciation the company must earn to recoup the real market price of the company.

Enterprise value (EV) is the measure of value of the company, that taking into account the debt burden and money to pay it off. This is the price at which a company can be bought. EV can be calculated as follows: the share price can be multiplied by the number of all outstanding shares and to that value add all of the company's debt obligations, and then subtract the company's cash, (Damodaran 2012).

$$EV = Market\ Capitalization + Debt - Cash + Minority\ Interest \quad (1.13)$$

EBITDA (Earnings before interest, taxes, depreciation and amortization) is a company's earnings before interest, taxes, depreciation and amortization.

It can be used to assess a company's creditworthiness - whether it has the funds to pay interest. EBITDA also shows a company's ability to incur capital expenditures: expenditures on non-current assets with a maturity of more than a year - the purchase of equipment, vehicles, real estate, licenses, and other things, (Reuters 2012).

Earnings (E). Although there is no single method of calculating EBITDA, the Securities and Exchange Commission (SEC) has clarified a few points. According to its rules, earnings means net income, i.e. net profit. It must be presented in the profit and loss statement, (U.S. Securities and Exchange Commission 2003).

Interest (I) - interest expense. Most often this is the interest on loans that the company is servicing. In addition, companies can borrow money by selling their bonds. Investors who buy these securities receive coupon payments.

Taxes (T) is an corporate income tax.

Depreciation (D) is the transfer of the cost of fixed assets to the cost of production as a result of depreciation and reduction in the value of the asset, its revaluation. A straight-line depreciation assumes that the value of an asset decreases gradually over its useful life. And a certain percentage is deducted each year from the cost of the asset. For example, a company bought equipment for $100 million and it has a useful life of 20 years. Over time, the equipment will wear out, and its value, prescribed in the reports, will decrease. At the same time, the amount by which the cost has decreased will be recorded as an expense. If depreciation is calculated evenly, $5 million per year will be recorded as an expense.

Amortization (A) is amortization, that is, a straight-line transfer of the value of intangible assets to expenses. For example, a company has a license that is valued at $20 million. The term

of the license is ten years. Then the company will expense $2 million each year in the form of amortization, which will reduce the company's profit by that amount.

Thus, the EBITDA formula is as follows.

$$EBITDA = Net\ Profit + Taxes + Interest\ Expense + Depreciation\ \&\ Amortization \quad (1.14)$$

The Price to Book Value (P/BV) multiplier shows the ratio of a stock's price to its book value. Book value is the value of net assets minus total debt. The money that shareholders would divide among themselves if the company sold off after all debts were paid, (Damodaran 2012).

$$P/BV = \frac{Market\ Capitalization}{Book\ Value\ of\ Equity} \quad (1.15)$$

However, it is worth bearing in mind that ratios are not equally suitable for assessing the value of the company. Therefore, it is worth giving different weight to each of the parameters, depending on the ability of this or that ratios to adequately reflect the dynamics of the value.

P/E ratio has a number of advantages, but we should not forget that the key component of this ratio is Earning per Share. As mentioned above, EPS is the Net Profit of the company divided by the number of shares outstanding. Investors often are interested in the increase of EPS from year to year, therefore the company management needs to increase this indicator. The value of EPS can be manipulated either by adjusting net profit or the number of outstanding shares.

A company can manipulate the net profit bit by capitalizing expenses and amortizing them over time. The capitalization process moves the expenses incurred to the asset section of the balance sheet, and then that asset is amortized over a longer period of time.

The company can also make adjustments to the number of shares outstanding. This can be done in two ways. Share repurchases – a company repurchases its shares, it reduces the number of shares outstanding and thereby increases EPS, without necessarily showing an increase in earnings. Issuing stock options to executives – a company can also disguise the issuance of stock options to reward executives by repurchasing its stock; this ensures that when the options are exercised, it will not decrease the value of the common stock.

P/BV also has a number of drawbacks that can affect the adequate valuation of a company using this ratio. First, P/BV is not very suitable for evaluating high-tech companies, which both Huawei and its peers are. This is because a high proportion of the assets of such companies are intangible assets (technology, patents, brand), which are difficult to value. Second, book value

depends on accounting decisions about depreciation and other variables. When accounting standards vary widely among firms, the ratio of price to book value may not be comparable among firms.

The key disadvantage of P/S ratios is that a dollar of sales from a high-margin firm is worth more than a dollar of sales from a company with a lower rate of return. That is, this ratio should be used to compare firms of comparable size. Moreover, ratio doesn't take into account whether the company makes any profit.

The key feature of EV/EBITDA over those ratios described above is that EBITDA is less susceptible to manipulation by business managers using accounting and financial manipulation. It removes factors that owners and managers can control and reveals the basic operational health of the business. Therefore, this factor will be given the most weight.

Below is a table with weights for each of the ratios to calculate the weighted average enterprise value for Huawei company.

Table 1 – Relative Ratios weight

Relative Ratio	Weight
EV according to P/E ratio	0,2
EV according to P/S ratio	0,2
EV according to P/BV ratio	0,1
EV according to EV/EBITDA	0,5

To find the value of a particular segment, the average values of the presented ratios of peer companies will be find. Then value of the Huawei segment by multiplying the common variables (Revenue, Net profit, EBITDA, Book Value of Equity) by the resulting average value of the ratio will be calculated. After that, if it is the market value of equity, that is, market capitalization, it will be adjusted by the amount of net debt. From the obtained values of Enterprise value from different ratios, the EV of the segment will be calculated using a weighted average.

2. Case Description

2.1 Company’s Description

Huawei Technologies Co. Ltd is a Chinese company, a leading global provider of information and communications technology (ICT) infrastructure and smart devices. The company was founded in 1987. The company has approximately 195,000 employees operating in more than 170 countries and regions, serving more than three billion people worldwide. The company is headquartered in Shenzhen, China.

Huawei Technologies is wholly owned by its holding company named Huawei Investment & Holding, which implements an employee shareholding scheme through its trade union, and it is owned approximately 99 % of the share by employees.

Huawei is required to concentrate all employee stock in its union. In addition, there is a restriction on the issuance of ordinary shares to employees, so the shares owned by employees are issued as phantom shares, which are vested with the rights of the shareholder, including dividends, voting rights and ownership rights. All of this takes place within the framework of the Company Law of the People's Republic of China.

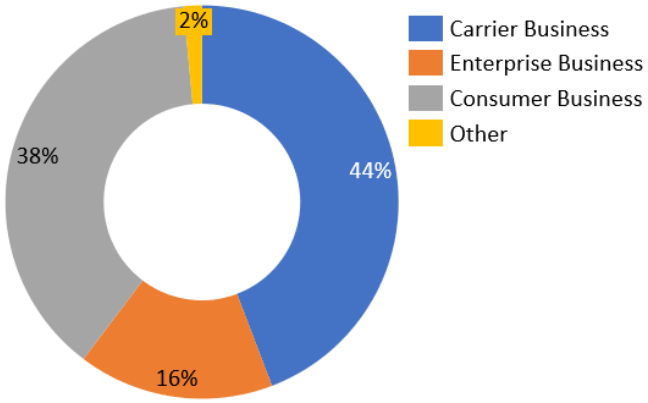
The highest decision-making body at Huawei is the Employee Shareholder Representative Committee, which represents the employee shareholders and exercises their rights through their elected representatives. The employee shareholders vote one vote per share, while the representatives vote one vote per person. Ren Zhengfei, as the founder of the company, has the right to veto, but he can use this right within the limits set by the internal rules.

Huawei's corporate structure is following: The Board of Directors (BoD) is the highest authority responsible for corporate strategy, operations management, and customer satisfaction. The Board of Directors and its Executive Committee are chaired by rotating chairs. During its term, the rotating chairs serve as the company's principal leader. As Huawei's supreme supervisory body, the Supervisory Board provides oversight on behalf of the company's shareholders. Its core powers include leadership management, business reviews and strategic vision, (Goto 2021).

Huawei's operations are organized around three key divisions that generate the majority of the company's profits.

Carrier Business provides wireless networks, fixed networks, global services, carrier software, core networks and network energy solutions. Enterprise Business works to support the company's corporate/industrial customers. Consumer Business - a group of departments that provide services and products for the consumer sector: smartphones, notebooks, operating systems, applications, etc.

Among other things, the company has divisions that are not that big in the company's revenue structure. For example, Huawei Cloud is responsible for the end-to-end operations and commercial success of Huawei Cloud services, and develops related organizations and capabilities, including R&D, sales, consulting, service and delivery. Intelligent Automotive Solution BU is the comprehensive organization responsible for the company's intelligent automotive business. HiSilicon is a provider of a wide range of chipsets and modular solutions for sensors, connectivity, computing and displays serving a variety of markets, including smart devices, display panels, consumer electronics and automotive electronics. The company is engaged in research and development, marketing, ecosystem development, and sales and service of chipsets and modules. It is independently responsible for its performance, risk management, market competitiveness and customer satisfaction.



Graph 1 – Huawei's Revenue by core segments

2.2 Analysis of sanctions to Huawei

As of 2019, Huawei is the market leader in telecommunications equipment with the share of 28%. Changes in the development vector of diplomatic and foreign economic relations between the U.S. and China led to the so-called trade war between the countries. Since Huawei is one of the largest Chinese companies and the company that provides telecommunications networks not only in China, but also in the United States and around the world, the company was subjected to sanctions.

The dominant position in the telecommunications equipment market did not suit the American authorities. There were grounds for the fact that Huawei could use backdoors in its systems to carry out espionage activities in the interests of the China. The reason for this was not only the National Intelligence Law of the People's Republic, which obliges private companies,

including private ones, to work in the interests of the state and perform intelligence work, but also the results of the Australian Communications Authority's investigation.

The Australian Signals Directorate found that the offensive potential of 5G was quite large, and that 5G could be used to spy on and sabotage critical infrastructure. About six months after the discovery, the Australian government effectively banned Huawei, the world's largest manufacturer of telecommunications network equipment, from any involvement in its plans to deploy 5G in Australia, (Reuters 2020).

After the Australia investigation was published, other countries (include U.S.) began to impose restrictions on Huawei. These restrictions included not only restrictive legislative measures, but also economic sanctions imposed on the company.

The first step in adopting sanctions against Huawei was the signing of the National Defense Authorization Act for Fiscal Year 2019 (NDAA 2019), which contained a provision prohibiting the U.S. federal government from using Huawei and ZTE equipment, citing security concerns.

The most important factor, however, was the addition of the company's U.S. division and its non-U.S. affiliates to the list of entities whose activities are "contrary to the national security and national interests of the United States", (Bureau of Industry and Security, Commerce 2019).

This decision led to the fact that American companies stopped doing any business with Huawei and all of its subsidiaries. Among others, such players as Inter, Qualcomm, ARM, Google, Microsoft and Broadcom refused to work with the company.

The loss of partners such as Google and Arm is a significant blow to the Consumer BG division. The Consumer BG business generates 54% of Huawei's revenue. Google's rejection of the partnership led to a ban on Google Mobile Services. Although the android operating system has an Open Source license, which means that it is available for use, many services are tied to APIs developed by Google. Google Mobile Services is a set of APIs that are pre-installed on android devices and that improve the user experience of using the operating system. In the Chinese market the problem of the lack of APIs is not so significant, because Google has not been represented in the Chinese market since 2012. But in the case of the rest of the world, the absence of branded services from Google often leads to refusal to buy a phone from Huawei. For example, Google's share of the mapping services market is 67%. Google's share of the payment services market is over 37.5%. Moreover, Google Mobile Services also includes the Google Play app store, through which more than 111 billion Android apps have been downloaded as of 2021, (Ceci 2021).

In addition to the problems that relate to the software part, there were problems related to the hardware part because of the sanctions. Huawei has a division called HiSilicon Technologies Co. One of the segments of this division is the production of microprocessors for smartphones. A feature of the development cycle is that the processors are developed using a license from ARM.

ARM is a British company which provides the architecture (instruction system) used by developers to create the processors.

The development of HiSilicon Technologies Co. processors has been threatened by the fact that the company cannot produce processors directly, so it outsources production. The largest chip manufacturing partner was TSMC. Since the company uses U.S.-made technology in its work, it has ceased cooperation with Huawei.

Now HiSillicon cannot produce processors with technology more perfect than 28nm, while the modern technology is the production on the 7nm process. Of course, this affects the competitiveness of the company's devices not only outside of China, but also in mainland China itself. This can explain the critical decline in the company's share of the smartphone market in China, (Gizchina 2020).

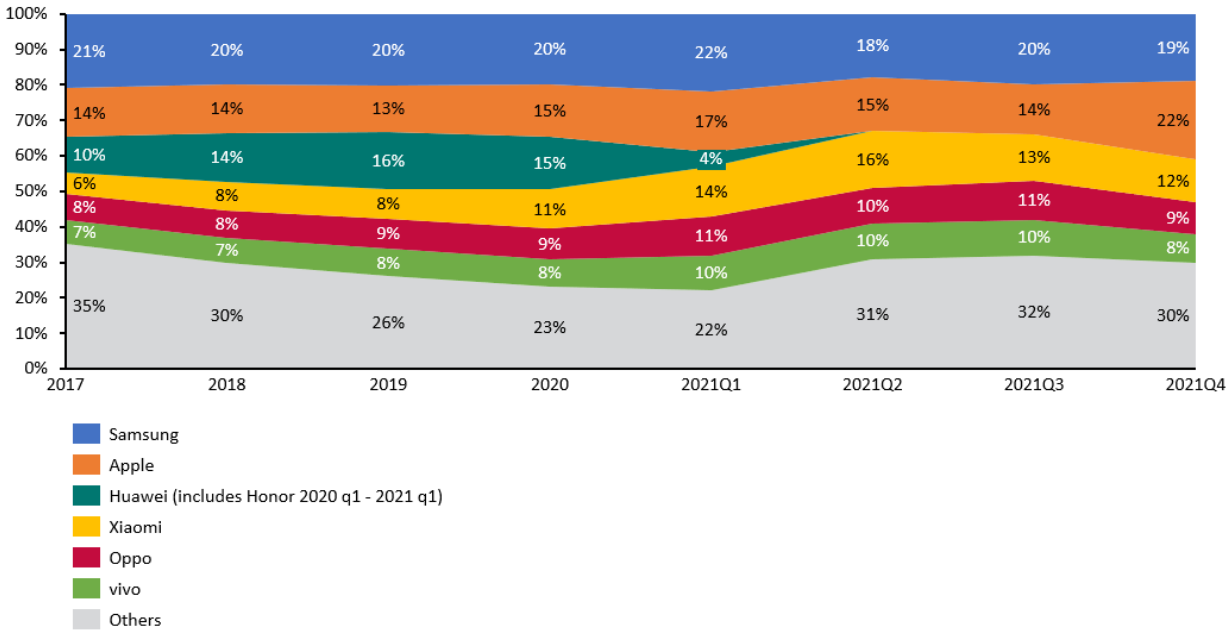
However, all of these restrictions described above did not come into force until April 2020 due to the fact that their implementation was postponed three times. Thus, the first full year under sanctions is 2021.

2.3 Market Analysis

The stages and types of sanctions pressure on Huawei were described above. In order to assess how Huawei's share of this or that market has changed, it is necessary to outline which markets are of interest for analysis. According to the company's 2021 report, the two most important categories in Huawei's revenue structure are consumer electronics and telecommunications equipment (occupying 38% and 44% of the revenue structure respectively). Therefore, to assess the impact of sanctions on Huawei, it is necessary to estimate the company's market share in each of the segments described.

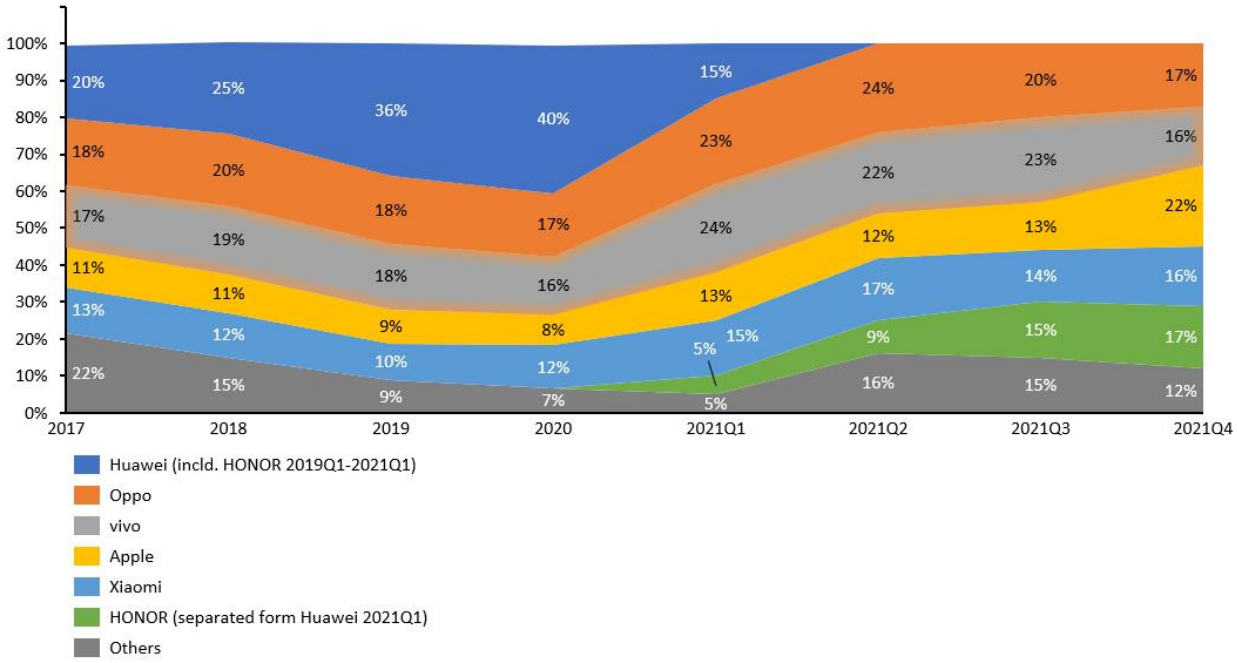
Customer segment includes smartphones, laptops, wearable devices, audio and video equipment. Since the mobile electronics segment (smartphones, tablets) has felt the greatest effect of sanctions, it is necessary to consider the dynamics of changes in the share of Huawei among smartphone manufacturers in the world and in China.

The chart below shows the dynamics of global smartphone shipments in the world. Thus, from the first quarter of 2017, the company was in the top 3 in terms of global smartphone market share and even occupied the second position in the global smartphone market in 2019. However, since the last quarter of 2020, there has been a significant decline. This decline can be explained by the sanctions applied to the company. Huawei's share in the first quarter of 2021 decreased to 4%, and in the second quarter it dropped to less than 1%.



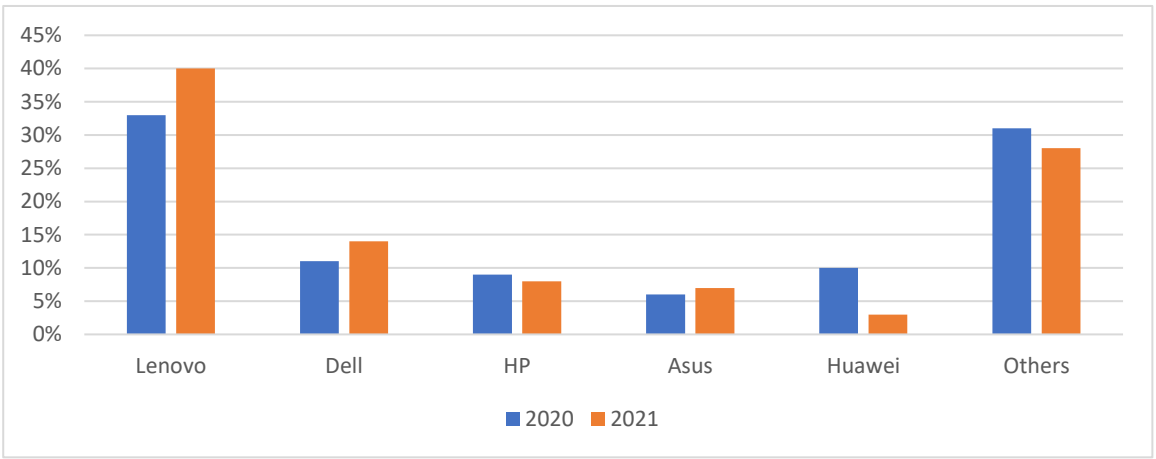
Graph 3 – Worldwide Smartphone Shipment Market share

Based on the chart below, which shows the share of smartphone sales in China, we can conclude that Huawei was the leader among smartphone manufacturers. Together with BBK holding company (OPPO, vivo, realme brands), the company sold up to 45% of smartphones in mainland China, (Counterpoint 2022). However, in the first quarter of 2021, the company's share dropped significantly. This is definitely due to the sanctions pressure on the company. However, the direct impact of sanctions cannot be overestimated. Google's refusal to license new smartphones to provide APIs was not critical for Huawei in mainland China, as Google services have been blocked in China for more than 10 years. Much of the significant decline in share is due to the inability of ARM to license the processor architecture for new smartphones, as well as the prohibition of TSMC to produce processors using modern technological processes. Under such conditions, Huawei decided to sell its sub-brand, HONOR.



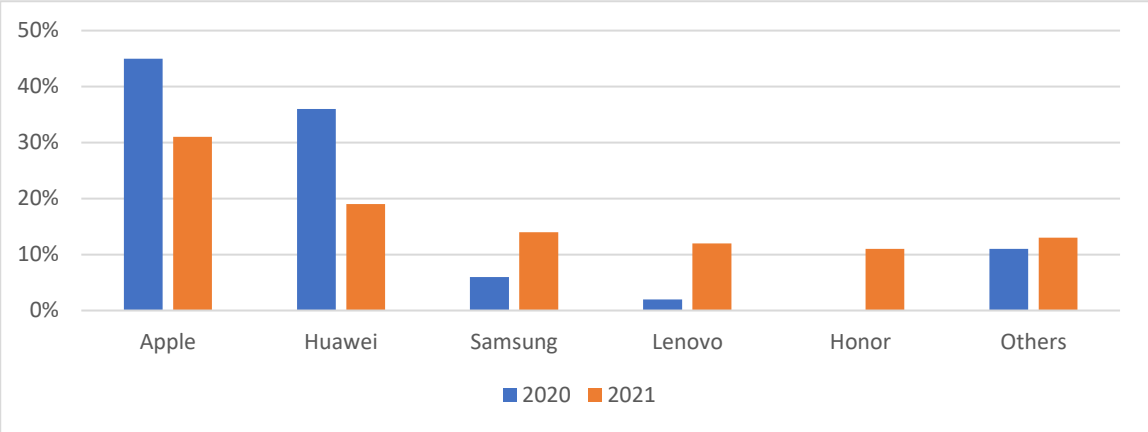
Graph 4 – Mainland China Smartphone Shipment Market share

The situation is similar on the personal computer market in China. Huawei's share has decreased by 64%. However, we should take into account the fact that the production of personal computers has not been subjected to the same sanctions as the production of smartphones. Thus, Huawei continues to use processors from the Chinese firm AMD and the Windows operating system from Microsoft. The biggest factor reducing Huawei's share in the PC market is the sale of Honor, (Canalys 2021).



Graph 5 – Mainland China Personal Computer Shipment Market share

In support of the above thesis, the graph below shows that Huawei's share of the tablet market has fallen by about the same amount that HONOR now holds. But in spite of this, Huawei is still the 2nd largest seller of tablets in mainland China. With an overall market decline of 24%, (Canalys 2021).

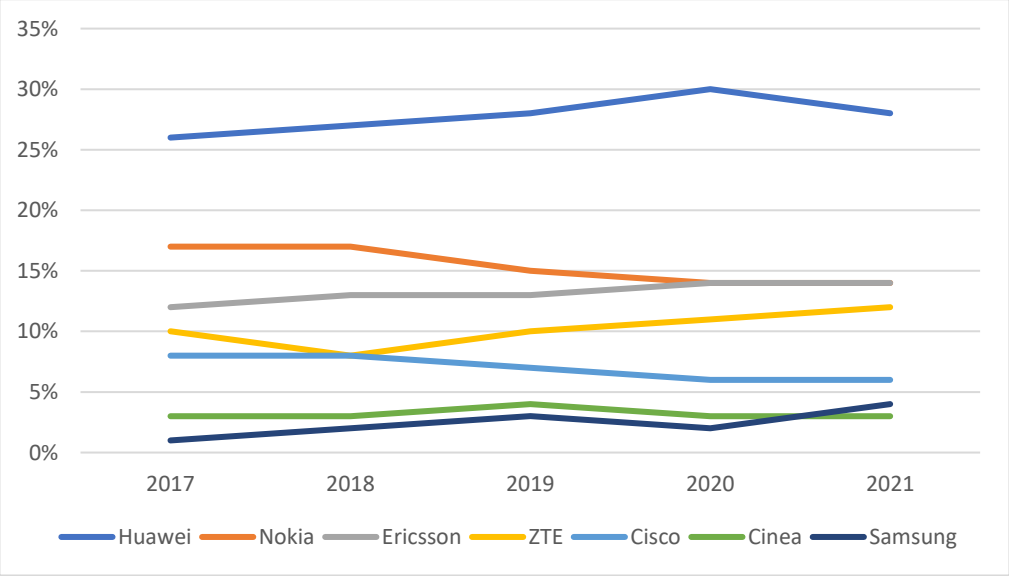


Graph 6 – Mainland China Tablet Shipment Market share

The telecommunications equipment market includes broadband access, microwave and optical transport, mobile core network (MCN), radio access network (RAN) and SP routers and switches.

The collective global share of the top vendors will remain relatively stable in 2020-2021, with the top seven vendors accounting for about 80% of the total market.

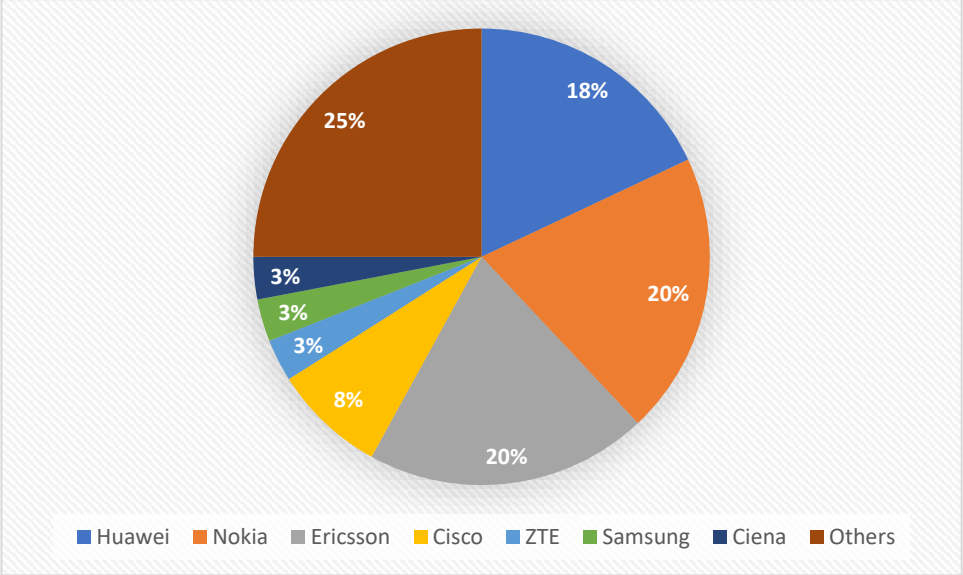
Huawei's share, as seen in the chart below, remains at a consistently high level. From 2017 to 2020, the telecom equipment market share grew from 26% to 30%. After 2020, the trend reversed and Huawei's market share began to decline. However, despite this decline, Huawei still maintains a significant lead over competitors such as Ericsson and Nokia, with a share of 16% for both companies.



Graph 7 – Worldwide Telecom Equipment Revenue

In many ways, Huawei's success in the international market - is the result of success in the domestic Chinese market, the depth of its telecommunications portfolio and the sustainability of its existing presence. China's share of the telecommunications equipment market is 26%, the largest share of any country.

Excluding China, most of the global market is shared by the "big three vendors": Ericsson and Nokia with 20% each and Huawei with 18%. In fourth place is Cisco. ZTE, Samsung and Ciena have equal shares - all three have about 15% of the market, (Pongratz, Key Takeaways – 2021 Total Telecom Equipment Market 2022).

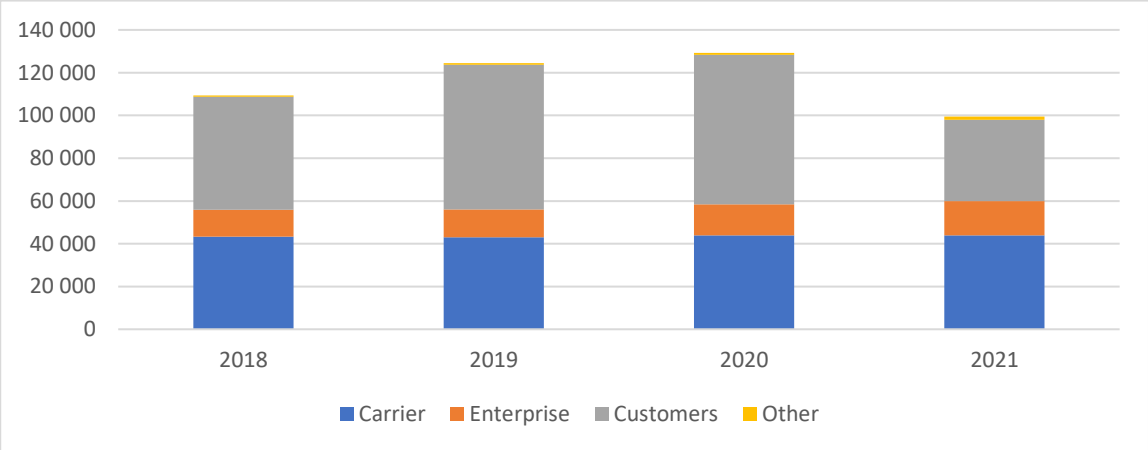


Graph 8 – Excluding China Telecom Equipment Revenue

3. Estimation of Huawei's Performance

3.1 Accounting Performance Review

The main sanctions against Huawei were imposed in 2019, but because the legislation was delayed and did not come into force until 2020. Thus, we can observe that the company's revenue declined in 2021, the first full-fledged subsanction year. In the 3 years between 2018 and 2020, revenue increased by 18%. Growth in 2020 had already slowed enough to 4%. However, in 2021, revenues fell 23% and rolled back to 2017 levels. This significant decline is due to a nearly 50% drop in revenue in the Consumer business and a 7% drop in the Carrier business.



Graph 9 – Huawei's Revenue, million USD

At the same time, the company's operating profit increased significantly (by 40%) in 2021 compared to 2020. This significant increase was due to the fact that Huawei received income from the sale of its two subsidiaries in 2020. In November 2020, the company sold its HONOR division, which manufactures and sells consumer electronics. This decision was due to sanctions pressure on Huawei and the inability, because of this, to ensure the competitiveness of its product line because of problems with contracts for advanced computing equipment and software. Huawei Investment & Holding Co., Ltd. decided to sell all its Honor business assets to Shenzhen Zhixin New Information Technology Co. After the completion of the sale, Huawei has no shares and no participation in business management or decision-making in the new Honor company. In addition, the company sold 100% of the equity interests in the xFusion subsidiary to a third party purchaser in 2021. xFusion is engaged in the manufacture and sale of server products. The transfer of the related assets and liabilities was completed in 2021.

Since such income may materially distort the analysis of financial performance, the calculation of account ratios below will be adjusted for the amount of these Other Income.

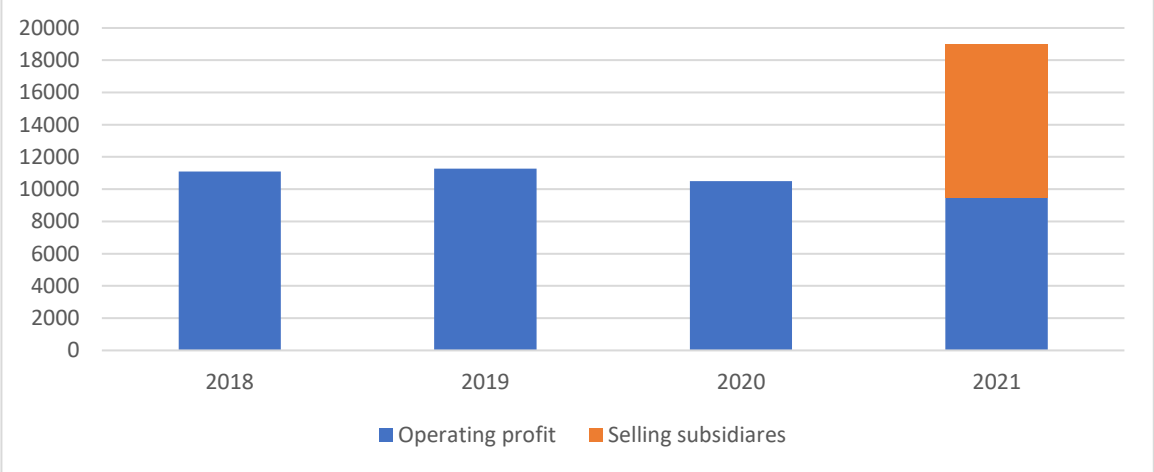
The fact is that even though the profit and loss statement showed the amount of the two transactions, the company did not receive the full amount of money in its account. The structure of the deals is not disclosed, but it is known that the payments for the marks will be postponed in time. It is known that Huawei sold HONOR at the end of 2020. However, the transfer of assets related to the Honor business has been delayed due to the COVID-19 pandemic and have fully completed at 2021. That is, the transaction was partially reflected in the 2020 and 2021 balance sheets. However, most of the proceeds received were reflected in the 2021 income statement.

The financial instruments resulting from both transactions, representing a financial asset and a financial liability respectively, were measured at fair value through profit or loss statement. And they were included in Other assets and Other liabilities as of December 31, 2021 at book value.

Comments on the balance sheet accounts indicate that the book value of assets held for sale was about $660 million. At the same time, the income received from the sale of these assets and reflected in the profit and loss statement amounted to 9,5 billion U.S. dollars.

For a more accurate assessment of the company's financial performance and to avoid incorrect results, as a necessary adjustment for future calculations of both account ratios and relative ratios, it was decided to exclude the item Other Income from the profit and loss statement for 2021. That is, adjust the amount of operating profit by the amount of Other income, which, in turn, will be reflected in the indicator of net profit, EBIT and EBITDA. They will decrease in the same way.

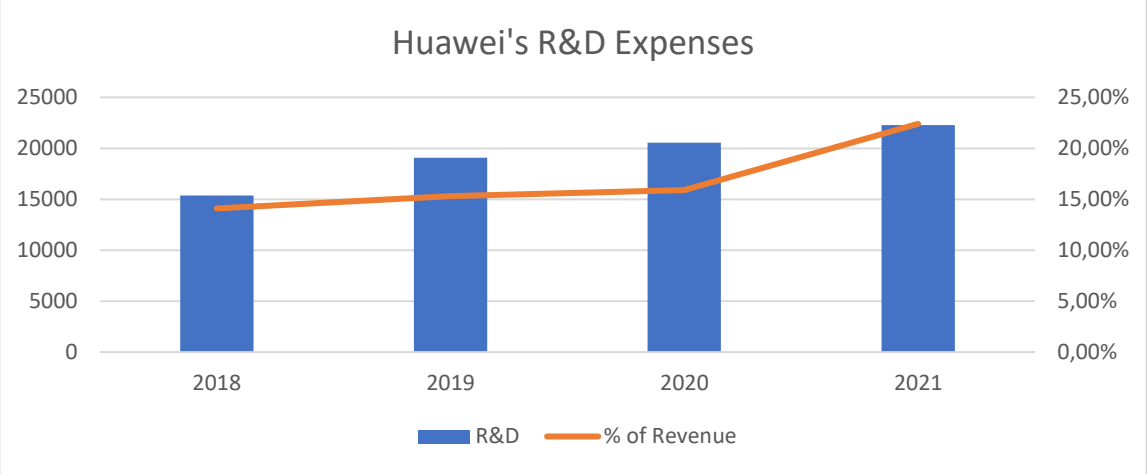
$$Adjusted\ Operating\ Profit\ (2021) = Operating\ profit - Other\ income \quad (3.1)$$
$$= 18\,970 - 9\,500 = 9\,470$$



Graph 10 – Huawei's Operating Profit, million USD

Thus, taking into account the above-mentioned adjustments, we can observe a steady decline in the company's operating income starting in 2020. This is definitely due to the effect of sanctions.

But, despite the sanctions, the company's R&D expenditures per revenue increase from year to year. In many respects it is a forced measure, as the company is forced to develop new software in order not to lose the consumer electronics market, as well as to become more stable for further expansion of the 5G networks market. R&D investment was increased in 2021 to $22 billion, representing 22.4% of the company's total revenue. Huawei's R&D spending and R&D spending ratio has reached the highest levels in the last years.



Graph 11 – Huawei's R&D Expenses, million USD

As described above, this paper will compare Huawei's pre- and post-sanctions ratios with those of its peers based on current reporting. The main package of sanctions against Huawei, although adopted in 2019, did not take effect until 2020. That is, the pre-crisis ratios are those for 2018 and 2019. The year 2020 should be evaluated as a tipping point. 2021 is the marker year by which the impact of sanctions will be measured. The indicators of company accounts will be taken for 2021. Results of calculations of all relevant ratios are presented in Table 1 of Appendix 3.

To estimate the company's performance, it is necessary to compare it with other companies that operate in a similar field and in similar markets. Moreover, in order to estimate the effectiveness of a company that is under sanctions, it is necessary to compare it with companies that are not under sanctions - reference companies.

As reference companies were chosen those that operate either in the market of telecommunications equipment or in the market of consumer electronics, or in both industries.

In the first case, Nokia, Ericsson and Cisco should be taken as benchmarks. These companies are leaders in the global market of telecommunications equipment, second only to Huawei.

Nokia is a Swedish multinational company operating in more than 130 countries. The company operates in five business areas: Mobile Network (responsible for the deployment of 5G networks), Network Infrastructure, Cloud, R&D, Strategy and Technology. Ericsson is one of the leading providers of information and communications technology (ICT) to service providers. Cisco is a U.S. multinational company that develops and sells networking equipment designed primarily for large organizations and telecommunications enterprises.

To compare Huawei's activities in the consumer electronics segment, we should use those companies that deal only in consumer electronics, not telecommunications equipment.

A more appropriate comparison might be BBK. BBK Electronics Corporation is a Chinese multinational conglomerate. The company makes electronics such as televisions, MP3 players, digital cameras and smartphones. It is one of the world's largest manufacturers of smartphones, a developer and manufacturer of consumer electronics and related software, home appliances and household items. After Samsung, it is the second-largest smartphone maker. However, the company's reporting is not in the public domain. Therefore, it is necessary to use the data of other major players: Samsung, Xiaomi, Apple. Samsung is a South Korean group of companies, one of the largest chaebol (Korean industrial conglomerate). It is known in the global market as a manufacturer of high-tech components, including full-cycle production of integrated circuits, telecommunications equipment, home appliances, audio and video devices. For research, this company is interesting only as a manufacturer of mobile electronics, so the only mobile segment data will be used. Xiaomi is a Chinese corporation, the world leader in smartphone production (sales) in 2021. Apple is the largest producer of consumer electronics. Before sanctions were imposed, Huawei shared second place by the number of smartphones sold in the world. Apple is an American company that is also active in China. Being a competitor to Huawei both globally and locally. Moreover, Apple is not subject to sanctions, so its performance will be most obvious when compared to Huawei.

In addition, we can compare Huawei's financial performance with that of ZTE, which operates in similar business segments and has been subjected to similar sanctions pressure.

ZTE Corporation is a Chinese partially state-owned technology company specializing in telecommunications. Founded in 1985, ZTE is listed on the Hong Kong and Shenzhen stock exchanges. ZTE is engaged in carrier networks, terminals and telecommunications. Its main businesses are wireless communication, data transmission, optical transmission,

telecommunications data transmission equipment, telecommunications software and cellular phones.

When comparing financial performance based on account ratios, one should compare the average performance of non-sanctioned companies as a benchmark and separately with the performance of ZTE. This will help there not only to compare the performance of companies with and without sanctions pressure, but also to assess how much sanctions pressure has been overcome by two companies similar in type of activity, which will help understand how satisfactory Huawei's performance is in the current environment.

Table 2 shows Huawei's account ratios calculations from 2018 to 2021. Table 3 shows the calculations of accounting ratios of benchmark companies (ZTEs and averages of non-sanctioned companies) for the same time period.

Table 2 – Huawei's accounting ratio from 2018 to 2021

Huawei	Gross Margin Ratio	Net Margin	ROA	ROE	Current Rato	Debt Ratio	R&D/Revenue	Inventory Turnover Ratio
2018	39%	8%	9%	26%	1,48	65%	14%	4,69
2019	38%	7%	7%	21%	1,58	66%	15%	3,24
2020	37%	7%	7%	20%	1,76	62%	16%	3,37
2021 *(Adjustment on "Other Income")*	48%	18% *(8%)*	12% *(5%)*	27% *(13%)*	1,96	58%	22%	2,04

The data in Table 2 are calculated by formulas 1.1 – 1.7 based on data from Table 1 of Appendix 3.

Table 3 – Peer-companies' accounting ratio

	ZTE				Market Average			
	2018	2019	2020	2021	2018	2019	2020	2021
Gross Margin Ratio	32,9%	37,2%	31,6%	35,2%	38,1%	37,3%	39,0%	41,2%
Net Profit Margin	-7,7%	6,1%	4,2%	5,9%	7,3%	9,8%	9,8%	14,0%
ROA	-5,1%	3,9%	2,8%	4,0%	5,9%	6,8%	7,3%	10,9%
ROE	-19,9%	14,5%	9,3%	12,8%	13,8%	19,8%	24,0%	38,9%
Current Rato	1,04	1,19	1,44	1,63	1,73	1,68	1,70	1,61
Debt Ratio	74,5%	73,1%	69,4%	68,4%	56,2%	58,5%	58,7%	57,1%
Inventory Turnover Ratio	2,29	2,06	2,06	2,04	11,77	12,33	12,68	10,40

The data in Table 3 are calculated by formulas 1.1 – 1.7 based on data from Table 1 of Appendix 4.

Gross Margin Ratio remained constant from year to year, but in 2021 it increased by more than 10% compared to the previous year. This increase is significant and is caused by the fact that in 2021 COGS was significantly reduced (by 40%), while revenues decreased by 28.5%, which indicates a more effective optimization of production costs. In addition, gross margin ratio in 2021 is higher than that of benchmark companies.

Net margin ratio remained at the previous level of 8% (if we adjust for "other income"). The stable level of Net margin shows that the company manages to maintain profitability even in the conditions of sanctions. But, at the same time, the Net Margin level is almost twice lower than that of its competitors. In general, we can observe that in 2018 the Net Margin level exceeded the level of benchmarks, but then, due to the sanctions pressure, it could not increase in the same way as it increased for peer companies.

Return on assets as well as return on equity declined when adjusted for other income. In both cases, the indicator has been decreasing year by year since 2018. While the average values of the peer companies had a reverse trend. Moreover, the ROA and ROE values are almost similar to those of ZTE.

The company increased the amount of money in its deposit accounts by 161% to $222,5 million. In addition, there was an increase in investment fund in structured deposits, bond funds, money market funds and variable net worth wealth management products. Also, in our case, the decrease in ROA and ROE may be due not only to a decrease in the company's profits, but also to an increase in investment in R&D. As shown above, R&D investment has increased since 2018 in absolute and relative terms even as total profits have declined. Huawei's R&D to revenue ratio is higher than that of its peers. We can only expect that investment in R&D can, in the future, increase profits, which will lead to an increase in ratios.

The company's debt ratio is at the level of benchmark companies and has even been declining since 2018. In 2022, however, the company issued two tranches of 3-year medium-term notes with a combined principal amount of $1,250 million and one tranche of 5-year medium-term notes with a principal amount of $469 million, according to the 2021 report. In March 2022, the Company issued super short-term commercial paper with a principal amount of approximately half a billion dollars. It is worth expecting that such a move will increase the company's total debt in 2022 to $2,65 billion from $1,7 billion last year and $1,4 billion in 2020. However, such a step was necessary to maintain the business and its further development. This includes supporting investment in R&D.

The decrease in the inventory turnover ratio by more than half compared to 2018 and almost 1.5 times compared to 2020 indicates a significant increase in inventory holding time. This could indicate low sales, high inventory levels, or poor management. Unsold inventory can be at

significant risk from market price fluctuations and obsolescence. But much of this can be attributed to the COVID-19 pandemic, when many supply chains were suspended, and to logistical problems associated with the Evergreen ship stuck in the Suez Canal.

The increase in Current Ratio indicates an increase in the stability of the company, which is a very good indicator. In our case current assets almost twice as large as current liabilities.

3.2 Huawei performance review: Relative Valuation Model

As mentioned in the first chapter, to estimate the company's performance in terms of key segments, it is necessary to find Enterprise Value for each of the key segments. The key business segments of the company are the Carrier and Consumer segments, which generate up to 80% of the company's total profits year after year. In order to understand how much a particular segment has suffered from the impact of sanctions, it is necessary to make assumptions about the correlation between the amount of assets and liabilities on the balance sheet, as well as production costs and net profit by business segment, and the ratio of revenue of a particular segment to total revenue.

The table below shows the results of Huawei's EBITDA calculations (including all segments) using formula 1.14 presented in chapter one.

Table 4 – Huawei EBITDA calculation results, thousands USD

	2018	2019	2020	2021	2021 (Adjusted)
Net profit	8 991 667	9 080 580	9 369 420	17 768 438	8 268 906
Finance income/expences	38 333	25 797	53 188	71 449	71 449
Income Tax	(2 166 818)	(2 227 101)	(1 109 420)	(1 285 469)	(1 285 469)
EBIT	11 120 152	11 281 884	10 425 652	18 982 457	9 482 926
Depreciation and Amortization	1 765 455	2 555 797	3 267 681	4 226 094	4 226 094
EBITDA	12 885 606	13 837 681	13 693 333	23 208 551	13 709 019

According to the results of the calculation, we can see that in 2021 the net profit value has almost doubled, from $9 to $17,8 billion. However, this cannot indicate an improvement in the financial situation of the company, despite the sanctions. As was described in paragraph 1 of Chapter 3. This figure can rightly be considered an outlier, since this increase in net income is directly related to the sale of two branches. Therefore, these values will be further adjusted at the segment level by the amount of funds received from the sale of assets.

In 2021, the company received $9,5 billion in proceeds from the sale of 100% equity in the two subsidiaries. Accordingly, to get rid of the outlier, $9,5 billion will be subtracted from the net

income of $17,8 billion received in 2021. Thus, the final amount of net income after adjustment will be about $8,3 billion.

The following tables show the calculation of revenue, net profit and EBITDA of each segment. As well as the balance sheet asset and liability calculations based on the mentioned net income assumptions and the segment revenue to net income ratio and segment EBITDA.

Table 5 – Huawei selected financial indicators, thousands USD

	2018	2019	2020	2021
Cash	27 894 848	24 736 812	25 057 681	20 061 719
Debt	15 380 152	19 081 014	20 526 667	27 337 813
Equity	44 778 333	33 777 536	47 885 217	64 789 375

Table 6 – Huawei Consumer segment selected financial indicators, thousands USD

Consumer segment	2018	2019	2020	2021
Segment Revenue	52 856 364	67 725 217	69 987 826	38 036 094
% of Total Revenue	*48%*	*54%*	*54%*	*38%*
Net profit (as% of Total Net profit)	4 349 351	4 940 880	5 076 066	3 160 939
EBITDA (as% of Total EBITDA)	6 269 970	7 557 364	7 476 262	5 240 521
Cash (as% of Total Cash)	13 492 993	13 459 673	13 575 488	7 668 955
Debt (as% of Total Debt)	7 439 520	10 382 268	11 120 722	10 450 374
Equity (as% of Total Equity)	21 659 689	18 378 867	25 942 751	24 766 911

Table 7 – Huawei Carrier segments selected financial indicators, thousands USD

Carrier Segment	2018	2019	2020	2021
Segment Revenue	43 307 576	42 998 406	43 858 116	43 979 531
% of Revenue	*40%*	*35%*	*34%*	*44%*
Net profit (as% of Total Net profit)	3 563 618	3 136 941	3 180 935	3 654 861
EBITDA (as% of Total EBITDA)	5 137 266	4 798 133	4 685 026	6 059 393
Cash (as% of Total Cash)	11 055 411	8 545 480	8 507 127	8 867 289
Debt (as% of Total Debt)	6 095 530	6 591 651	6 968 839	12 083 326
Equity (as% of Total Equity)	17 746 749	11 668 652	16 257 115	28 636 935

In order to assess the dynamics of the market value of competitor companies and on this basis to calculate the dynamics of Huawei's market value, it is necessary, based on market data and data from company reports, to find the P/E, P/S, P/BV and EV/EBITDA ratios using the formulas presented in chapter one (1.9, 1.11, 1.12, 1.14).

To assess the financial performance of Huawei's consumer electronics segment, we selected companies that hold leading positions in the global smartphone market - Samsung,

Xiaomi, and Apple. Together they occupy 53% of the global market of smartphone manufacturers. Oppo and vivo, which are owned by Chinese concern BBK Electronics, occupy 17% of the market, but their reporting is not public, so their data cannot be used for analysis. 30% of the market is occupied by other manufacturers, the share of each of which does not exceed 1%, so the companies were excluded from the analysis.

In addition, adjustments were made for the fact that Samsung is a company that operates in different business segments, so revenue, EBIT and EBITDA were used to calculate according to the performance of the Samsung Mobile segment. Other data required for the calculation was calculated based on Samsung Mobile's revenue share of total revenue. For the other companies, the ratios were calculated without adjustments. The table with the calculations for each of the companies is shown in Table 1 and Table 2 of Appendix 1. Below is a table with the results of the calculations.

Table 8 – Market P/E ratio calculation results

Company name	2018	2019	2020	2021
Samsung (mobile segment)	25,88	63,79	45,78	81,70
Xiaomi	19,08	22,69	36,47	20,09
Apple	12,54	23,35	39,37	30,53
Average	*19,17*	*36,61*	*40,54*	*44,10*

The values of P/E calculations presented in Table 8 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formulas 1.8 and 1.9.

The trend for an increase in the average competitor P/E ratio in 2021 compared to 2020 was due to the growth of this indicator at Samsung (mobile segment). This was due to an increase (almost twofold) in dividend payments. Due to which the EPS decreased to the value below one, but above zero.

Table 9 – Market P/S ratio calculation results

Company name	2018	2019	2020	2021
Samsung (mobile segment)	0,98	1,49	2,09	1,82
Xiaomi	1,47	1,11	3,01	1,18
Apple	2,81	4,96	8,23	7,90
Average	1,75	2,52	4,45	3,63

The values of P/S calculations presented in Table 9 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formula 1.12.

The overall decrease in P/S ratios was due to an overall increase in company revenues. This trend is characteristic of the entire smartphone market, whose total revenue increased by 7% compared to 2020 and reached the mark of 448 billion dollars. This happened both because of the average increase in the cost of smartphones by 12%, and because of the increase in demand for mid-range and premium smartphones due to the pandemic of education, work and entertainment at home, (Counterpoint 2022).

Table 10 – Market P/BV ratio calculation results

Company name	2018	2019	2020	2021
Samsung (mobile segment)	0,96	1,31	1,80	1,67
Xiaomi	3,61	2,80	5,97	28,18
Apple	6,96	14,26	34,59	45,81
Average	3,85	6,12	14,12	25,22

The values of P/BV calculations presented in Table 10 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formula 1.15.

The increase in the P/BV ratio is a natural phenomenon. Tech companies are valued much higher than the book value of equity, and with the advent of Covid-19, investors invested more and more in tech stocks, as they hoped for growth in companies related to the growth of the entire consumer electronics market.

Table 11 – Market EV/EBITDA ratio calculation results

Company name	2018	2019	2020	2021
Samsung (mobile segment)	10,80	15,92	17,43	14,79
Xiaomi	20,13	24,11	31,42	21,10
Apple	11,53	18,69	31,42	25,90
Average	*14,49*	*19,57*	*29,70*	*20,60*

The values of EV/EBITDA calculations presented in Table 11 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formula 1.13, 1.14.

The decrease in EV/EBITDA in 2021, compared to 2020, is due to the fact that the growth of EBITDA exceeded the growth of companies' capitalization.

According to the methodology, to calculate Huawei's market value of equity, we need to use weighted average multipliers by multiplying net income, total revenue, book equity and EBITDA by P/E, P/S, P/BV and EV/EBITDA respectively. The values of net income, total revenue, book equity and EBITDA of Huawei Consumer segment are presented in Table 6. In the

case of EV/EBITDA multiplier, we get the enterprise value of the company. In the case of P/E, P/S, P/BV - market capitalization.

The results of market capitalization presented in Table 12, are calculated on the basis of the average values obtained in Tables 8,9,10 and multiplied by the relevant financial indicators presented in Table 6 on the basis of formulas 1.10, 1.12, 1.15

Table – 12 Huawei Consumer segment's Market capitalization calculation results according to Relative ratios

Market Capitalization acc. to	2018	2019	2020	2021
P/E	83 361 038	180 892 442	205 791 493	299 565 928
P/S	92 656 354	170 682 136	311 215 922	138 240 667
P/BV	83 293 603	112 517 478	366 311 301	624 641 520

Market capitalization does not properly reflect the value of the firm because it does not take into account the company's debt and cash reserves. Therefore, the resulting value of market capitalization must be adjusted by the amount of net debt according to formula 1.13.

Table 13 – Huawei Consumer segment's EV Calculation results according to Relative ratios

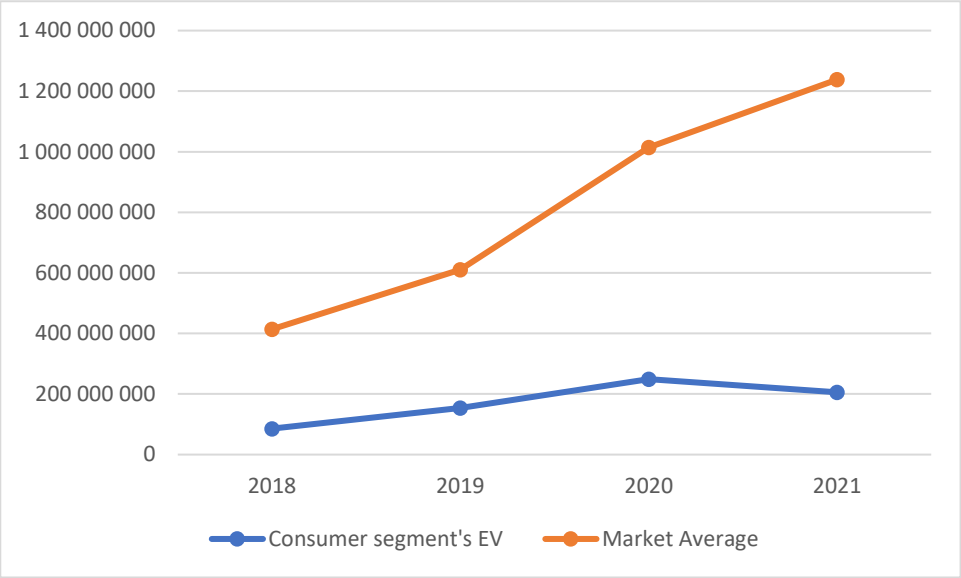
EV acc. to	2018	2019	2020	2021
P/E	77 307 565	177 815 038	203 336 728	302 347 346
P/S	86 602 881	167 604 731	308 761 157	141 022 086
P/B	77 240 130	109 440 074	363 856 535	627 422 938
EV/EBITDA	90 320 759	147 363 470	220 308 096	107 938 227

EV value according to EV/EBITDA ratio is calculated based on the data of average values of this ratio in Table 11 multiplied by EBITDA value in Table 6.

Then, based on the weights described in the methodology, we must calculate the weighted average enterprise value of Huawei and compare it to the average enterprise value of competitor companies. To get the Consumer segment's EV we need to multiply the EV value according to each ratio of each year by the weight. The weights are shown in Table 1.

Table 14 – Huawei Consumer segment's EV comparing with average peer-companies' EV

	2018	2019	2020	2021
Consumer segment's EV	85 666 481	153 709 696	248 959 279	205 385 294
Market Average	413 793 809	610 031 878	1 014 338 605	1 238 108 294



Graph 14 – Huawei consumer segment and peer-companies' EV comparison

Based on the chart below, which results from Huawei's previous calculations of enterprise value (EV) based on relative ratios, we can conclude that the sanctions have had a significant impact on the dynamics of the company's consumer segment. As mentioned in the previous chapter, the sanctions on Huawei came into force in 2020, so 2021 should be considered a full-fledged subsanction year. Instead of a continuation of the trend towards an increase in the value of the consumer electronics segment, there is a breakdown. The calculated EV decreased by almost 30%, while the EV of benchmark companies increased by 22%. Since there are no prerequisites for easing the sanctions pressure, it should be assumed that the negative dynamics will continue. This is confirmed by the fact that Huawei, as described above, sold one of its key assets in the consumer electronics segment - the HONOR brand. The company preferred to get the money now and get rid of some liabilities, because in the future it did not expect to get an acceptable level of income from the asset, that have been sold.

However, the company does not intend to leave the consumer electronics market completely. The company's share of the personal computer market, although declining, is still significant. Huawei accounts for up to 6.6% of all personal computers sold in the world, (Canalys 2021). Moreover, as shown above, the share of R&D expenditures is growing despite the overall drop in revenues. Some of the developments are aimed directly at the smartphone market. For example, the company has already developed and plans to release its operating system to the global market, which could become a replacement not only for Android OS, but also for Windows OS. In addition, the company's management is working on getting an ARM license to produce its own processors. Arm Holdings says its latest chip architecture, Armv9, is not subject to US Export Administration Regulations, (Asia Times 2021).

The Carrier segment should be analyzed in a similar way. For this purpose, we selected companies that are among the leaders in the market of telecommunications equipment: Nokia, Ericsson, Cisco. These three companies together occupy up to 40% of the market. The company ZTE, which has a global market share of close to 10%, was excluded from the sample, as this company, along with Huawei, was subject to similar sanctions from the U.S. Consequently, the use of this company's data in the context of comparing the average market performance with the sub-sanction performance is irrational.

Table 15 – Market P/E ratio calculation results

Company name	2018	2019	2020	2021
Nokia	-23,47	-37,24	-8,65	21,90
Ericsson	-21,00	-97,31	33,38	21,32
Cisco	48,84	18,46	17,82	26,79
Average	*1,5*	*-38,7*	*14,2*	*23,3*

The values of P/E calculations presented in Table 15 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formulas 1.8 and 1.9.

Based on the P/E Ratio calculations in the table above, we can see that Nokia was negative from 2018 to 2020 and Ericsson was negative from 2018 to 2019. This was due to negative EPS caused by negative net income. To get rid of the negative valuation of Huawei due to the negative average value, we need to equate the weight of this indicator to zero, and the weight that this indicator should have had to divide equally among the three remaining ratios.

Table 16 – Market P/S ratio calculation results

Company name	2018	2019	2020	2021
Nokia	1,25	0,75	0,87	1,43
Ericsson	1,14	1,17	1,56	1,32
Cisco	3,95	3,92	3,84	5,36
Average	2,11	1,94	2,09	2,70

The values of P/S calculations presented in Table 10 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formula 1.12.

The decrease in P/S ratios is due to a significant increase in the market capitalization of the companies, caused by investors' expectations of profits from the deployment of 5G networks.

A similar way to describe the increase in the P/BV ratio (the table below). An increase in market capitalization while keeping the book value of equity at approximately the same level as in the past time intervals.

Table 17 – Market P/BV ratio calculation results

Company name	2018	2019	2020	2021
Nokia	1,83	1,20	1,52	1,73
Ericsson	2,74	3,24	4,25	2,86
Cisco	4,51	6,06	4,99	6,48
Average	3,03	3,50	3,59	3,69

The values of P/BV calculations presented in Table 17 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formula 1.15.

Table 18 – Market EV/EBITDA ratio calculation results

Company name	2018	2019	2020	2021
Nokia	28,91	17,67	14,62	15,00
Ericsson	57,94	22,31	13,89	11,52
Cisco	19,92	17,93	18,02	24,33
Average	*35,6*	*19,3*	*15,5*	*17,0*

The values of EV/EBITDA calculations presented in Table 18 are calculated based on the data contained in Tables 1 and 2 of Appendix 1 and using formula 1.13, 1.14.

The growth of EV/EBITDA after 2020 characterizes the favorable situation in the telecommunications equipment market. The most important factor in the development of this sector is the continuing trend towards 5G network deployment, which, although it slowed down in 2020, still persists. The share of global use of 5G networks will increase from 8% to 25% by 2025, (GSMA 2022).

In addition, there is growth in the mobile economy as a whole. According to the GSMA study, the number of mobile Internet users will increase by 0.8 billion users and reach the value of 5 billion by 2025.

All these factors indicate a favorable environment for the development of companies in the market of telecommunications equipment, despite the significant decline in 2019 and 2020.

The results of market capitalization presented in Table 12, are calculated on the basis of the average values obtained in Tables 8,9,10 and multiplied by the relevant financial indicators presented in Table 6 on the basis of formulas 1.10, 1.12, 1.15

Table – 19 Huawei Carrier segment's Market capitalization calculation results according to Relative ratios

Market capitalization acc. to	2018	2019	2020	2021
P/S	91 482 902	83 608 278	91 620 137	118 940 489
P/BV	53 719 235	40 843 143	58 304 147	105 588 789

The results obtained in Table 20 are calculated in the same way as in Table 13.

As mentioned above, the P/E value was excluded from the calculations due to its negative values, and the weight was redistributed evenly among the other ratios

Table 20 – Huawei Carrier segment's EV Calculation results according to Relative ratios

EV acc. to	2018	2019	2020	2021
P/S	86 523 022	81 654 449	90 081 850	122 156 526
P/BV	48 759 355	38 889 314	56 765 860	108 804 826
EV/EBITDA	181 752 270	92 269 758	72 114 139	102 723 220

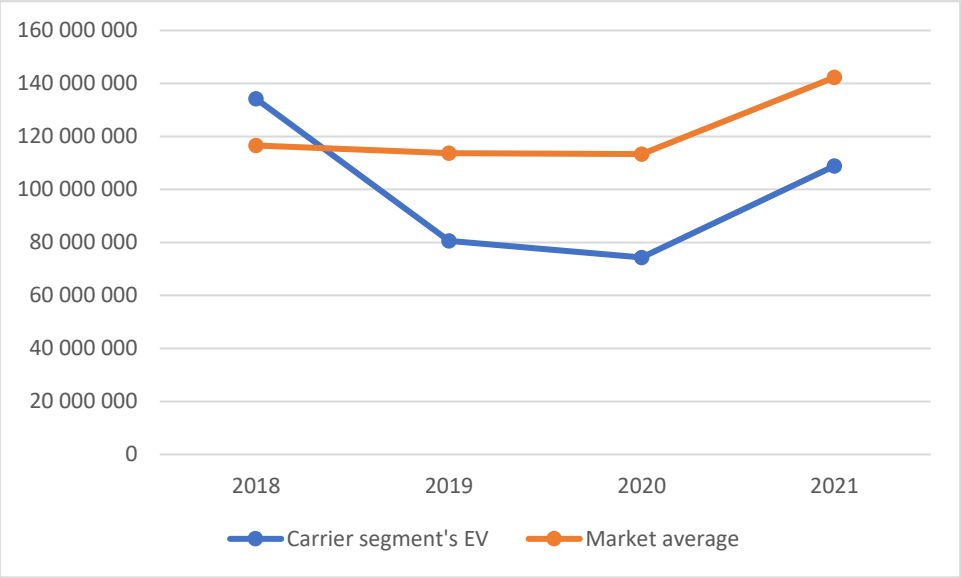
Table 21 – Relative Ratios weight (adjusted in Carrier segment case)

Relative Ratio	Weight
EV according to P/E ratio	0
EV according to P/S ratio	0,2666
EV according to P/BV ratio	0,1666
EV according to EV/EBITDA	0,5666

As it was mentioned above, due to negative P/E values, the weight of this ratio was equated to zero, and its weight was evenly distributed among other ratios. To get the Consumer segment's EV we need to multiply the EV value according to each ratio of each year by the weight in table 21.

Table 22 – Huawei Consumer segment's EV comparing with average peer-companies' EV

	2018	2019	2020	2021
Carrier segment's EV	134 192 318	80 542 268	74 347 482	108 919 036
Market average	116 646 213	113 719 363	113 358 480	142 298 908



Graph 15 – Huawei carrier segment and peer-companies' EV comparison

The graph shows the comparison of Huawei Carrier segment's enterprise value calculated using relative ratios. The dynamics of the average EV of peer companies is also presented. Based on the graph, we can see that Huawei expectedly outperformed its competitors until 2019. Then, largely due to sanctions, the company's EV indicator declined. However, the company managed to maintain the dynamic of the company's value growth relative to the market in 2021.

This is a testament to the high level of management at Carrier segment. This allowed the company to turn a negative trend into a positive one, maintaining the average market dynamics. This means that the impact of sanctions on this segment of the company was insignificant.

This is largely due to the fact that there is a steady trend for the development of 5G networks. The global 5G services market is expected to grow from $40 billion in 2021 to $95 billion in 2022 at a compound annual growth rate (CAGR) of 137.5% Moreover, the company signed more than 3,000 commercial contracts for industrial 5G applications in 2021, (Huawei Investment & Holding Co. Ltd. 2022). Thus, we should expect the EV growth trend in the telecommunications equipment segment to continue. This segment is capable not only of returning to pre-sanctioned values, but also of outperforming its competitors.

CONCLUSION

The main purpose of this thesis is to estimate the impact of sanctions on the financial performance of Huawei. This objective is based on the hypothesis that the impact of sanctions on the company's activities was insignificant based on the continuing increase in the company's net profit.

The study was primarily driven by the following factors:

1. Acceleration of tendencies of de-globalization and, as a consequence, strengthening of trade confrontation between countries
2. Increased sanctions pressure not only on companies from China but also on a number of Russian companies. The need to adopt the successful experience of doing business under sanctions pressure.
3. The need to make an objective estimation of the company's financial performance under the sanctions.

The thesis estimated the impact of sanctions on the company as a whole, as well as on its main divisions. Based on the results of the work, we can conclude that the impact of the sanctions was quite ambiguous.

Huawei's financial results were significantly better than those of ZTE, which was under similar sanctions pressure. This means that, all other things being equal, the company's management managed to maintain the stability of a number of business processes. The company manages to keep its margins at the level of peer companies due to a successful policy of cost reduction.

Compared to other similar companies, we can observe a significant decrease in the key profitability indicators - ROE and ROA (more than twice), which is caused by a high level of investment in R&D. However, the gross and net margins have not only recovered to pre-crisis levels, but also surpassed them. However, the company is experiencing a prolonged negative trend related to sales of finished products. This is evidence of the breakdown of previous supply chains, related both to the Covid-19 pandemic and directly to the sanctions.

The relative ratios method was used to estimate the impact of sanctions on the key segments of the company. Based on this method, the dynamics of Enterprise value of two key segments of the company was calculated compared with the average value of peer companies. On the basis of the data obtained, the conclusion was made that the most affected segment was the Consumer segment.

Enterprise value of Consumer segment not only decreased significantly, but also had the opposite trend from the market. Despite the fact that the company is taking steps to restore the business: for example, by increasing investment in the development of its own software or

concluding agreements with licensors of processor architecture, there are no grounds to expect the recovery of Enterprise value at least to pre-crisis values.

To reduce the effect of sanctions, the company's management has taken several steps, the most important of which were: the issue of bonds worth $470 million and it will increase the company's total debt in 2022 to 17 billion yuan ($2,6 billion) from 11 billion yuan ($1,7 billion) last year and 9 billion yuan ($1,4 billion) in 2020. Also company sold one of the key branches of the consumer electronics segment - the Honor brand, to increase its cash. Now Honor separately generates about $20 billion annually. That is more than half of the consumer electronics segment's 2021 revenue. The first and second steps, while having short-term positive effects, will have significant long-term consequences that will lead to both increased leverage and reduced revenues.

The segment of telecommunications equipment, although, formally, was a direct target of sanctions, but did not suffer significantly. The estimated value of this segment maintained market dynamics and even surpassed it in 2021. Assumed EV increased by 46% compared to 2020. Moreover, the company is still the world leader in the telecommunications equipment market.

To summarize, it can be said that, at first glance, the impact of sanctions on the financial performance of the company was not significant. However, despite the steps that made it possible to maintain the short-term sustainability of the financial results, there are reasons to believe that the long-term effect of the sanctions will be much more significant. If the sanctions pressure continues, that the company's Consumer segment will generate less and less profit. The decline in profits will not be able to be offset by the growth in profits of the Carrier segment. Which could lead to a reduction in R&D expenditures and, as a consequence, a decrease in the company's share of the telecommunications equipment market. The Consumer segment has a higher margin than the Carrier segment and requires significantly less investment in R&D. Therefore, a decline in revenue from the Consumer segment could be a serious problem in the future.

From a practical point of view this thesis can be used in several cases. First, the analysis of the impact of sanctions on Huawei can be used to make decisions on the purchase of the company's corporate bonds. Secondly, Huawei's competitors can use the thesis to assess the company's development prospects under sanctions pressure. Thirdly, such an analysis can be used as an example of a successful case study of overcoming sanctions for Russian companies (especially in the IT sphere).

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APPENDIX 1

Table 1 – Smartphone shipment leaders company's Relative ratios calculation, thousands USD

USD '000	Samsung				Xiaomi				Apple			
	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
All Business segments												
Market cap.	204 860 000	294 530 000	433 460 000	445 640 000	38 970 000	33 190 000	107 370 000	60 520 000	746 080 000	1 290 000 000	2 260 000 000	2 890 000 000
Shares outstanding (common)	5 969 782	5 969 782	5 969 782	5 969 782	20 350 000	20 350 000	20 350 000	20 350 000	20 000 000	18 596 000	17 528 000	16 865 000
Dividends	8 271 929	8 746 762	8 459 293	17 929 150	0	1 489	0	0	13 735	14 129	14 087	14 431
Cash & Cash equivalents	26 033 073	23 069 002	25 681 845	34115412	4 580 325	3 756 502	7 935 137	3 673 684	66 301 000	100 557 000	90 943 000	62 639 000
Total Assets	291 178 800	302 511 023	330 596 969	372 888 268	22 004 235	26 612 929	36 765 192	45 764 355	365 725 000	338 516 000	323 888 000	351 002 000
Total Debt	78 599 066	76 951 655	89 404 577	106 390 451	11 208 761	14 778 483	18 792 219	24 290 527	258 578 000	248 028 000	258 549 000	287 912 000
Total Equity	212 579 734	225 559 368	241 192 392	266 497 817	10 795 474	11 834 446	17 972 973	2 147 421	107 147 000	90 488 000	65 339 000	63 090 000
EV	257 425 993	348 412 653	497 182 732	517 915 039	45 598 435	44 211 981	118 227 082	81 136 843	938 357 000	1 437 471 000	2 427 606 000	3 115 273 000
EPS	4,988	1,659	2,449	2,840	0,100	0,072	0,145	0,148	2,976	2,971	3,275	5,61
Revenue	209 163 262	197 690 938	206 981 172	244 388 604	26 502 337	29831693,04	35 632 696	51 298 297	265 595 000	260 174 000	274 515 000	365 817 000
Net profit	38 049 231	18 652 605	23 081 768	34 881 111	2 042 083	1464195,652	2 943 870	3 013 000	59 531 000	55 256 000	57 411 000	94 680 000
Finance income/expences	1 193 026	1 618 898	829 949	733 008	32 784	58323,04348	348 014	251 813	2 446 000	1 385 000	890 000	198 000
Income Tax	14 427 866	7 459 135	8 685 685	11 751 059	68 087	298506,6667	191 406	802 156	13 372 000	10 481 000	9 680 000	14 527 000
Profit before tax	52 477 097	26 111 740	31 767 453	46 632 170	2 110 170	1762702,319	3 135 275	3 815 156	72 903 000	65 737 000	67 091 000	109 207 000
Tax rate	27%	29%	27%	25%	3%	17%	6%	21%	18%	16%	14%	13%
EBIT	51 284 071	24 492 842	30 937 504	45 899 162	2 077 387	1 704 379	2 787 261	3 563 344	70 457 000	64 352 000	66 201 000	109 009 000
D&A	1 315 723	1 751 341	1 768 418	1 810 422	80 105	129 750	151 144	281 924	10 903 000	12 547 000	11 056 000	11 284 000
EBITDA	52 599 794	26 244 183	32 705 922	47 709 584	2 157 492	1 834 129	2 938 405	3 845 268	81 360 000	76 899 000	77 257 000	120 293 000
EV/Sales	1,23	1,76	2,40	2,12	1,72	1,48	3,32	1,58	3,53	5,53	8,84	8,52
EV/EBIT	5,02	14,23	16,07	11,28	21,95	25,94	42,42	22,77	13,32	22,34	36,67	28,58
EV/EBITDA	**4,89**	**13,28**	**15,20**	**10,86**	**21,13**	**24,11**	**40,24**	**21,10**	**11,53**	**18,69**	**31,42**	**25,90**
P/E	**6,88**	**9,89**	**29,64**	**26,29**	**19,08**	**22,69**	**36,47**	**20,09**	**12,54**	**23,35**	**39,37**	**30,53**
P/S	**0,98**	**1,49**	**2,09**	**1,82**	**1,47**	**1,11**	**3,01**	**1,18**	**2,81**	**4,96**	**8,23**	**7,90**
P/BV	**0,96**	**1,31**	**1,80**	**1,67**	**3,61**	**2,80**	**5,97**	**28,18**	**6,96**	**14,26**	**34,59**	**45,81**

Table 2 – Samsung mobile segment Relative ratios calculations

Mobile Business segment	2018	2019	2020	2021
Revenue	91 500 206	92 051 181	84 438 836	95 410 630
% of Total Revenue	*44%*	*47%*	*41%*	*39%*
D&A	1 177 869	2 234 543	1 907 717	1 750 054
Operating profit (EBIT)	9 244 756	7 957 232	9 727 517	11 918 602
EBITDA	10 422 625	10 191 775	11 635 234	13 668 656
Finance income/expences (as %)	521 899	753 810	338 581	286 170
Profit before tax	9 766 655	8 711 042	10 066 098	12 204 772
Income Tax	2 685 209	2 488 415	2 752 218	3 075 538
Net profit	7 081 446	6 222 627	7 313 880	9 129 234
EV (as %)	112 613 139	162 232 000	202 827 779	202 196 827
Dividends (as %)	3 618 624	4 072 770	3 451 004	6 999 637
Shares outstanding (as %)	2 611 531	2 779 720	2 435 398	2 330 635
Total debt (as %)	34 383 814	35 831 135	36 472 972	41 535 406
Cash (as %)	11 388 384	10 741 660	10 477 016	13 318 841
Market Cap.	89 617 709	137 142 525	176 831 823	173 980 262
EPS, usd	1,3260	0,7734	1,5861	0,9137
Market value per share	34,3162	49,3368	72,6090	74,6493
EV/Sales	1,23	1,76	2,40	2,12
EV/EBIT	12,18	20,39	20,85	16,96
EV/EBITDA	**10,80**	**15,92**	**17,43**	**14,79**
P/E	**25,88**	**63,79**	**45,78**	**81,70**
P/BV	**0,96**	**1,31**	**1,80**	**1,67**
P/S	**0,98**	**1,49**	**2,09**	**1,82**

APPENDIX 2

Table 1 – Smartphone shipment leaders company's Relative ratios calculation, thousands USD

in thousands	Nokia				Ericsson				Cisco			
All Business segments	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
Market cap. (thousand usd)	33 190 000	20 690 000	21 760 000	35 550 000	28 880 000	29 190 000	39 830 000	36 770 000	194 810 000	203 450 000	189 090 000	267 260 000
Shares outstanding (common)	5 652 000	5 626 000	5 612 000	5 684 000	3 286 000	3 300 000	3 317 000	3 328 000	4 924 000	4 505 000	4 260 000	4 234 000
Dividends	1 073 880	562 600	0	0	591 480	544 500	729 740	998 400	610 576	597 900	601 600	616 300
Cash & Cash equivalents	8 396 880	6 911 520	9 433 500	11 332 720	5 401 680	5 702 180	5 547 520	8 037 840	8 934 000	11 750 000	11 809	9 175
Total Assets	46 630 060	43 823 360	41 257 740	47 257 820	32 251 320	30 402 130	29 868 300	36 673 680	108 784 000	97 793 000	94 853 000	97 497
Total Debt	28 492 280	26 574 240	26 956 440	26 652 660	21 718 920	21 395 550	20 498 830	23 821 800	65 580 000	64 222 000	56 933 000	56 222 000
Total Equity	18 137 780	17 249 120	14 301 300	20 605 160	10 532 400	9 006 580	9 369 470	12 851 880	43 204 000	33 571 000	37 920 000	41 275 000
EV	53 285 400	40 352 720	39 282 940	50 869 940	45 197 240	44 883 370	54 781 310	52 553 960	251 456 000	255 922 000	246 011 191	323 472 825
EPS	-0,25	-0,10	-0,45	0,29	-0,42	-0,09	0,36	0,52	0,81	2,45	2,49	2,36
Revenue	26 624 340	27 744 850	24 911 280	24 866 240	25 300 560	24 993 760	25 562 900	27 877 680	49 330 000	51 904 000	49 301 000	49 818 000
Net profit	-340 000	7 000	-2 516 000	1 623 000	-783 600	244 530	1 923 130	2 723 280	110 000	11 621 000	11 214 000	10 591 000
Finance income/expences	-243 080	-263 200	-200 640	-154 580	-119 640	-60 280	-87 780	-70 920	637 000	449 000	335 000	184 000
Income Tax	223 020	154 560	3 711 840	320 960	577 560	761 420	1 054 790	752 400	12 929 000	2 950 000	2 756 000	2 671 000
EBIT	126 100	424 760	1 396 480	2 098 540	-86 400	1 066 230	3 065 700	3 546 600	12 402 000	14 122 000	13 635 000	13 078 000
D&A	1 716 900	1 859 200	1 290 480	1 292 100	866 520	945 890	877 580	1 014 960	221 000	150 000	14 100	215 000
EBITDA	1 843 000	2 283 960	2 686 960	3 390 640	780 120	2 012 120	3 943 280	4 561 560	12 623 000	14 272 000	13 649 100	13 293 000
EV/Sales	2,00	1,45	1,58	2,05	1,79	1,80	2,14	1,89	5,10	4,93	4,99	6,49
EV/EBIT	422,56	95,00	28,13	24,24	-523,12	42,10	17,87	14,82	20,28	18,12	18,04	24,73
EV/EBITDA	**28,91**	**17,67**	**14,62**	**15,00**	**57,94**	**22,31**	**13,89**	**11,52**	**19,92**	**17,93**	**18,02**	**24,33**
P/E	**-23,47**	**-37,24**	**-8,65**	**21,90**	**-21,00**	**-97,31**	**33,38**	**21,32**	**48,84**	**18,46**	**17,82**	**26,79**
P/S	**1,25**	**0,75**	**0,87**	**1,43**	**1,14**	**1,17**	**1,56**	**1,32**	**3,95**	**3,92**	**3,84**	**5,36**
P/BV	**1,83**	**1,20**	**1,52**	**1,73**	**2,74**	**3,24**	**4,25**	**2,86**	**4,51**	**6,06**	**4,99**	**6,48**

APPENDIX 3

Table 1 – Huawei financial indicators, Million CNY

Year	Revenue	COGS	Net Profit	Current Assets	Current Liabilities	Total Assets	Cash flow from operations	R&D expenses	Debt	Inventories	Equity
2018	721 202	443 031	59 345	530 114	359 250	665 792	74 659	101 509	432 727	94 501	233 065
2019	858 833	536 144	62 656	703 893	446 255	858 661	91 384	131 659	563 124	165 361	295 573
2020	891 368	564 236	64 640	691 394	392 332	876 854	32 218	141 893	546 446	167 303	330 408
2021	636 807	329 365	113 718	769 378	392 455	982 971	59 670	142 666	568 319	161 078	414 652
2021 adjusted on other income	636 807	329 365	52 921	769 378	392 455	982 971	59 670	142 666	568 319	161 078	414 652

APPENDIX 4

Table 1 –Peer-companies accounting ratio calculating results

	Gross Margin Ratio	Net Margin	ROA	ROE	Current Rato	Debt Ratio	Inventory Turnover Ratio
Samsung							
2021	0,40	0,14	0,09	0,13	2,48	0,29	4,02
2020	0,39	0,11	0,07	0,09	2,62	0,27	4,51
2019	0,36	0,09	0,06	0,08	2,84	0,25	5,50
2018	0,46	0,18	0,13	0,18	2,53	0,27	4,57
Xiaomi							
2021	0,18	0,06	0,07	0,14	1,61	0,53	5,15
2020	0,15	0,08	0,08	0,16	1,63	0,51	5,02
2019	0,14	0,05	0,05	0,12	1,49	0,56	5,44
2018	0,13	0,08	0,09	0,19	1,71	0,51	5,18
Apple							
2021	0,42	0,26	0,27	1,50	1,07	0,82	32,37
2020	0,38	0,21	0,18	0,88	1,36	0,80	41,75
2019	0,38	0,21	0,16	0,61	1,54	0,73	39,40
2018	0,38	0,22	0,16	0,56	1,12	0,71	41,39
Nokia							
2021	0,40	0,07	0,04	0,09	1,62	0,56	5,59
2020	0,37	-0,12	-0,07	-0,20	1,55	0,65	6,09
2019	0,36	0,00	0,00	0,00	1,39	0,61	5,11
2018	0,37	-0,02	-0,01	-0,02	1,30	0,61	4,46
Ericsson							
2021	0,43	0,10	0,07	0,21	1,38	0,65	3,74
2020	0,40	0,08	0,06	0,21	1,31	0,69	4,94
2019	0,37	0,01	0,01	0,03	1,32	0,70	4,61
2018	0,32	-0,03	-0,02	-0,07	1,45	0,67	4,88
Cisco							
2021	0,64	0,21	0,11	0,26	1,49	0,58	11,50
2020	0,64	0,23	0,12	0,30	1,72	0,60	13,74
2019	0,63	0,22	0,12	0,35	1,51	0,66	13,91
2018	0,62	0,00	0,00	0,00	2,29	0,60	10,14
ZTE							
2021	0,35	0,06	0,04	0,13	1,63	0,68	2,04
2020	0,32	0,04	0,03	0,09	1,44	0,69	2,06
2019	0,37	0,06	0,04	0,14	1,19	0,73	2,06
2018	0,33	-0,08	-0,05	-0,20	1,04	0,75	2,29

Table 2 – Huawei and peer-companies accounting ratio calculating results

	Huawei Unadjusted				Huawei Adjusted				ZTE				Market Average			
	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
Gross Margin Ratio	38,6%	37,6%	36,7%	48,3%	38,6%	37,6%	36,7%	48,3%	32,9%	37,2%	31,6%	35,2%	38,1%	37,3%	39,0%	41,2%
Net Margin	8,2%	7,3%	7,3%	17,9%	8,2%	7,3%	7,3%	8,3%	-7,7%	6,1%	4,2%	5,9%	7,3%	9,8%	9,8%	14,0%
ROA	8,9%	7,3%	7,4%	11,6%	8,9%	7,3%	7,4%	5,4%	-5,1%	3,9%	2,8%	4,0%	5,9%	6,8%	7,3%	10,9%
ROE	25,5%	21,2%	19,6%	27,4%	25,5%	21,2%	19,6%	12,8%	-19,9%	14,5%	9,3%	12,8%	13,8%	19,8%	24,0%	38,9%
Current Rato	1,48	1,58	1,76	1,96	1,48	1,58	1,76	1,96	1,04	1,19	1,44	1,63	1,73	1,68	1,70	1,61
Debt Ratio	15,2%	15,3%	16,2%	17,8%	15,2%	15,3%	16,2%	17,8%	74,5%	73,1%	69,4%	68,4%	56,2%	58,5%	58,7%	57,1%
Inventory Turnover Ratio	4,69	3,24	3,37	2,04	4,69	3,24	3,37	2,04	2,29	2,06	2,06	2,04	11,77	12,33	12,68	10,40