COLEGIO UNIVERSITARIO DE ESTUDIOS FINANCIEROS

DOUBLE DEGREE IN LAW AND BUSINESS ADMINISTRATION

Final Degree Project- Business Administration

ACCOUNTING AND FINANCIAL ANALYSIS OF TWO COMPANIES IN THE SEMICONDUCTORS INDUSTRY

Autor: Barandiarán Botella, Patricia
Tutor: Lasarte López, Mariano

Madrid, January 2022

INDEX

1. INTRODUCTION

1.1. WHY THE SEMICONDUCTOR INDUSTRY?

The semiconductor industry is really important, not only because it continues to develop year after year, but it is also vital for the world economy nowadays.

We are aware about the interest this business brings; however, we do not have information about its most important players, customers, markets or products. As it is a very complicated market, and we do not understand the activity performed by the firms, this sector becomes unknown. From my viewpoint, the semiconductor industry has a great potential; so, I decided to analyze Siltronic and Infineon, two companies that operate under this industry, in order to acquire knowledge about the evolution and outlook of the semiconductors.

If we are asked to name car brand, or smartphones brand; a lot of different ideas would come to our mind. But we have no information about their suppliers, and the value that semiconductor industry is creating. I consider very interesting to analyze companies whose clients are Appe, Mercedes, HP, Hyundai, Amazon, among hundreds of important companies.

Now, my election of companies has also been affected by other factors. I wanted to analyze European companies, that reported their financial information under the IFRS standards, in order to be able to compare them; and with the aim of demonstrating and developing through their analysis, the knowledge I have acquired about the IFRS during my degree. However, after previous research of the sector, I discovered that most of the decisive players of the semiconductors industry are American or Asian companies. Siltronic and Infineon are German companies which play a very important role in the markets they operate, but are not leaders.

1.2. METHODOLOGY

We are going to be analyzing Siltronic and Infineon, as two important companies from the semiconductor sector.

First of all, we are going to introduce the industry with its more influential firms; to continue with an overview of Siltronic and Infineon. We are going to study their products, and most important segments, in order to understand the kind of markets in which these companies operate.

Once we acquire an overview of the companies and the semiconductors sector, we are going to analyze the structure of their Balance sheet statement and Profit or loss statement, computing a percentual variation of their accounts, year after year. Once we know if there have been relevant changes, we will analyze the accounts of their statements, in order to understand the performance of the companies over the period.

After this analysis of the statements, we are going to compare both companies, according to certain financial ratios which we have classified among types: liquidity, solvency, return, profitability, balance sheet structure and, market ratios.

Last, we will clarify the main conclusions obtained from the analysis.

In order to carry out this study, we are going to examine the performance of Siltronic and Infineon over the last four years: from 2017 to 2020.

2. THE SEMICONDUCTOR INDUSTRY

The semiconductor industry is very concentrated, especially in companies that operate over the equipment; and, its manufacturers.

Taiwan Semiconductors, Samsung and Intel are considered as the main manufacturers of semiconductors around the world. Between the three, they produce and distribute more than 70% of the total semiconductors produced, and almost 100% of those of higher quality. The following figure, can help us to understand the verticals of the industry:

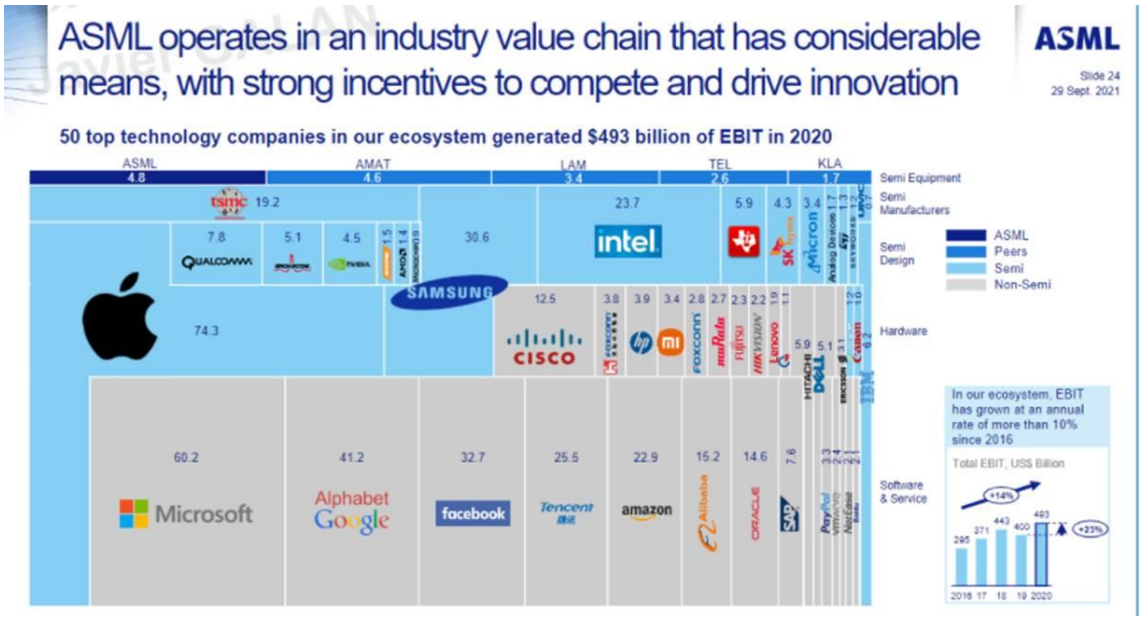

Figure 1. Source: ASML, Investor Day September, 2021

We can find in the figure above, the main semiconductor players, with its most important players. As we can observe, average EBIT has grown at an annual rate of more than 10%, since 2010.

Siltronic and Infineon are two companies that operate in the semiconductor market, but with different type of products. Siltronic manufactures wafers, that is a thin slice of semiconductor which is utilized in the production of circuits. However, Infineon produces semiconductor chips, which are ready to use, and can be applied in different sectors: security, vehicles, technology, smartphones…. We can find in the following graph, a comparison of both semiconductors and wafers performance over past years; and expected outlook of the industry.

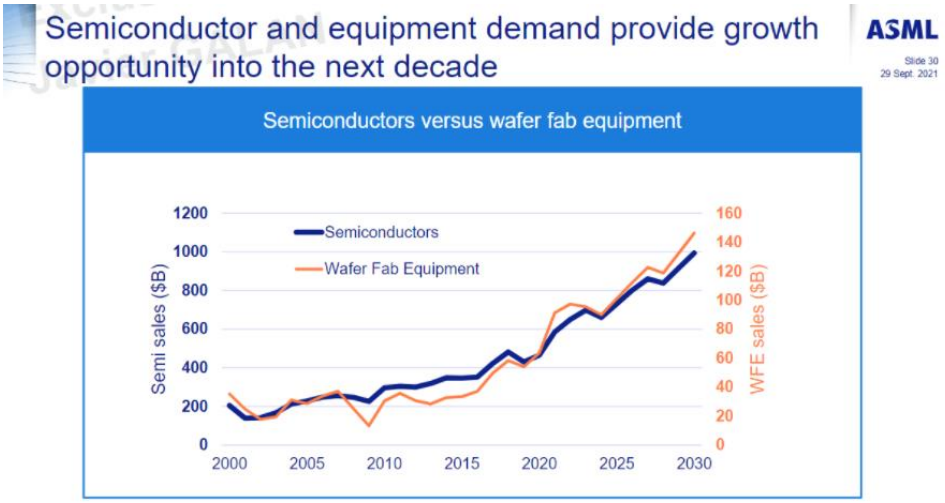

Figure 2. Source: ASML Investor Day, September, 2021

As we can observe, semiconductors and wafers present similar growth perspectives; however, semiconductor final products create more value and therefore, present higher sales. Wafers are an essential part of the semiconductor industry, but are not final product. For example, Infineon produces semiconductors which can be used by Mercedes in their cars. However, Siltronic manufactures semiconductors wafers, which are needed for the creation of a microchip, but needs further transformation; thus, the value this type of products introduce is lower.

In this industry we can find a lot of different types of companies, and the value they create will depend, among other factors on: their size and market share (since they will benefit from economies of scale, which play an essential role in the semiconductor sector); and, type of products they produce, because some are easy to replicate and as a result, the company will have more competitors and price pressure.

As we can see, it is a very complicated sector, which is very concentrated, but also, in which we can find many companies which operate under the same sector, but offering different services or products (as it is the case for Infineon and Siltronic).

3. COMPANIES OVERVIEW

3.1. SILTRONIC

Siltronic is a German firm, world leading manufacturer of silicon wafers and partners with many leading semiconductor companies. Wafers are a key component of modern microchips and nanoelectronics and the basis of semiconductor chips. Therefore, they are present in infinite everyday objects; for example, smartphones, computers, screens or navigation systems.

It is listed in the Frankfurt Stock Exchange, and its headquarters are in Munich. The firm has four production sites strategically situated: two in Germany, one in USA and another one in Singapore.

Wafer market is very concentrated, the five largest manufacturers achieve almost 90% of global demand. It is an industry with large price pressure, since volumes and inventory

levels have a great impact on the performance of wafer manufacturers. The most meaningful competitors are: Shin-Etsu Handotai and SUMCO Corporation (Japanese), SK Siltron from Korea, and GlobalWafers from Taiwan.

In the following table, we can find Siltronic's market share over the period:

	2017	2018	2019	2020
Market share	15%	15%	13%	13%

Table 1. Source: Own elaboration based on data obtained from Siltronic's Annual reports

3.2. INFINEON

Infineon Technologies AG is a German world leader in semiconductor solutions, listed in the Frankfurt Stock Exchange (IFX) and in the USA on the over-the-counter market OTCQX International Premier (IFNNY), whose headquarters are located in Neubiberg (near Munich).

This company designs, manufactures and markets semiconductors, focusing on automotive, consumer electronic, radio-frequency, mobile devices, hardware-based security and industrial. The firm develops standard components as well as customer-customized products.

Infineon produces microchips and its business line can be classified among four categories:

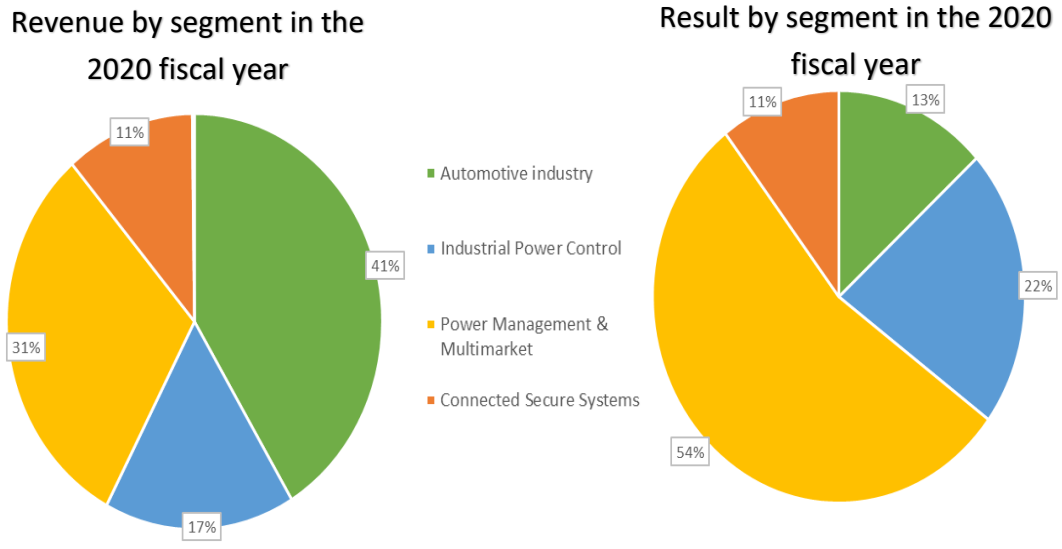

Figure3. Source: Own elaboration based on data obtained from Infineon annual report 2020

a. Microchips for the automotive

Infineon has been increasing its presence in this sector, with a market share that has grown from over a 10% in 2017 to a 20% in 2019, becoming three of the world leaders.

The car sector experienced an important decrease in 2020 due to the pandemic. However, the semiconductor presence in vehicles is growing due to the new functionalities such as electrification, driven assistance and other comfort features.

b. Microchips for the Industrial power control

This section in specialized in the electric energy among its entire conversion cycle. In this division is also the number 3 world leader, with a market share of 11.5% and revenues of 1,406 million EUR in 2020.

c. Microchips for the Power management & Multimarket

This segment is related to the smartphone industry. It is focused in the production of different electronic devices, such as power tools, lighting systems or power supplies.

Under this section, Infineon commercializes “MOSFET transistors”, which became world leaders in 2019, with 24.6% market share.

d. Microchips for the Connected secure systems

The Connected Secure Systems division creates systems for a connected and secure world, regarding the wireless connectivity solutions.

The have been developed in so as to configurate microcontrollers and combined connectivity which are used in many areas: credit and debit cards, electronic passports, consumer electronics or national ID cards.

Among this division, the company highlights its security ICs or the “industrial control system security”, where Infineon is world leader, with a market share of 26.3% in 2019. It is also remarkable the company’s presence in the Wi-Fi ICs, with a market share of 9.8%; and the security ICs for payments, with a 47.6% market share.

4. ANALYSIS OF THE BALANCE SHEET AND THE INCOME STATEMENT

In order to proceed with the comparison of the companies, we need to previously acquire deep knowledge of their financial statements. It is essential to analyze the changes from year to year, and the factors that caused them.

The analysis will rely on the information shown in the Balance Sheet and Income Statement of the companies; and an annual perceptual variation will be considered with the purpose of studying the evolution of these financial statements. Once we determine the most meaningful changes, we will carry out in-depth analysis and explain them.

The aim of these statements analysis is focused in the companies' performance evolution. For this reason, the financial statements for all the companies in absolute values are shown with the percentual variation of the accounts, from period to period: in the tables, CAGR is the variation. Thus, CAGR 2018 shows the annual percentual variation from 2017 to 2018; CAGR 2019, the percentual variation from 2018 to 2019; and CAGR 2020, from 2019 to 2020.

As a side note, it is interesting to consider that the Infineon's financial year goes from October to September (i.e., financial statements for 2020, comprehend the performance from October 2019 to September 2020). This could have an impact in the annual comparison with its competitors, taking into consideration the consequences of the pandemic. However, since we are studying the evolution of different companies in a 4-year period, the effects of this accounting difference are mitigated.

In order to compare the financials from three companies with different structures, I have created comparable Financial Statements, based on data obtained from the annual reports, and from the firm's Annual Reports. Therefore, the financial statements of both companies present a very similar structure. As a result, some financial data has been simplified, in order to permit the comparison.

The information shown in the Financial Statements is shown in Millions of Euros[1].

[1] As a side note, the information presented in this paper, separates different periods, like thousands and millions with the (,); and, separates decimals with the (.). For example, 15,002.8= Fifteen thousand and two point eight.

4.1. SILTRONIC

4.1.1. Balance Sheet

Balance Sheet (December, 31st; MEur)	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Total Current Assets	**706**	**50%**	**1,055**	**-22%**	**865**	**-5%**	**824**
Inventories	150	-1%	149	3%	153	7%	163
Receivables	160	10%	176	-19%	142	10%	156
Securities	116	247%	403	-16%	338	-53%	160
Income tax receivables	3	-33%	2	300%	8	-38%	5
Cash	226	14%	258	-22%	200	48%	295
Other current assets	51	33%	68	-65%	24	88%	45
Total non-current assets	**547**	**40%**	**763**	**29%**	**1,080**	**1%**	**1,095**
Intangible assets	24	-8%	22.2	2%	22.7	4%	23.5
PPE	513	33%	683.9	39%	951.4	1%	961.7
Right-of use assets	-	-	-	-	48.7	5%	51.2
Securities	1.3	2308%	31.3	66%	52.1	-10%	46.7
Other assets	1.5	-93%	0.1	700%	0.8	163%	2.1
TOTAL ASSETS	**1.252**	**45%**	**1.818**	**7%**	**1.945**	**-1%**	**1.919**
Total Current Liabilities	**152**	**75%**	**267**	**-10%**	**244**	**-10%**	**219**
Provisions	5	200%	15	7%	16	-56%	7
Income tax liabilities	5	460%	28	-32%	19	-11%	17
Trade liabilities	67	43%	96	32%	127	-6%	119
Customer prepayments	27	107%	56	-48%	29	-21%	23
Lease liabilities	-		-	-	4	-	4
Other financial liabilities	1	1600%	17	-76%	4	-	4
Other non-financial liabilities	47	17%	55	-18%	45	-	45
Total Long Term Liabilities	**462**	**37%**	**635**	**18%**	**771**	**7%**	**828**
Provisions	416	10%	458	24%	570	12%	640
Deferred tax liabilities	3	-33%	2	33%	3	-	3
Customer prepayments	43	307%	175	-13%	152	-10%	137
Lease liabilities	-	-	-	-	46	4%	48
Provisions	416	10%	458	24%	570	12%	640
Total Liabilities	**615**	**47%**	**903**	**11%**	**1,015**	**3%**	**1,048**
Share capital	120	-	120	-	120	-	120
Capital reserves	975	-	975	-	975	-	975
Retained earnings	-270	112%	33	230%	109	65%	180
Other equity items	-188	228%	-241	-240%	-339	-44%	-488
Minority interest	1	2800%	29	124%	65	31%	85
Total Shareholders Equity	**638**	**44%**	**916**	**2%**	**930**	**-6%**	**872**
TOTAL LIABILITIES & EQUITY	**1.252**	**45%**	**1.818**	**7%**	**1,945**	**-1%**	**1,919**

Table 2. Source: Own elaboration based on data extracted from the Siltronic's Annual report

As we can observe, Siltronic's assets increase from MEUR 1,252 in 2017 to 1,919 in 2020; that is a 53% growth in the 4 years period. Most of this increment took place in 2018, when the company grew the total value of its assets a 45%; Siltronic significantly increased both, current and non-current assets. We will analyze this increase in the following section

I have elaborated the following graphs, analyzing the evolution of their balance sheet data and its structure in current and non-current accounts.

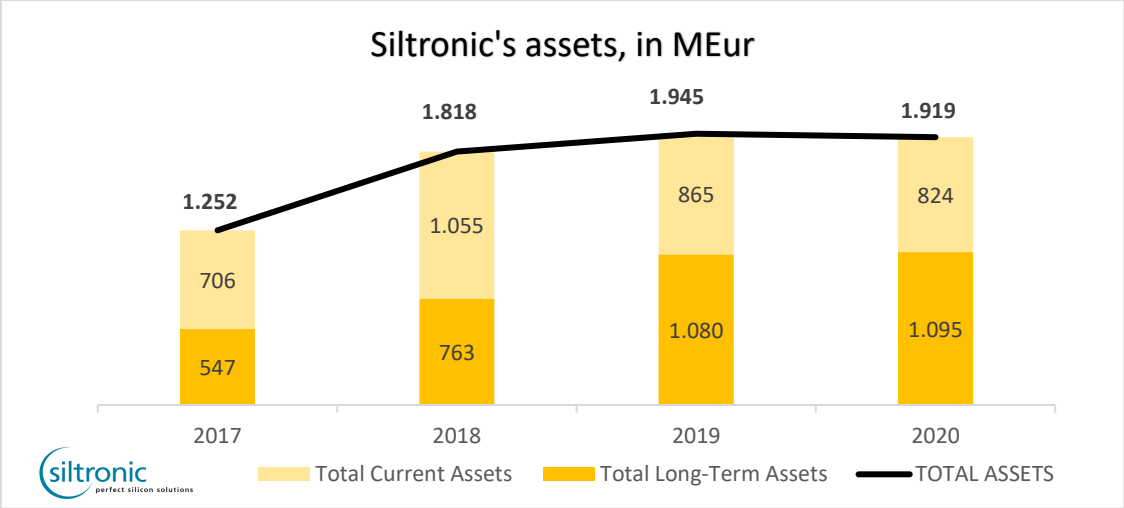

Figure 4. Source: Own elaboration based on data extracted from the Balance Sheet

The non-current assets experience a considerable growth during the time period: from 547 in 2017 to 1,095 in 2020. Most of this increase was achieved in 2018 and 2019; Siltronic's assets incremented a 39% in 2018, a 41% in 2019, and they maintained in 2020, experiencing a slight increase of over 1%.

The following graph shows the distribution of Siltronic's liabilities and equity. We can observe how the company incremented its Shareholder's Equity a 36%, from MEUR 638 in 2017, to MEUR 872 in 2020.

The company has also grown its non-current liabilities from MEUR 462 to MEUR 828; this account increased a 37% in 2018, a 21% in 2019, and 7% in 2020.

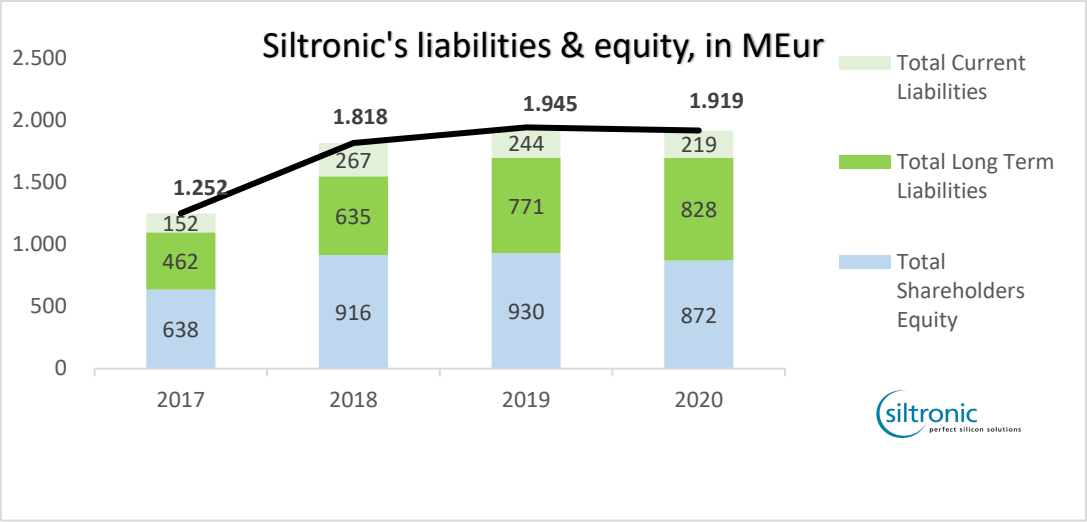

Figure 5. Source: Own elaboration based on data extracted from the Balance Sheet

In order to understand the evolution of the firm's Balance sheet statement, we are going to analyze its current and non-current assets, equity and liabilities.

4.1.1.1. Non-current Assets

To start with, we are going to study the performance of the non-current assets during the four years period. With the aim of achieving a deep understanding of the non-current assets' evolution, we are going to review the information that the firm reports, as the composition of the non-current assets account.

a. Intangible assets

Siltronic records goodwill as intangible asset from 2014, as a result of the purchase of the majority ownership of joint venture Siltronic Samsung Wafer Pte Ltd (SSW), located in Singapore[2].

In 2008, Siltronic and Samsung started a joint venture creating one of the world's largest factories for wafers[3]. In 2006, Siltronic and Samsung established SSWW as a joint venture, both companies were holding equal stake. After 18 months of construction, the facility was ready. The investment amounted over MEur 900. The production complex had a monthly capacity of 300,000 wafers, and around 650 employees.

[2] Siltronic press release, January, 2014: WACKER subsidiary Siltronic acquires majority ownership of joint venture with Samsung in Singapore – Siltronic / perfect silicon solutions
[3] Siltronic press realease, June, 2008: Siltronic and Samsung start joint venture of 300 mm wafers in Singapore – Siltronic / perfect silicon solutions

From 2014, the company owns 78% of the joint venture, decreasing Samsung's stake to 22%.

b. Property, plant and equipment (PPE)

PPE plays a very important position in the company's non-current assets. Therefore, we are going to analyze the situation of this element. As the firm shows in the Annual Reports, the main contributions to the PPE account are Land and buildings, Machinery and technical equipment, Other equipment (factory and office), and, Assets under construction (advanced payments).

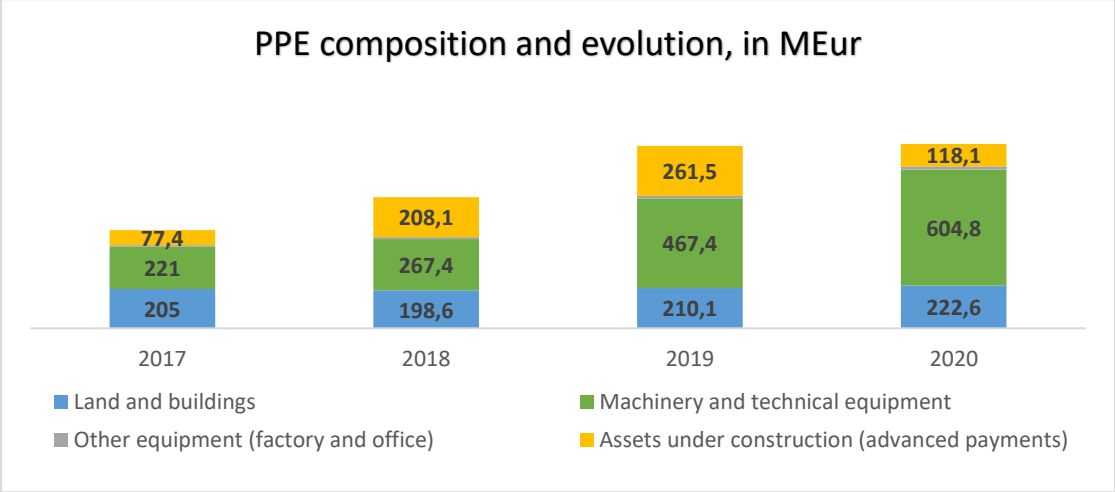

Figure 6. Source: Own elaboration based on data obtained from Siltronic's Annual reports

As we can observe in the graph above, Land and buildings remain reasonably constant during the period. The growth of the firm's non-current assets is driven by its machinery and assets under construction.

Siltronic's Machinery and technical equipment increased MEur 383, from 2017 to 2020 (170% growth); and, its Assets under construction rose MEur 41 (53%).

First, in 2018, Machinery and technical equipment account increased MEur 46 (20%) mainly due to the further automation of production. In this year, assets under construction experienced a 170% growth, MEur 130. This is related to a new hall at their existing Singapore production site[4]. The construction of this new facility started in 2018, and was fully operational in 2020; however, in 2019 part of the new hall was

[4] Press release, June, 2018: Siltronic breaks ground on a new crystal pulling hall in Singapore – Siltronic / perfect silicon solutions

ready for use. Therefore, Machinery and technical equipment experienced an increase of MEur 200 in 2019, and 137 in 2020. In addition, the assets under construction rose MEur 131 and 53 in 2018 and 2019, but decreased MEur 143 in 2020.

c. Right of use assets

This account is added in the company's Balance Sheet, in the 2019 fiscal year due to the new IFRS 16 introduction on 1 January 2019.

The IFRS 16 has an impact on the companies that report their financial statements under this accounting method. From the IFRS 16, the firm's balance sheet must recognize the leases of property and high-value equipment. Under this right of use model, the firm must include as an asset, the control over its leases for a period of time; but also, lease payments are reported as a liability.

Siltronic's leasing agreements include[5], among others, land, buildings, machinery and technical equipment and IT equipment.

d. Other non-current assets and deferred tax assets

Intangible assets remain reasonably constant during the 4 years period. Securities correspond to fixed-term deposits; which are calculated based on their remaining term.

According to the Deferred tax assets firm's allocation, the changes in this account are affected by the evolution of deferred taxes for Current assets, which increased in 2018 from MEur 2.4 to MEur 16.6; decreased to MEur 4 in 2019; and, in 2020 were MEur 9.

Deferred tax arises from temporary differences in accounting and tax rules, since accounting income is calculated before taxes. In this case, an overpayment of taxes by the company, becomes an asset because the money will eventually be returned. Since the company increased its current assets from MEur 705 to MEur 1036 in 2018, an increase of deferred tax asset of MEur 14 in this concept makes sense. In 2019,

[5] NOTE: Leasing agreements with a term of less than 12 months belong in the current assets, since they are considered short-term leases.

Siltronic's current assets decreased MEur 185, and so did the deferred tax account, which declined MEur 12.

4.1.1.2. Current Assets

To conclude with the analysis of the assets, we are going to analyze the situation of the current assets during the time period. With this purpose, we are going to focus on the cash and equivalents, accounts receivables and inventories.

Total current assets increased over a 50% from 2017 to 2018, but experienced a drop of 20% from 2018 to 2019, and continued falling, a 5% in this case, from 2019 to 2020.

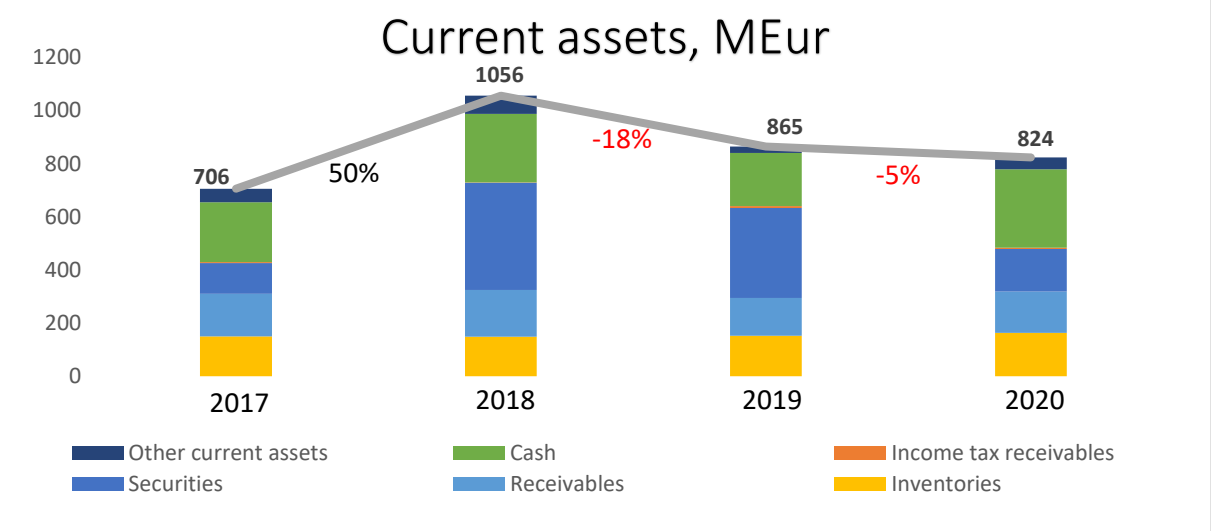

Figure 7. Source: Own elaboration based on data obtained from Siltronic's annual reports

a. Trade receivables, inventories and other current assets

As we can observe above in the Balance sheet statement and in the graph, accounts receivables, inventories and other current assets do not present great variations, and remain considerably constant during the period.

From the inventories reported by the company, the following information correspond to unfinished goods:

	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Unfinished goods, MEur	51.5	-5%	48.7	-20%	38.7	13%	44

Table 3. Source: Own elaboration based on data obtained from Siltronic's Annual reports

Receivables are measured at their market value cost, and take into consideration its default risk if they are not covered by insurance or advanced payments received. This

account increases in 2018, and then declines in 2019 due to the company's revenues performance during the mentioned years (Siltronic revenues will be object of further analysis as part of its Income Statement).

Other current assets refer to financial and non-financial assets such as derivative financial instruments, prepaid expenses, other tax receivables and prepayments to the employees' pension fund.

b. Cash and equivalents

According to the Cash Flow statement, the cash flows from operating, investing and financing activities are distributed as follows:

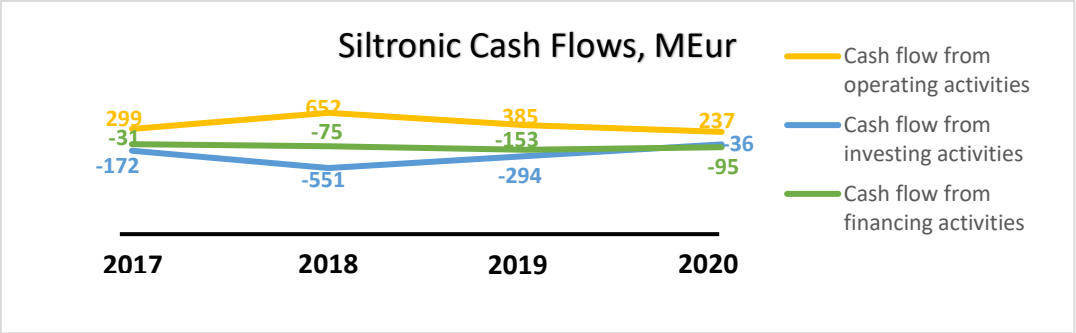

Figure 8. Source: Own elaboration based on data obtained from Siltronic's Cash Flow statement

As we can observe, Siltronic each period generates cash from its operations and expends it on investments and its financing activities. Therefore, we could say that the company is being financed by its main activity.

However, the company does not generate money from investing or financing activities; which shows the firm's efforts it is making in dividends payouts and CAPEX.

The cash flows from investing activities proceed from CAPEX and cash flows from securities and fixed term deposits. In 2018, the company spent MEur 593 in securities, which can also be observed in the Current assets account of the Balance Sheet statement. In 2019 and 2020, the company continues spending cash in securities but also receives cash in this concept.

The following information corresponds to CAPEX during the period:

	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
CAPEX, MEur	129	85%	239	46%	349	-41%	205

Table 4. Source: Own elaboration based on data extracted from Siltronic's Annual reports

Cash flows from financing activities respond to dividend payouts.

4.1.1.3. Shareholder's Equity

Above in the Balance Sheet, we can find the company's Equity distribution, as reported in Siltronic's financial statements. It increased MEur 234, over a 35% during the four years period; with considerable variations from year to year. We are going to focus in the explanation of the firm's retained earnings, other equity interests, and minority interests.

a. Retained earnings

Retained earnings and net group result account is calculated with the accumulation of the net income and the net result of previous periods, after dividend payouts. In order to calculate this number, the company only considers the net income and dividends attributable to Siltronic shareholders, disregarding the minority interest (attributable to non-controlling interests). For example, in 2018:

Retained earnings, January 1st 2018: -270
NI (Profit or loss statement): 400; **NI to shareholders:** 373; **NI to minority interests:** 27
Dividends (Cash Flow statement): 75; **Dividends to shareholders:** 70; **Dividends to minority interests:** 5

Retained earnings, December 31st 2018: -270+373-70=33

Information in MEur; source: Siltronic's Annual report, 2018

*Retained earnings in 2017 show a negative balance, due to previous results; in 2016, Retained earnings at 31st of December was MEur -455.

b. Other equity items

According to the Statement of changes in Equity, the components of the other equity items are the following:

	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
OTHER EQUITY ITEMS (MEur)	**-188**	**-28%**	**-241**	**-41%**	**-339**	**-44%**	**-488**
Difference in foreign currency	-10	-154%	6	420%	29	-221%	-35
Effects of net investments in foreign operations	-7	-	-7	-	-7	-	-7
Market value of derivative financial instruments	11	-175%	-8	-104%	0,3	2900%	9
Remeasurement of defined benefit plans	-182	-27%	-231	-56%	-361	-26%	-455

Table 5. Source: Own elaboration based on the data extracted from Siltronic Annual reports

As we can observe in the table and in the following graph, the variation of the other equity items is driven by the evolution of the remeasurement of defined benefit plans.

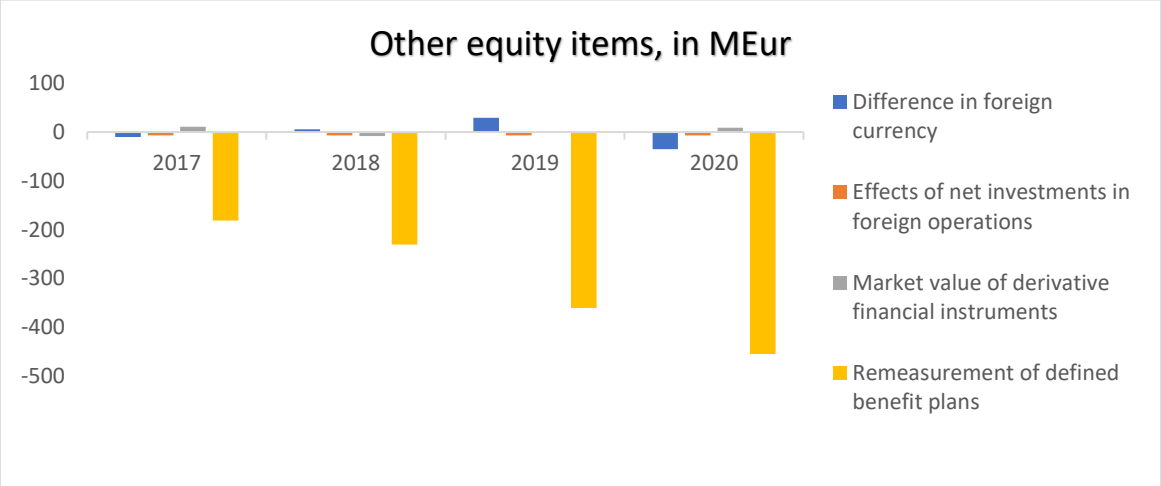

Figure 9. Source: Own elaboration based on data extracted from Siltronic's annual reports

A defined benefit plan is a retirement plan for the employee, sponsored by the employee and payable after the completion of employment; where benefits are measured taking into consideration company and country specific principles and parameters. This computation is based on actuarial variations of the following parameters: discount rate, salary growth rate, and pension growth rate (which varies according to the date the employees enter the company or conclusion of tariff generations).

According to the IFRS Standards, the remeasurements of the net defined benefit plans are recognized as OCI (Other Comprehensive Income). Remeasurement therefore include changes between actuarial assumptions at the end versus the beginning of the reporting period. Siltronic includes this remeasurement it in Statement of Changes in

Equity, and then in the Balance Sheet Statement under the "Other equity items" account.

c. Minority interest

The non-controlling interest, as reported in the Siltronic Annual report, refers to the SSW[6].

4.1.1.4. Liabilities

The company increased its total liabilities MEur 433, over 70% during the 4 years period. We are going to study the performance of the company, first in the non-current liabilities, and then continue with the current.

a. Non-current liabilities

As we can observe in the following graph bellow, non-current assets account has increased during the period, Siltronic has increased its non-current liabilities over 80%, from MEur 462 to 828. Provisions remain constant; therefore, this growth is driven by the evolution of the customer prepayments.

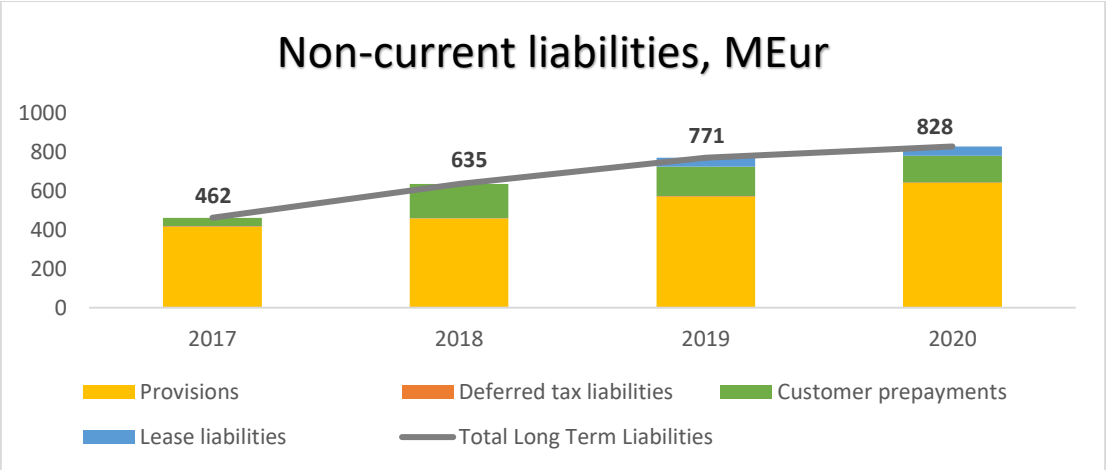

Figure 10. Source: Own elaboration based on data obtained from Siltronic's Annual reports

In 2017, customer prepayments account amounted MEur 43 versus 175 in 2018, therefore it considerably increased during the period. During the following years, this account did not present a great variation.

[6] A minority shareholder (Samsung) owns a non-controlling interest of over 22% in SSW. See section 3.1.1.1.a Intangible assets, for further information of SSW.

Provisions account include provisions for pension plans, for income taxes, personnel and environmental protection (it covers expected burdens due to contamination in Oregon, United States). In 2019, the company introduces lease liabilities account, due to the IFRS 16. Siltronic enters into leasing agreements for machinery, lands, buildings and technical equipment.

b. Current liabilities

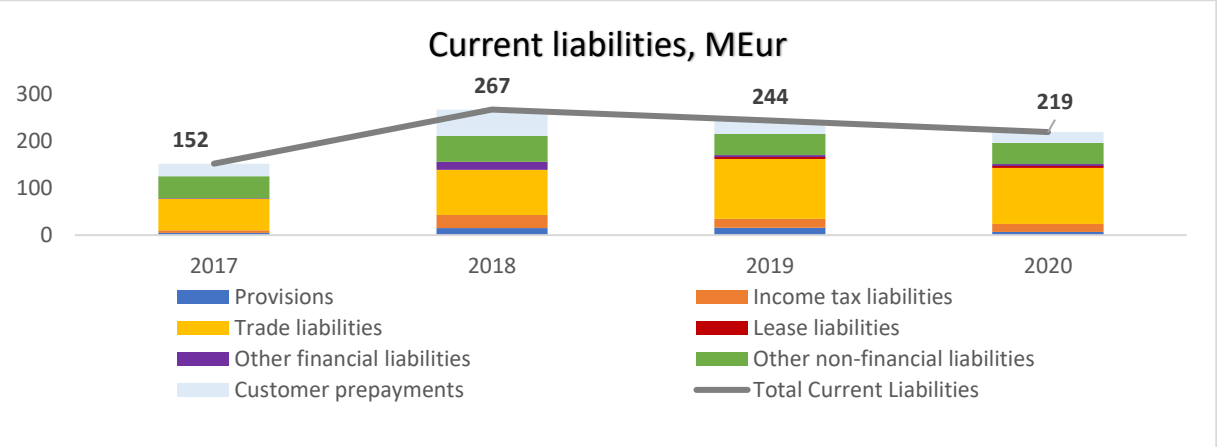

Figure 11. Source: Own elaboration based on data obtained from Siltronic's Annual reports

The table above shows the distribution of Siltronic current liabilities according to its Balance Sheet statement. During the 4-time period, this account increased MEur 67, over 44%. This growth is driven by the variation in the customer prepayments and trade liabilities; since the rest of the accounts have remained more constant, with no significant changes.

4.1.2. Profit or Loss Statement

Income Statement (Jan to Dec), MEur	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Revenue	**1,177**	**24%**	**1,457**	**-13%**	**1,270**	**-5%**	**1,207**
- Cost of Goods Sold	807	2%	825	-1%	813	7%	868
Gross Income	**370**	**71%**	**632**	**-28%**	**458**	**-26%**	**340**
-Selling, General & Admin Expenses	134	5%	140	-3%	136	8%	146
- (Research & Dev Costs)	68	0%	68	0%	68	6%	73
Operating Income	**239**	**109%**	**498**	**-35%**	**325**	**-40%**	**196**
- Interest Expense	1	-33%	1	175%	2	5%	2
- Interest Income	2	111%	4	115%	9	-30%	6
- Currency Exchange Gains (Loss)	3	-100%	0		27	-86%	4
- Net Non-Operating Losses (Gains)	7	16%	9	-178%	-7	-111%	1
Pretax Income	**227**	**115%**	**488**	**-38%**	**303**	**-37%**	**189**
- Income Tax Expense	35	151%	88	-53%	42	-94%	2
tax rate	15.4%	17%	18.0%	-23%	13.8%	-91%	1.3%
NET INCOME	**192.2**	**108%**	**400.6**	**-35%**	**261**	**-28%**	**186.8**

Table 6. Source: Own elaboration based on data extracted from Siltronic's annual report

To conclude with the analysis of the financial statements, we are going to study Siltronic's Income Statement, from 2017 to 2020. As we did with the balance sheet, we have first calculated the percentual variation of the accounts, from year to year, in order to determine its evolution. Once we know if there are significant differences, we will carry out a deep analysis to find out the reasons.

Income Statement (Jan to Dec), MEur	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Revenue	**1,177**	**24%**	**1,457**	**-13%**	**1,270**	**-5%**	**1,207**
Gross Income	**370**	**71%**	**632**	**-28%**	**458**	**-26%**	**340**
Operating Income	**239**	**109%**	**498**	**-35%**	**325**	**-40%**	**196**
NET INCOME	**192.2**	**108%**	**400.6**	**-35%**	**261**	**-28%**	**186.8**

Table 7. Source: Own elaboration based on data extracted from the Siltronic's Income Statement

As we can observe in the table above, the NI has been increasing and decreasing its value during the period; it does not present a constant performance or consistent growth. First, in 2018 the company more than doubled its NI, which increased MEur 208.4. Then, in 2019 Siltronic's NI decreased MEur 139, a 35% of its NI in the previous year. In 2020, the company again reduced its NI, MEur 75.

The company's revenues have also fluctuated during the four years period, but with more reasonable changes from year to year. Siltronic increased its total revenues MEur 280 in 2018 (24%); but again in 2019 and 2020 revenues decreased MEur 187 (13%) in 2019, and, MEur 63 (5%) in 2020. According to the company's annual reports, in 2018, Siltronic grew its revenues after units of wafers sold increased 5% from 2017. However, the amount of wafer units sold shrank by 7% in 2019. In 2020, the pandemic had a positive impact in the number of units sold: first, declines in the individual markets demand (smartphones or vehicles, for example) were offset by the growth in network equipment or home office. The decline of revenues in 2020 is driven by price pressure and the negative impact of currency and exchange rates.

Siltronic's NI performance over the four-year period is a consequence of both, the effect of total sales and its gross margin. It is very remarkable how the gross income specially increased in 2018, 71% from year to year; where gross income was MEur 632 compared to 370 in 2017. In 2019 and 2020 the gross income experienced a decline; first of MEur 174 in 2019 (28% less than the previous year), and MEur 118 in 2020 (26% decrease from 2019). In the following table, we can examine the evolution of the Gross margin over the period:

	2017	2018	2019	2020
Gross margin (Gross Income/Total revenue)	31.5%	43.4%	36%	28.1%

Table 8. Source: Own elaboration based on data obtained from Siltronic's Income Statement

We are going to analyze the segment information of the company's sales, in order to determine if there have been significant differences from year to year in the product portfolio of the company's sales, and be able to understand the reasons underneath the variation of the gross margin.

According to the type of product, Siltronic has only one reportable segment: development, production and sale of semiconductor wafers. The firm offers a wide range and variety of wafers with different specifications; however, it does not have a great impact on gross margin, according to Siltronic's annual reports.

Therefore, I have analyzed the segment information by region in order to see, if the company is able to achieve premium prices in different locations; or, if the gross margin

is affected by exchange rates. It remained constant over the period, without impacts on the gross margin.

Therefore, we can conclude that Siltronic's performance in 2018 was very efficient since it was able to considerably increase its sales without a great change in COGS. However, in 2019 when total revenues decreased, gross margin experiences a remarkable decline.

According to the company, in 2019 gross profit rose significantly due to lower utilization of their production capacity. In addition, energy costs increased approximately MEur 20, contributing to the decline of gross profits and gross margin[7]. Then in 2020, the pandemic had a positive effect on wafer area sold, which increased 5% from previous year. But it was not enough for compensating the decline in revenues due to price pressure in the first half of the year, exchange rate effects and negative impact over the product mix in 2020. Therefore, higher COGS are caused by the increase of sales. However, since the company was not able to convert the increase of sales into revenues growth, its gross margin is considerably lower (28% in 2020, versus 36% in 2019 as we have seen before). According to Siltronic's press release in 09.03.2021 about close of financial year 2020, the increase in cost of sales is driven by higher wafer area sold, and, cost of sales per wafer decreased from 2019, due to cost reduction programs[8].

The operating income refers to the result of the gross income, after S&A, R&D expenses, and other operating income and expenses. We can find bellow, information about R&D expenses presented by Siltronic along the period:

MEur	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
R&D TO REVENUE RATIO	**6%**	**-**	**5%**	**-**	**5%**	**-**	**6%**
R&D expenses	68	0%	68	0%	68	6%	73
Revenue	1,177	24%	1,457	-13%	1,270	-5%	1,207

Table 9. Source: Own elaboration based on data obtained from Siltronic's Income Statement

[7] Sources: Siltronic Annual report 2020, and Siltronic press release 24.10.19: *https://www.siltronic.com/en/press/press-releases/siltronic-meets-sales-and-margin-expectation-in-a-difficult-market-environment-1.html*

[8] Press release in 09.03.2021: *https://www.siltronic.com/en/press/press-releases/siltronic-schliesst-geschaeftsjahr-2020-im-rahmen-der-erwartungen-ab-dividende-von-eur-200-je-aktie-vorgeschlagen.html*

This table shows the R&D of the company, as well as the percentage of total revenues that the company allocates in this concept. We will carry out further analysis of this ratio, in comparison with Infineon in the Section 4 of this Paper.

To conclude with the analysis of Siltronic's statement of Profit or loss, we are going to review its financial result. The following graph, shows how the NI increases, in comparison with the company's Operating income:

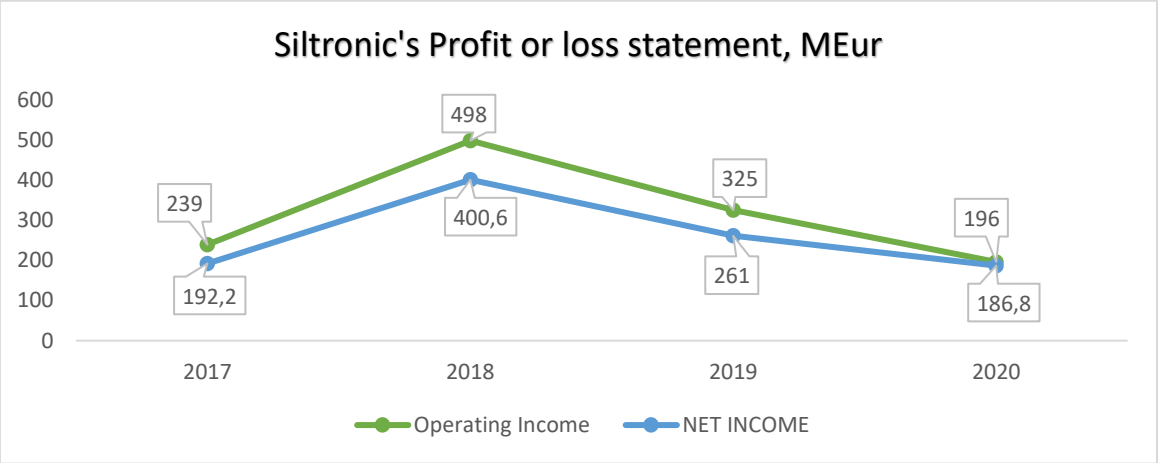

Figure 12. Source: Own elaboration based on data extracted from Siltronic's Annual reports

As we can observe, both present a similar evolution along the period; therefore, the influence of financial result as a percentage of NI, is relatively constant. We can see in the graph that in 2020, the difference between NI and Operating Income is lower than in previous years; it can be explained by an increase in interest income generated by financial investments and securities.

4.2. INFINEON

4.2.1. Balance Sheet

Balance Sheet (September 31st, MEur)	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Total Current Assets	**4,871**	**11%**	**5,423**	**38%**	**7,493**	**-4%**	**7,179**
Inventories	1240	19%	1480	15%	1701	21%	2052
Contract assets	-	-	-	-	91	7%	97
Receivables	851	14%	971	9%	1057	13%	1196
Financial investments	1592	14%	1811	52%	2758	-50%	1376
Income tax receivables	5	940%	52	60%	83	-7%	77
Cash	860	-15%	732	39%	1021	81%	1851
Other current assets	300	22%	366	110%	770	-31%	530
Assets clasified as held for sale	23	-52%	11	9%	12	-100%	0
Total Long-Term Assets	**5,074**	**8%**	**5,456**	**12%**	**6,088**	**143%**	**14,820**
Goodwill and intangible assets	1586	1%	1596	13%	1805	427%	9518
PPE	2659	14%	3038	16%	3510	17%	4110
Right-of use assets		-		-		-	286
Investments accounted using the equity method	28	32%	37	-22%	29	200%	87
Other assets	189	-28%	137	6%	145	32%	191
Deferred tax assets	612	6%	648	-8%	599	5%	627
TOTAL ASSETS	**9,945**	**9%**	**10,879**	**25%**	**13,581**	**62%**	**21,999**
Total Current Liabilities	**2,098**	**4%**	**2,182**	**1%**	**2,213**	**56%**	**3,450**
+ Accounts Payable	1,020	16%	1,181	-8%	1,089	7%	1,160
+ Short Term Borrowings	323	-92%	25	-12%	22	2464%	564
+ Other Short Term Liabilities	755	29%	976	13%	1,102	57%	1,726
Total Long Term Liabilities	**2,211**	**2%**	**2,251**	**22%**	**2,735**	**205%**	**8,330**
+ Long Term Borrowings	1,511	0%	1,507	2%	1,534	341%	6,763
+ Other Long Term Borrowings	700	6%	744	61%	1,201	30%	1,567
Total Liabilities	**4,309**	**3%**	**4,433**	**12%**	**4,948**	**138%**	**11,780**
Share capital	2272	0,1%	2274	10%	2501	4%	2612
Additional paid-in capital	4774	-6,03%	4486	22%	5494	18%	6462
Hybrid capital	-	-	-	-	-	-	1203
Acc. Deficit/ retained earnings	-1404	-76%	-333	226%	421	3%	435
Other reserves	31	81%	56	354%	254	-281%	-460
Own **shares**	-37	0%	-37	0%	-37	11%	-33
Shareholders' equity	**5636**	**14%**	**6446**	**34%**	**8633**	**18%**	**10219**
Total Liabilities & Equity	**9,945**	**9%**	**10,879**	**25%**	**13,581**	**62%**	**21,999**

Table 10. Source: Own elaboration based on data extracted from the the annual reports

As we previously introduced, this company presents four segments of main activity: automotive, industrial power control, power management & multimarket, and digital security solutions.

Infineon experiences a significant increase during the period; its total assets grew from MEur 9,945 in 2017 to 21,999 in 2020. The company kept increasing its assets year after year, but specially in 2020 where total assets rose 62%, MEur 8,418 from previous year.

We are going to carry out further analysis of the financial statements, in order to determine which factors have affected this steep growth. In the following graph, we can see the evolution of Infineon's assets (current and non-current):

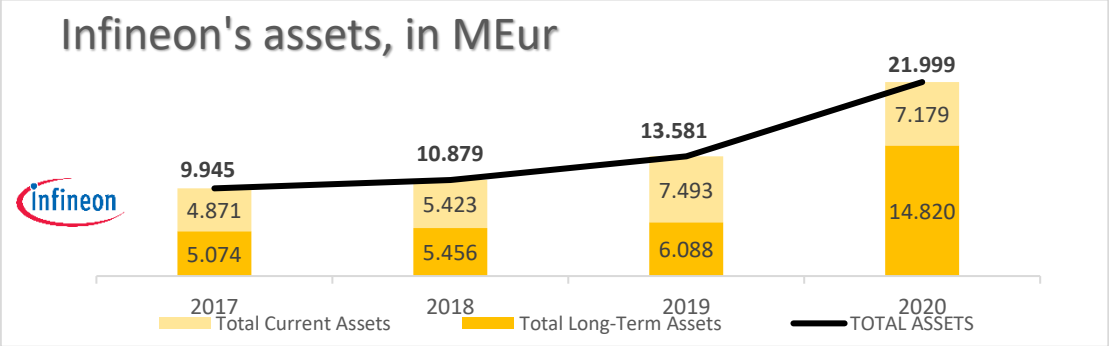

Figure 13. Source: Own elaboration based on data extracted from the Balance Sheet

The non-current assets increased from MEUR 5,074 in 2017 to MEur 14,820; most of this increase was achieved in 2020, in this year Infineon's assets incremented MEur 8732, a 140%. Its current assets have also been rising year after year, but presenting a more moderate growth, from MEur 4,871 in 2017 to MEur 7,179 in 2020, a 47%.

In the following graph, we can observe the performance of Infineon's liabilities and equity from 2017 to 2020:

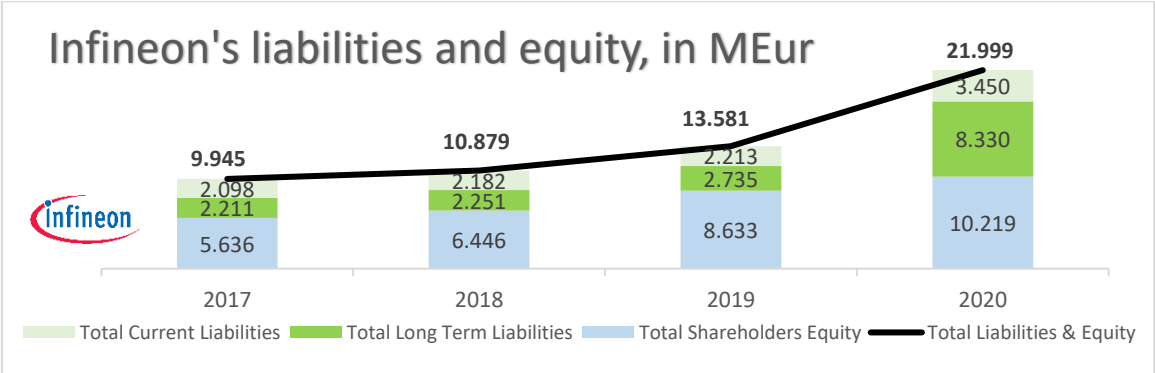

Figure 14. Source: Own elaboration based on data extracted from the Balance Sheet

The company has increased its non-current liabilities over 270%, from MEur 2,211 in 2017, to MEur 8,330 in 2020; and its equity over 80%, from MEUR 5,636 in 2017, to MEur 10,219 in 2020. As with its assets, 2020 is a remarkable year, leading a significant part of this growth.

As we did with Siltronic, we are going to analyze the company's current and non-current assets, equity and total liabilities.

4.2.1.1. Non-current Assets

First, we are going to proceed with the analysis of the non-current assets, reviewing the information that Infineon reports.

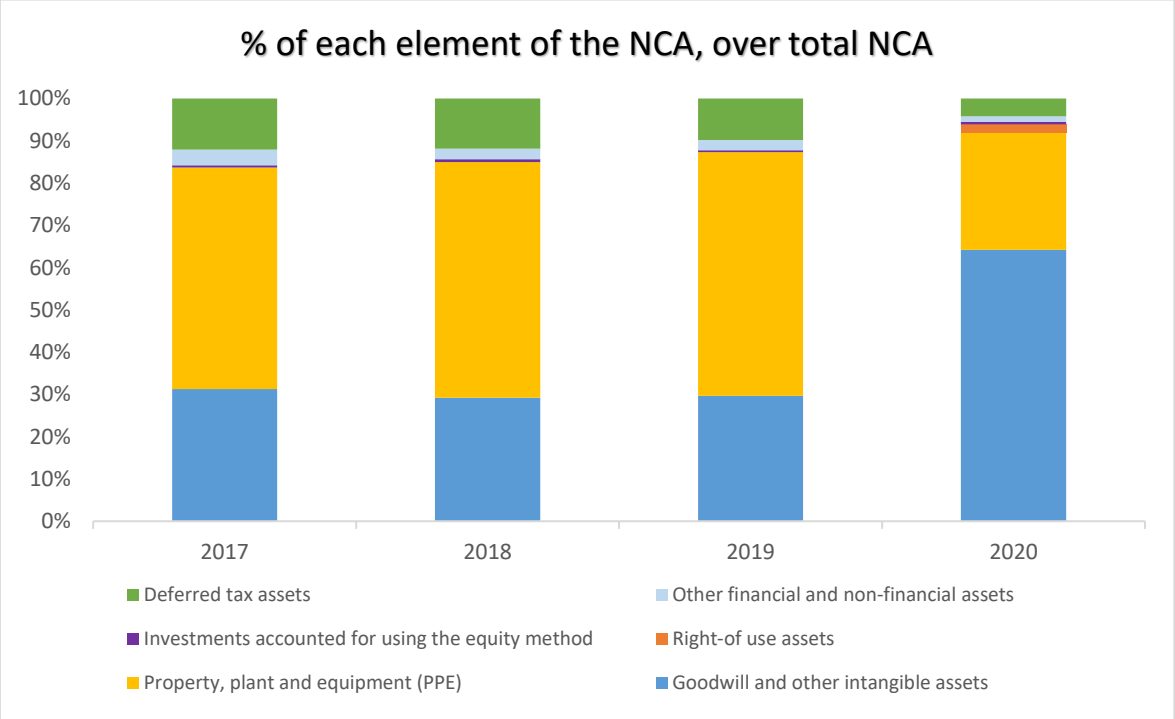

Figure 15. Source: Own elaboration based on data obtained from Infineon's Annual reports

As we can observe in the graph above, the most important accounts in total non-current assets are PPE and goodwill, therefore we are going to focus on the analysis of its performance over the four years.

a. Goodwill and other intangible assets

In 2017, goodwill and other intangible assets amounted MEur 1,586; in 2018 this account experienced a slight increase; then, in 2019 after growing 13%, goodwill was MEur 1,805. More than 90% of goodwill is allocated to the Power Management & Multimarket segment.

In 2020, goodwill amounted MEur 5,897, and other intangible assets MEur 3,621. Goodwill increased MEur 4,988 resulting exclusively from the acquisition of Cypress in April, 2020[9]. According to the company, this purchase positions them as a global top 10 semiconductor company. With this acquisition, Infineon's aim is to complete its portfolio in customer (entertainment and communication), automotive and industrial segments.

b. Property, plant and equipment (PPE)

As we have seen, PPE is a very important element in the company's non-current assets. This account increased first, MEur 379 in 2018, MEur 472 in 2019, and MEur 600 in 2020. In 2020, over MEur 250 of the amount increased results from the acquisition of Cypress.

In order to understand the components of this account, and how the company has decided to invest in the main elements of its PPE, we can study the following graph:

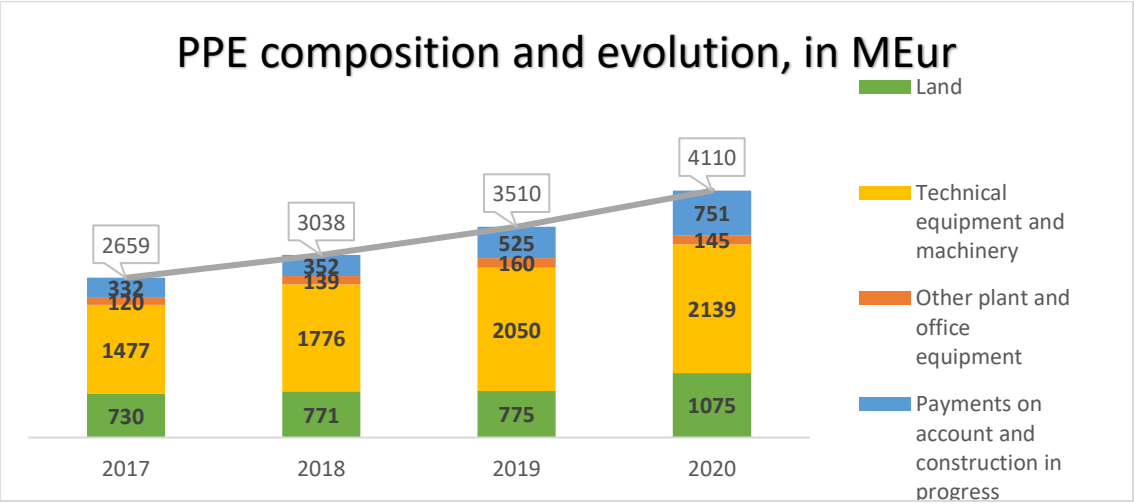

Figure 16. Source: Own elaboration based on data extracted from Infineon's

As we can observe, technical equipment and machinery is the account which has experienced greater growth year to year. Furthermore, in 2020 Infineon lands and assets under construction considerably increase. Now, we have more information about the distribution of this account and how it has evolved along the period; however, the company did not report information about segments or locations where PPE growth was more significant; or projects which brough these increases in PPE.

[9] Sources: Infineon's web page https://www.infineon.com/cms/en/about-infineon/company/cypress-acquisition/; Infineon' press release, November, 9th, 2020: https://www.infineon.com/cms/en/about-infineon/press/press-releases/2020/INFXX202011-013.html; and, Infineon's annual report, 2020

c. Right of use assets

As we can observe, this account was created for 2020 annual report, in order to meet the IFRS 16 leases standards, which the company has applied since 1 October 2019 (note that Infineon reports its financial information from October to September of the following year).

d. Investments accounted for using the equity method

Infineon reported under this account shares from the joint venture Infineon Technologies Bipolar GmbH & Co. KG, and SAIC Infineon Automotive Power Modules (Shangai) Co., Ltd.[10]

First of the mentioned joint ventures, is allocated to the Industrial segment, and is registered in Germany. Infineon holds 60% by using the equity method, as the company lacks certain controlling influence.

The other joint venture refers to the Automotive segment, and is located in China. In this case, the company owns 49% of the joint venture's shares.

4.2.1.2. Current Assets

In order to analyze the performance of the company's current assets, I have elaborated the following graph, which shows the components of this account:

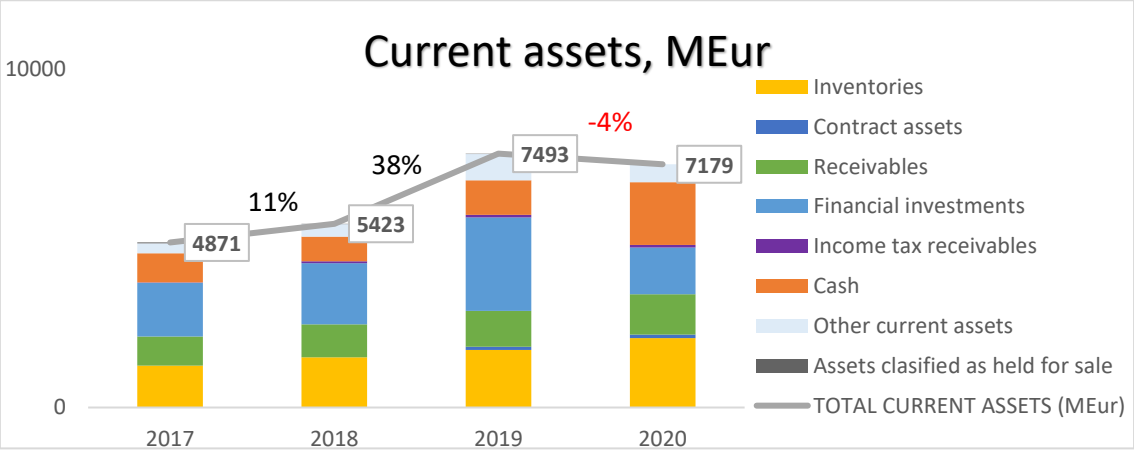

Figure 17. Source: Own elaboration based on data obtained from Infineon's annual reports

[10] Source: Infineon's annual reports

As we can observe, total current assets increased from MEur 4,871 in 2017 to MEur 7,179 in 2020, almost 50%. This account first rose in 2018 and 2018, but then decreased in 2020.

It can be seen in the graph above, that financial investments are one of the main components of the current assets account, due to their meaningful amount. Furthermore, financial assets present significant variations from year to year.

a. Trade receivables, inventories and other current assets

It can be seen in Balance Sheet statement that these accounts remain relatively constant during the period.

The following information is reported by Infineon, as the different types of inventories during the period:

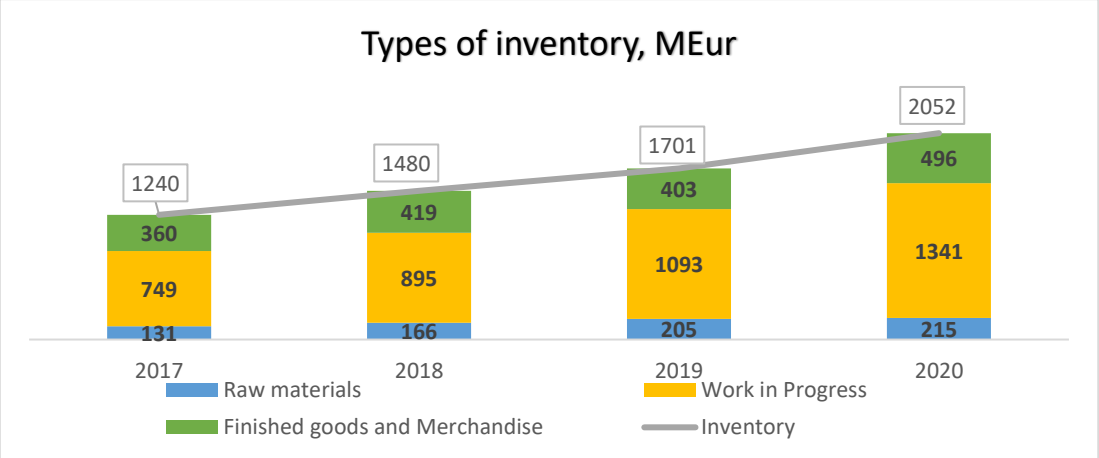

Figure 18. Source: Own elaboration based on data obtained from Infineon's annual reports

Trade receivables increase from MEur 1,240 in 2017 to MEur 2,052 in 2020; with variations of over 10% from year to year. This growth is mainly driven by an increase in Infineon's sales (revenues will be object of further analysis, as part of the Net Income statement).

As we have previously introduced, in 2020 Infineon integrated Cypress. The company decided not to compensate the obligations with clients against trade receivables; therefore, obligations with clients are reported as current liabilities; as trade receivables as current assets.

Other current assets account consists of derivatives, VAT receivables, prepaid expenses and grants received. In 2019, this account increased by MEur 434, more than a 100% of the amount its previous year. This growth is driven by a considerable increase in derivative instruments (from MEur 3 to MEur 215), prepaid expenses and grants. The increase of derivative and hedging instruments in 2019, is used as a tool in order to reduce the impact of exchange rate risks related to the planned acquisition of Cypress in 2020.

b. Cash and equivalents

According to the Cash Flow statement, the cash flows from operating, investing and financing activities are distributed as follows:

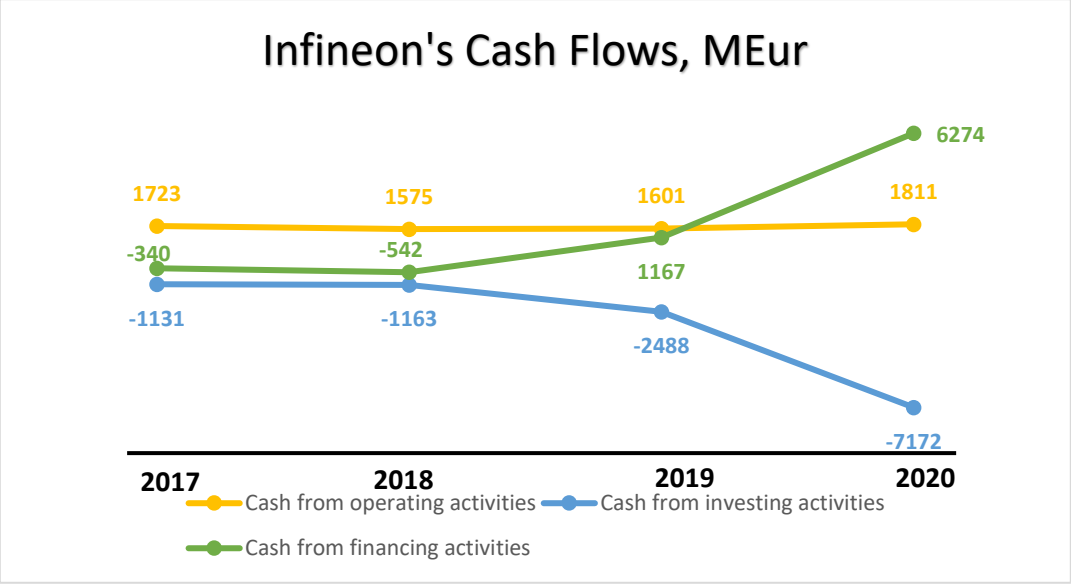

Figure 19. Source: Own elaboration based on data obtained from Infineon's Cash Flow Statement

As we can observe, Infineon is making cash from its operating activity during the period; however, cash flows from investing and activities present a negative balance. Cash flows from financing activities also presented negative cash balance in 2017 and 2018, but then company generated cash from these activities in 2019 and 2020.

From the company's Cash Flow statement, we can deduce that the main component in the cash flows from financing activities are the purchases of PPE (note that PPE account has been subject of further analysis, as a component of non-current assets).

In 2017 and 2018, cash flows from financing activities came from long term debt repayments and dividend payouts. Then, in 2019 the company registered positive cash

flows from the issuance of ordinary shares (note that Share capital will be subject of further analysis, as a component of equity); in 2020 the company received cash from the issuance of a long-term debt as financing activity.

c. Financial assets

Financial investments include fixed-term deposits, investment funds and securities. In 2019, the company decided to increase its investment funds by MEur 1,624; leading to significant growth (50%) of financial current assets.

4.2.1.3. Shareholder's Equity

The table above presents Infineon's equity distribution, as it is reported in the company's annual reports. Total shareholders' equity increased MEur 4,583 from 2017 to 2020, over 80%. In order to determine the factors that resulted in this growth, we are going to carry out deep analysis of each of the elements of equity account.

a. Share capital and Additional paid-in capital

In 2019 and 2020, the company decided to increase its Share capital, by the issue of no-par value shares in exchange for cash. As a result, share capital rose MEur 338 from 2018 to 2020.

In 2018, additional paid in cash decreased MEur 288 due to dividend payout in February of this year. Then, the increase in this account in 2019 and 2020 is a result of the new shares issued.

b. Accumulated deficit/ Retained earnings

Accumulated deficit or retained earnings is computed with the accumulated net result of previous years, with the current year's net income. In order to compute it, Infineon considers the net income attributable to the shareholders and the actuarial gains or losses on pension plans. As we did with Siltronic's retained earnings, we are going to study 2018 as an example:

Accumulated deficit, January 1st 2018: -1,404
NI (Profit or loss statement): 1,075; **NI to shareholders:** 1,075;
Actuarial gains or losses on pension plans (Consolidated Statement of Comprehensive Income): -4

Accumulated deficit, September 30th 2018: -1,404+1,075-4= -333

Information in MEur; source: Infineon's Annual report, 2018

*Retained earnings in 2017 show a negative balance, due to previous results; in 2016, Accumulated deficit at 31st of December was MEur -2,312.

c. Other reserves

In 2019, changes in reserves amounted and increase of MEur 198, of which, MEur 155 corresponded to unrealized gains from hedge accounting, resulting from the deal contingent option of the price obligation for the acquisition of Cypress (as we have seen, this transaction also affected the current financial assets account). Most of capital reserve's decline in 2020, is due to the foreign currency translation difference; and, to realized and unrealized losses as a result of hedge accounting.

4.2.1.4. Liabilities

During the four years period the company rose its total liabilities MEur 7,471, over 170%. In order to determine the reasons underneath this account's performance, we are going to study the evolution of both, current and non-current liabilities.

a. Non-current liabilities

Non-current assets increased MEur 6,119 in 4 years. As we can observe from the graph bellow, every year from 2017 to 2020, Infineon's long-term liabilities have increased; however, we can point out year 2020 because it is responsible for most of non-current liabilities' growth over the four years period. In fact, it is the long-term debt account the main reason underneath the meaningful increase of non-current assets.

In 2020, the company needed to finance the acquisition of Cypress. Therefore, in the previous year, 2019, Infineon agreed to issue long-term loans with German and international banks. In addition, Infineon issued different bons due from 2022 to 2032, which in total amount MEur 3,364.

The remaining elements of the non-current liabilities remained relatively constant over the four years period; presenting reasonable variations year to year, as we can see in the following graph.

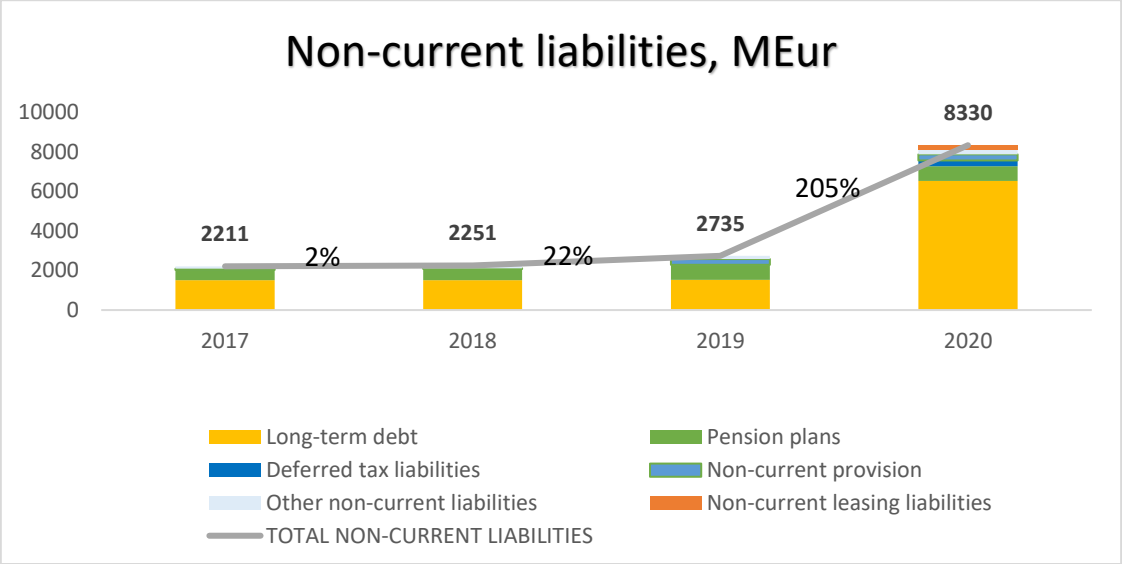

Figure 20. Source: Own elaboration based on data obtained from Siltronic's Annual reports

b. Current liabilities

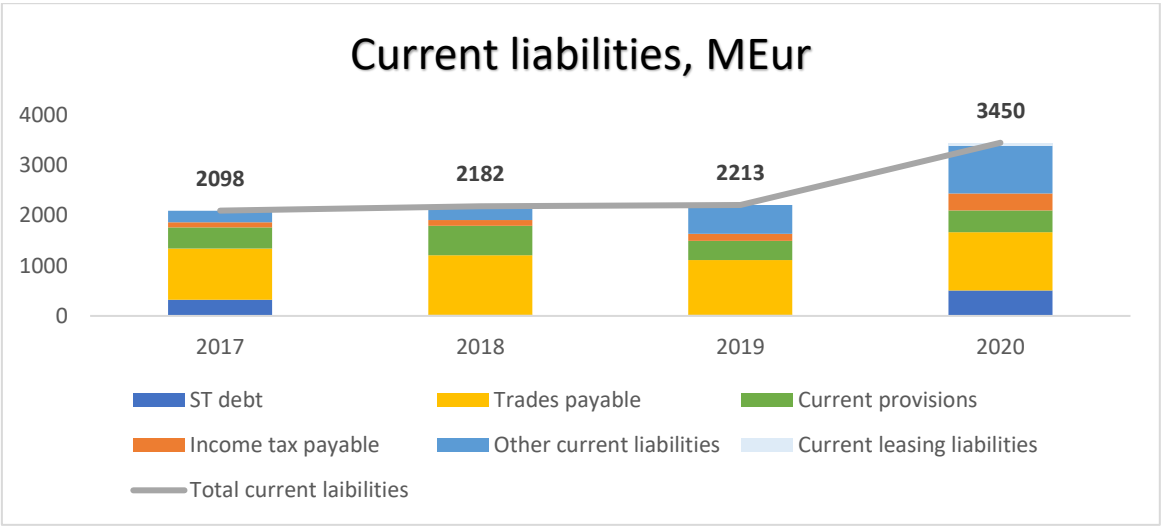

Figure 21. Source: Own elaboration based on data obtained from Siltronic's Annual reports

This graph presents the evolution of current liabilities over the period; and we can observe that current liabilities do not present relevant variations from 2017 to 2019, but again 2020 is a remarkable year regarding the performance liabilities. In 2020, total current liabilities rose MEur 1,237, over 55%.

We can highlight short term debt and other current liabilities, as the elements which most have increased in 2020.

Short term debt grew from MEur 22 in 2019, to MEur 505 in 2020. As we saw in the analysis of non-current liabilities, Infineon issued several loans with financial institutions; as a result, long and short-term debt have considerably increased during this year. On the other hand, reimbursement obligations from other current liabilities rose MEur 236 in 2020, as a result of the integration with Cyprus. Infineon decided to not offset the reimbursement of obligations caused by the acquisition with the trade receivables; thus, this element is recorded under other current assets.

4.2.2. Profit or loss Statement

Income Statement (from Oct to Sept), MEur	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Revenue	**7.063**	**8%**	**7.599**	**6%**	**8.029**	**7%**	**8.567**
- Cost of Goods Sold	4.442	6%	4.714	7%	5.035	15%	5.791
Gross Income	**2.621**	**10%**	**2.885**	**4%**	**2.994**	**-7%**	**2.776**
- S&A Expenses	1.652	6%	1.748	8%	1.889	20%	2.271
(Research & Dev Costs)	776	8%	836	13%	945	18%	1.113
Operating Income	**983**	**49%**	**1.469**	**-21%**	**1.161**	**-50%**	**581**
- Interest Expense	63	8%	68	-9%	62	118%	135
- Interest Income	10	50%	15	73%	26	12%	29
- Net Non-Operating Losses (Gains)	-13	-23%	-10	-260%	16	38%	22
Pretax Income	**933**	**51%**	**1.411**	**-23%**	**1.083**	**-61%**	**424**
- Income Tax Expense	142	36%	193	1%	194	-73%	52
tax rate	15,2%	-10%	13,7%	31%	17,9%	-32%	12,3%
NET INCOME	**791**	**54%**	**1218**	**-27%**	**889**	**-58%**	**372**

Table 11. Source: Own elaboration based on data extracted from the Annual reports

As we did with Siltronic, with the aim of analyzing Infineon's Profit or loss statement, we are going to study the percentual variation of the accounts from year to year. Once we know about the differences in the most important accounts, we will determine the reasons and factors behind the performance of the Income Statement.

Income Statement (Oct to Sept), MEur	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Revenue	7.063	8%	7.599	6%	8.029	7%	8.567
Gross Income	2.621	10%	2.885	4%	2.994	-7%	2.776
Operating Income	983	49%	1.469	-21%	1.161	-50%	581
NET INCOME	791	54%	1218	-27%	889	-58%	372

Table 12. Source: Own elaboration based on data extracted from the Infineon's Income Statement

We can observe in the table that NI first experienced a decline of MEur 419 from 2017 to 2020, accounting over a 50% reduction from the NI. First in 2018, NI rose MEur 427; however, it decreased MEur 329 and 517, in 2019 and 2020, respectively.

First of all, we are going to focus on the performance of Infineon's revenues over the period. This account presented consisted growth of over 7% year after year. Therefore, the NI fluctuations are not related to drop of sales.

Gross income shows more variations; it increases 10% and 4%, in 2018 and 2019, respectively, but then decreases 7%, in 2020. In the following table, we can find the performance of the gross margin, year after year:

	2017	2018	2019	2020
Gross margin (Gross Income/Total revenue)	37 %	38%	37%	32%

Table 13. Source: Own elaboration based on data extracted from the Infineon's Income Statement

The gross margin is relatively stable over the period, but lower in 2020; 37% in 2019, versus 32% in 2020. In order to achieve a better understanding of the gross margin, we are going to analyze the company's product mix, regarding its sales over the period.

Meur	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
Automotive							
Revenue	2.989	10%	3.284	7%	3.503	1%	3.542
Segment result	474	-2%	466	-13%	404	-62%	155
Result margin[11]	16%		14%		12%		4%
Industrial Power Control							
Revenue	1.206	10%	1.323	7%	1.418	-1%	1.406
Segment result	183	40%	256	-2%	251	2%	256
Result margin	15%		19%		18%		18%
Power management and multimarket							
Revenue	2.148	8%	2.318	5%	2.445	8%	2.650
Segment result	427	25%	532	10%	585	9%	636
Result margin	20%		23%		24%		24%
Security solutions							
Revenue	708	-6%	664	-3%	642	48%	953
Segment result	124	-15%	105	-27%	77	58%	122
Result margin	18%		16%		12%		13%

Table 14. Source: Own elaboration based on data extracted from the Infineon's Annual reports

[11] Result margin=$\frac{\text{Result}}{\text{Revenue}}$

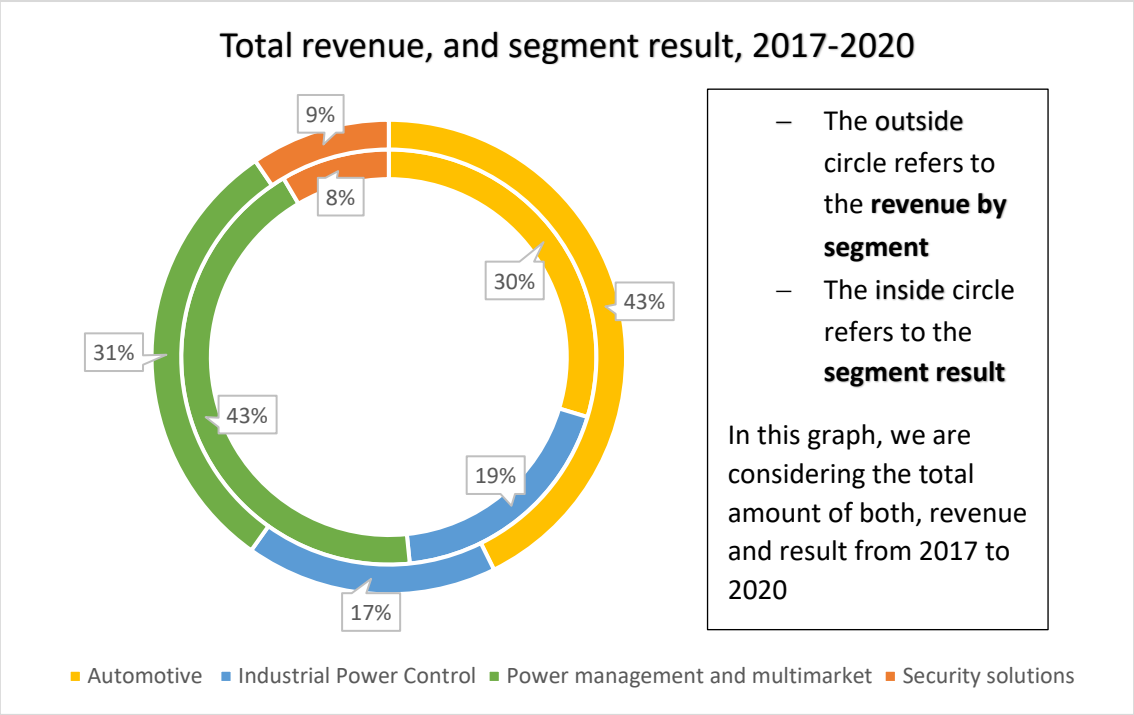

Figure 22. Source: Own elaboration based on data extracted from the Infineon's Annual reports

From the graph above, we can compare contribution of each segment to total revenues and result of the company, during the four years period (2017-2020). Before making conclusions from the information shown in the graph, we should take into consideration that company defines as segment result the operating losses of each of their segments; however, the computation of the result by segment disregards several impairment losses (for example, impairment losses on goodwill), and other expenses which the company includes in the operating income. Therefore, we cannot find in the Profit or loss statement an account which includes the same information as the segment result, but could be compare to the operating income of each segment.

As we can see, the most profitable segment for the company is Power Management, which on average has represented the 30% of total revenues, during this period, but a 43% of the company's result. On the other hand, the automotive sector which is the most important segment for the company's sales (over a 40%), is only a 30% of its result. We can observe from the table above that, on average, the result margin is over the 15%. Power management presents a result margin around 20-25% during the four years period. And, the factor that led the decline of the company's gross margin in 2020, is a considerable decline in the automotive sector result margin, which was only 4%, which involves a decrease around 60% from the previous year. This also affects to the

profitability of the automotive sector over the period. This loss of profitability results from the coronavirus pandemic, which has dangerously affected the car sector (according to HIS Markit, the global vehicle production fell by around 20%). According to Infineon, the decrease of segment result margin is due to idle costs. However, the effect of this crisis was compensated with the trend of new assistance systems, which increase comfort and electrification of the vehicles. Therefore, the company has noticed an increase on the value of semiconductor content by vehicle, which increased form US$ 417 in 2019 to US$ 457 in 2020.

To continue with the analysis of the Profit or loss statement, we are going to study the evolution of the company's R&D expenses:

	2017	CAGR 2018	2018	CAGR 2019	2019	CAGR 2020	2020
R&D TO REVENUE RATIO	**11%**	**-**	**11%**	**-**	**12%**	**-**	**13%**
R&D expenses	776	8%	836	13%	945	18%	1.113
Revenue	7.063	8%	7.599	6%	8.029	7%	8.567

Table 15. Source: Own elaboration based on data obtained from Infineon's Income Statement

As we can observe from the previous period, Infineon is a capital-intensive company that assigns more than 10% of their total revenues to R&D expenses, year after year. We will study this ratio, in comparison with Siltronic, in the Section 4 of this Paper

We are going to proceed with the analysis of the Profit and loss statement, we are going to evaluate its financial income and expenses. I have elaborated the following graph, comparing Infineon's NI with its operating result, as I did with Siltronic; with the aim of getting knowledge about the impact of the financial result over the NI during the period.

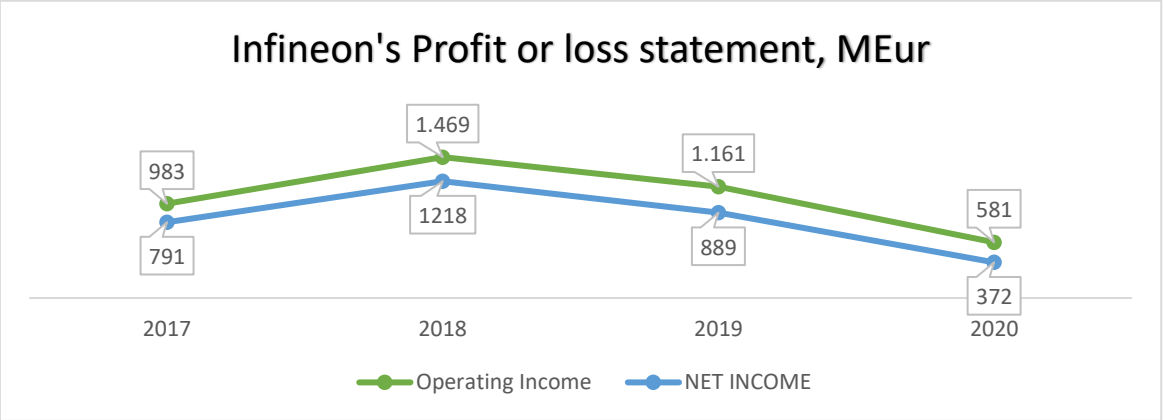

Figure 23. Source: Own elaboration based on data obtained from Infineon's Income Statement

We can observe from the graph above that this company presents a constant relation between Operating result and NI; therefore, the impact of its financial result is similar year after year.

After this approach of the company, that we acquired with the analysis of its Income statement, we are going to see what happened with the NI over the period.

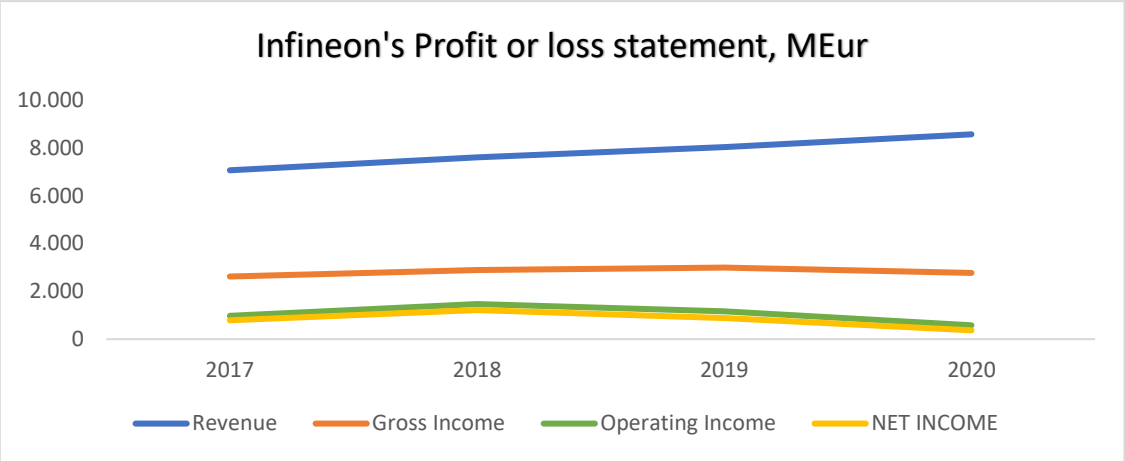

Figure 24. Source: Own elaboration based on data obtained from Infineon's Income Statement

As we have seen, the revenues show a constant performance of stable growth; and, the company's gross margin is consistent, disregarding 2020 as a result of the coronavirus' impact over the automotive segment. However, the company is unable to transfer this growth to its NI. As we saw, the company keeps rising its R&D expenses year after year, without taking into consideration the performance of the gross income during the period. In fact, R&D growth is higher than the gross income's increase; as a result, the operating income falls from 2018 to 2019, and again, in 2020. Therefore, in 2020 the NI decreased around 60%, because the company was incapable of maintaining its gross margin but increased its R&D expenses. The companies that operate in the semiconductor sector are very capital intensive, and from my view point, this could be considered as a weakness. These firms need to assign resources to CAPEX and R&D in order to be competitive; so, if the company presents problems with its revenues or gross income, its profitability will be negatively affected.

5. COMPARISON OF THE FIRMS BASED ON THEIR FINANCIAL INFORMATION (RATIOS)

Once we have acquired a deep knowledge about the companies, its main activity and their financial statements we are going to compare their performance over the period, taking into consideration different financial ratios.

These ratios which we are going to analyze have seen selected due to their relevance in the sector in which these two companies operate; and can be classified according to the information and approach they give us about the firms.

5.1. LIQUIDITY RATIOS

Liquidity ratios show the company's ability to assume its current liabilities. Liquidity refers to the capability of a firm to convert an asset into cash, in order to meet its short-term obligations.

5.1.1. CURRENT RATIO

It determines if a company is capable to pay with its current assets, the current liabilities; therefore, this ratio identifies liquidity issues.

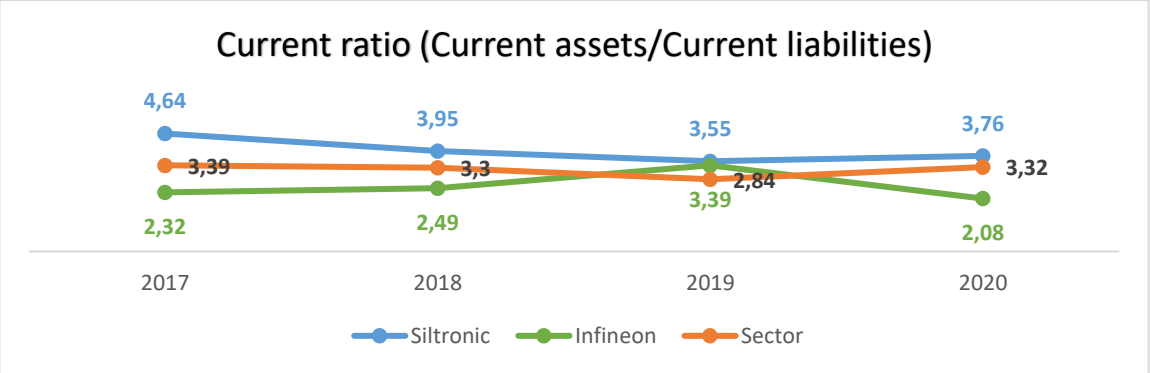

Figure 25. Source: Own elaboration based on the data from the companies' Annual reports

Both companies are capable of covering their current debt with current assets. Siltronic and Infineon's result is aligned with the average of the sector (3.32 in 2020); in fact, Infineon's current ratio is slightly below. In order to interpret this ratio, it is very important have knowledge about the industry levels. If a company presents significantly lower results, exists default risk; on the other hand, if it is very high, the management of the assets could be considered as inefficient.

5.1.2. QUICK RATIO OR ACID TEST

This ratio compares the current obligations with quick assets, that is, assets that can be transformed easily into cash. In order to compute this ratio, we are going to consider cash and Trade receivables, disregarding other elements in the current assets account.

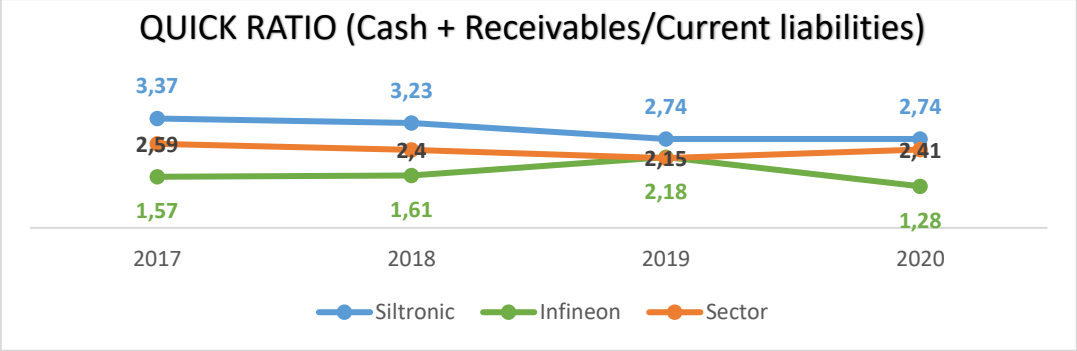

Figure 26. Source: Own elaboration based on the data from the companies' Annual reports

Again, both companies are liquid and able to meet their debt due in a year with cash and trade receivables; and, their results are in line with the industry.

*We are using as information of the sector an average of the industry ratio for USA listed companies which operate in the semiconductor business and related services.

5.2. SOLVENCY RATIOS

These ratios give us information about the ability of a company to meet its obligations, from a long-term perspective, taking into consideration the non-current accounts of the Balance sheet statement.

5.2.1. Debt-to-Equity

It compares total liabilities of a company with its shareholders' equity and can determine the amount of leverage that a company uses.

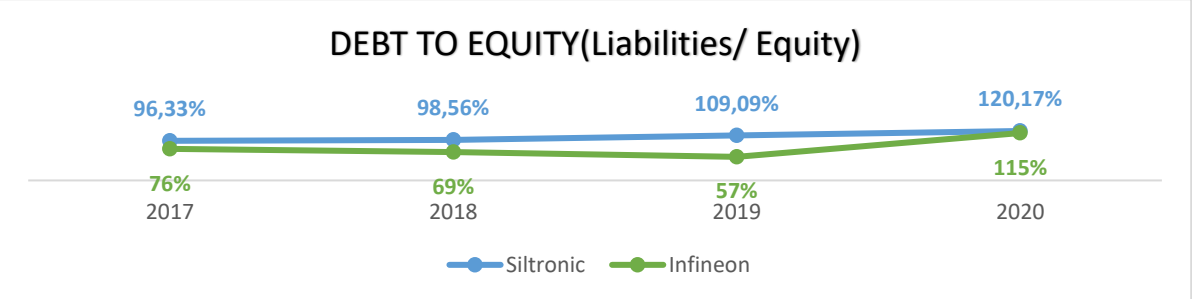

Figure 27. Source: Own elaboration based on the data from the companies' Annual reports

We can observe from the graph how Siltronic shows higher results for this ratio, which means that it is financing its operations with larger amount of debt, which is riskier for the company's shareholders. Infineon presents a step growth in 2020 due to the issuance of debt, for Cyprus acquisition.

5.2.2. Debt-to-Capital

This ratio makes a comparison of total liabilities with the assets of a firm's Balance sheet statement; therefore, it assesses its ability to face liabilities with its total assets.

Companies aim to have a low result in this ratio, since the company will need to sell less assets in order to pay the creditors and will be considered solvent.

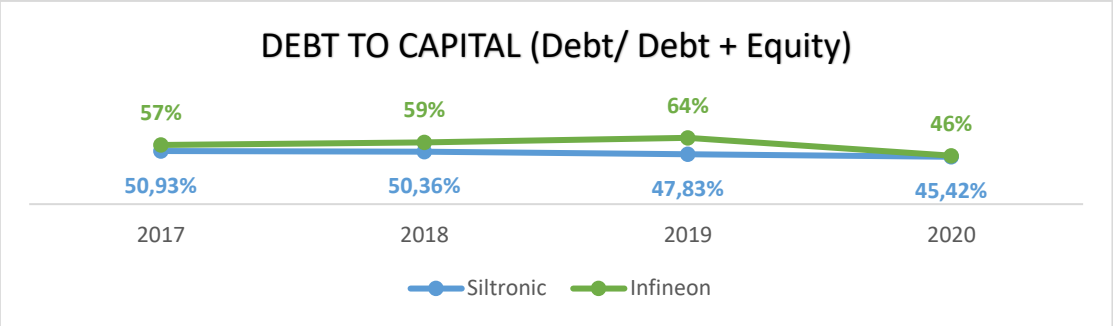

Figure 28. Source: Own elaboration based on the data from the companies' Annual reports

In this case, both companies show similar results of the ratio (being higher for Infineon); and consistent over the period. In this case, the higher this ratio is, the riskier the firm. When this ratio is high, the company is financed by a large amount of debt which needs to be repaid and generates interests.

5.3. RETURN RATIOS

5.3.1. ROA (Return on Assets)

This ratio measures the efficiency of a company in relation to its assets, and its ability to convert them into profits.

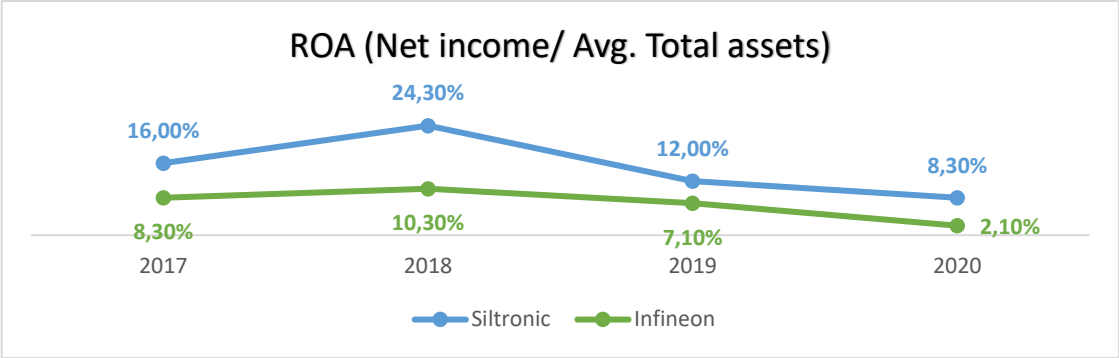

Figure 29. Source: Own elaboration based on the data from the companies' Annual reports

According to this ratio, Siltronic is more productive in the management of the assets. From my viewpoint, Infineon presents lower results because it is more capital intensive; therefore, the proportion of assets is higher; which results in lower ROA. In any case, Infineon should consider new strategies to improve their ROA in 2020 (note that, as we have been, in 2020 Infineon's NI declined more than a 50%).

5.3.2. ROE (Return on Equity)

ROE evaluates how efficient the company is in the creation of profits, therefore it estimates the financial performance of a company. Since equity can be computed subtracting debt to a company's assets, ROE is also treated as the return on net assets ratio.

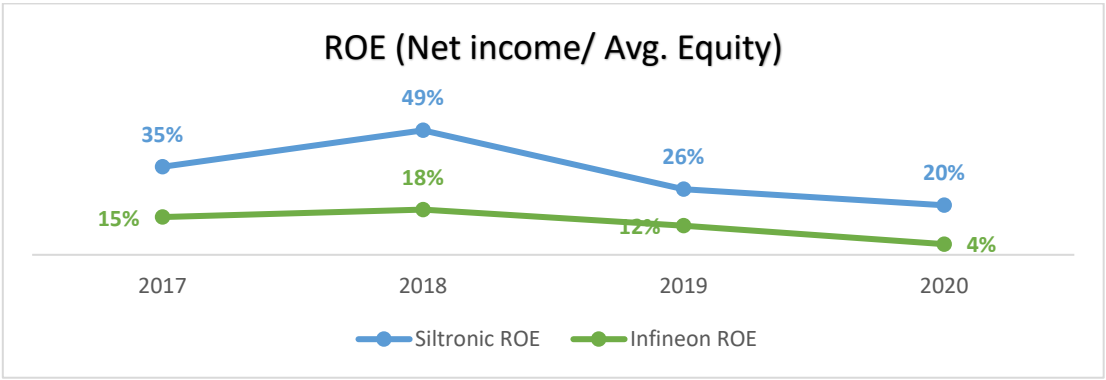

Figure 30. Source: Own elaboration based on the data from the companies' Annual reports

Siltronic presents significant higher results of this ratio; however, both companies have been decreasing ROE from 2018. Siltronic presents a better performance in both, ROA and ROE; this means that the company is capable of generating higher returns with both, assets and net assets or equity.

5.3.3. ROCE (Return on Capital Employed)

To conclude with the return ratios, we are going to analyze ROCE because it is very convenient for the study of capital-intensive firms. This ratio, unlike ROE, measures profitability comparing it with debt and equity. For companies with relevant volumes of debt, the computation of this ratio leads to the neutralization of the financial performance. What ROCE indicates us, is the amount of EBIT that a company is creating with Eur 1 of capital employed.

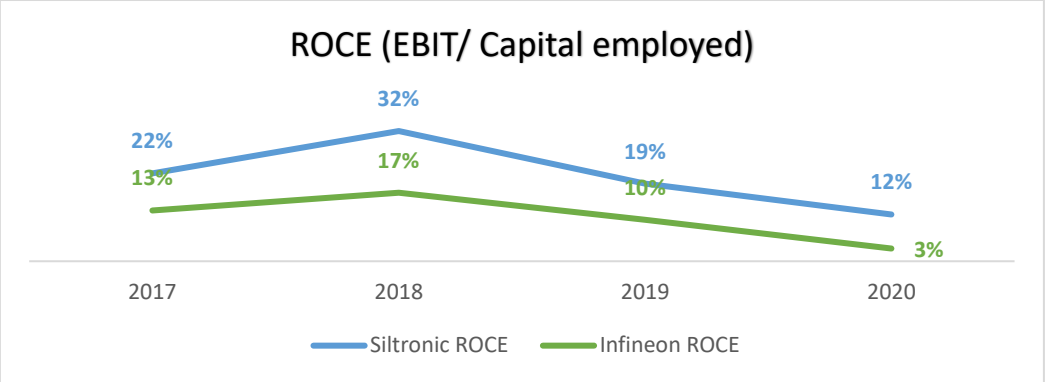

Figure 31. Source: Own elaboration based on the data from the companies' Annual reports

Again, Siltronic shows more profitable and attractive results from this ratio. Nonetheless, this ratio is an indicator of performance and both companies have experienced considerable decreases of this ratio from 2018, which is not positive for them.

5.4. PROFITABILITY

In the Section 4 of this paper, we have already reviewed and explained the profitability of the gross margin, in the analysis of the companies' Profit or loss statement. In this section, we are going to analyze three ratios which also show up from the income statement, and are very important for the profitability of a firm: EBITDA, EBIT and margin ratio.

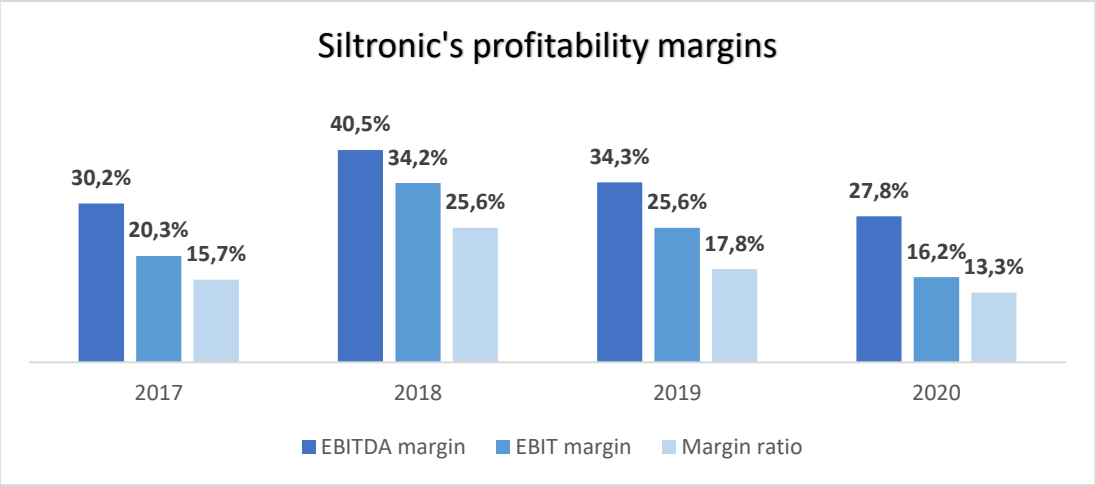

Figure 32. Source: Own elaboration based on the data from Siltronic's Annual reports

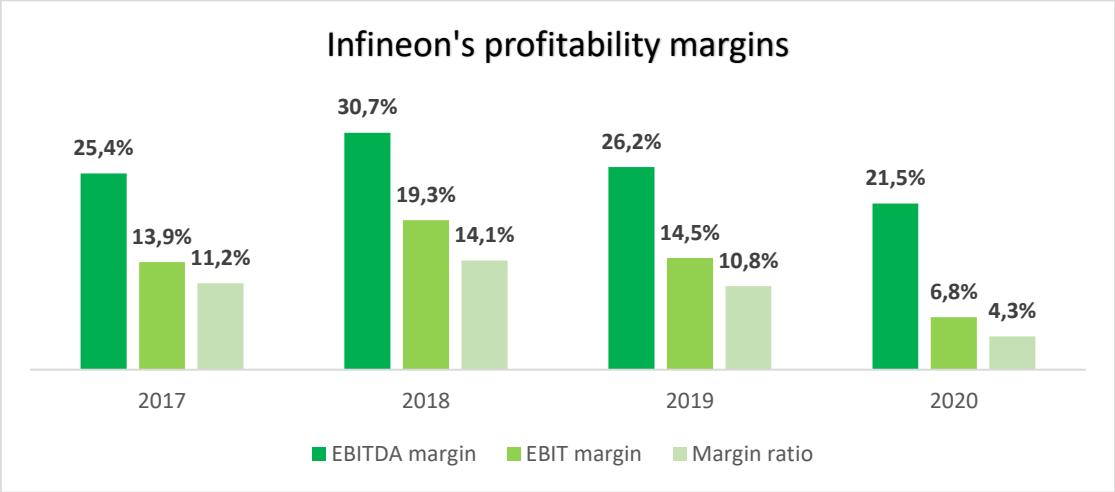

Figure 33. Source: Own elaboration based on the data from Infineon's Annual reports

5.4.1. EBITDA margin

This ratio evaluates the operating profit of a company, in comparison with its revenues. EBITDA refers to Earnings Before Income Taxes Depreciation and Amortization, and gives us information about the operations of a company.

5.4.2. EBIT margin

EBIT margin ratio assesses a company's capability to make a dollar of sales, once all the variable costs of production before incomes and taxes, are paid.

5.4.3. Margin ratio, NI margin or Profit margin

The margin ratio gives us information about the degree to which a company creates profits from total revenues.

5.4.4. Comparison of both companies

Siltronic presents higher results of these ratios, which is a sign of profitability. In general, Siltronic is capable of achieving higher EBITDA/EBIT and NI from the same number of sales or revenues. Both companies, present relatively constant margins; which experienced a decrease in 2020 due to the pandemic.

5.5. BALANCE SHEET STRUCTURE AND OTHER RELEVANT INFORMATION

5.5.1. Assets turnover

This ratio assesses the number of revenues in comparison with assets. It can determine the efficiency of a company creating sales using its assets. The company will prove to be more efficient, the higher this ratio is.

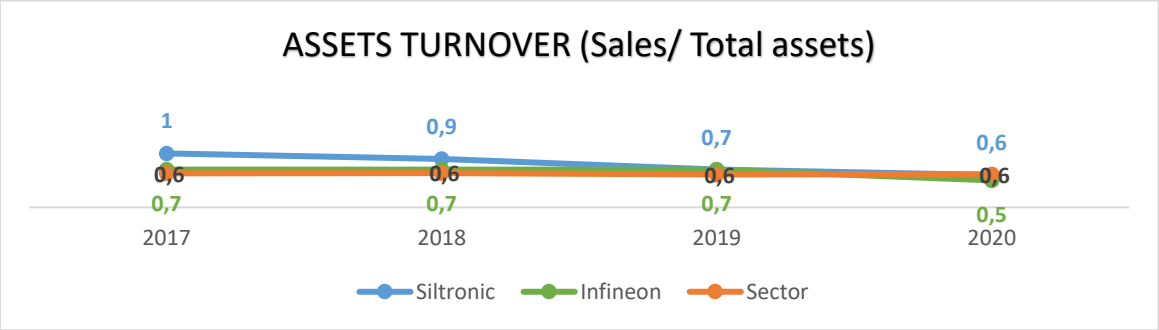

Figure 34. Source: Own elaboration based on the data from the companies' Annual reports

In 2017 the asset turnover was 1 for Siltronic, which means that the company was able to create sales from every euro invested in total assets. Both companies present similar results to the industry, but Siltronic is more profitable. However, both companies have slightly declined this asset during the period despite the increase of their sales; since their assets have been growing quicker and the companies are yet, not able to convert this increase if assets into revenues (in the case of Siltronic, this ratio has declined from 1 in 2017, to 0.6 in 2020).

5.5.2. CAPEX and Free cash flow (FCF)

Since the two companies operate in a sector which is highly intensive in capital, it is interesting to analyze the Capital Expenditure of both companies. Also, FCF is a very important in corporate finance since measures the capability to create cash flow, creating value for shareholders.

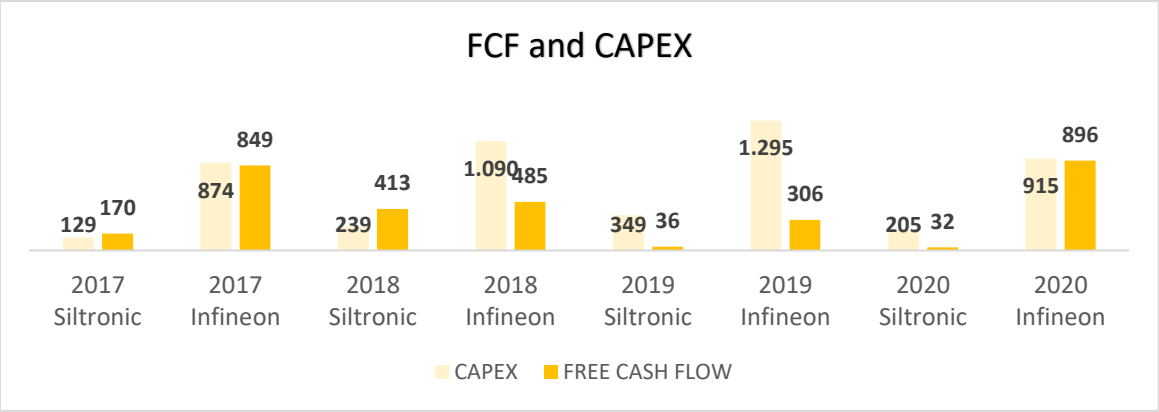

Figure 35. Source: Own elaboration based on the data from the companies' Annual reports

CAPEX or capital expenditures are funds used by a company for the acquisition, maintenance or improvement of capital assets, like, PPE.

Free cash flow shows the amount of cash that is being generated by a company after cash flows that are needed for their operations and the maintenance of their capital assets. It disregards non-cash expenses in the Profit or loss statement, but takes into consideration the money spent in equipment and other assets. Therefore, it is considered to reconcile net income with the mentioned adjustments.

5.5.2.1. CAPEX/SALES

In order to compare CAPEX between the two companies, we are going to analyze this ratio which relates CAPEX and total amount of sales.

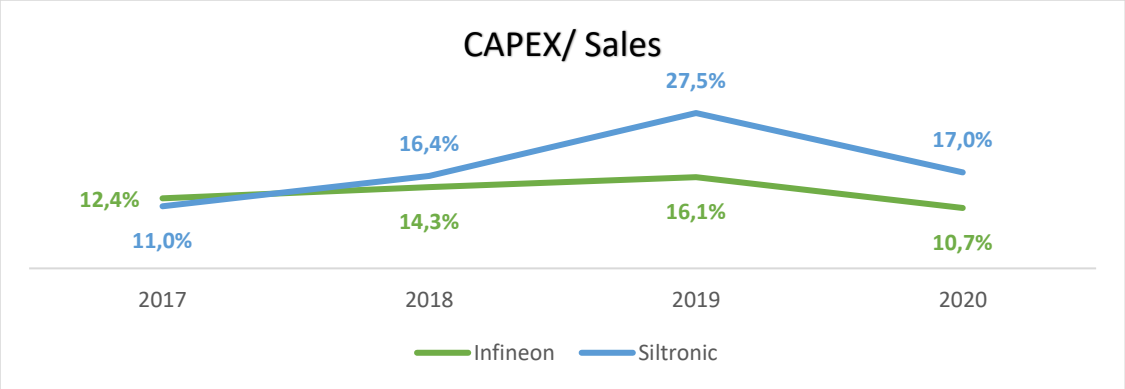

Figure 36. Source: Own elaboration based on the data from the companies' Annual reports

According to this ratio, both companies prove to be very capital-intensive; since they present a result for this ratio which is above 10%. Companies under the semiconductor industry present high CAPEX, since they need it in order to be competitive; until the company has enough size to benefit from economies of scale and operating leverage.

5.5.3. COMPARISON OF DEPRETIATION AND CAPEX

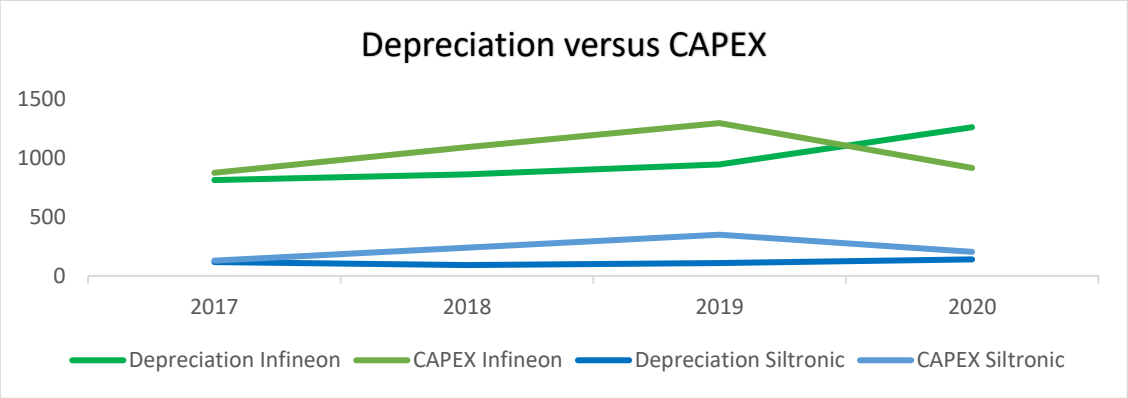

Figure 37. Source: Own elaboration based on the data from the companies' Annual reports

When the company realizes a capital expenditure, it is reflected in the balance sheet; over time, it is transferred to the income statement as a depreciation expense. Therefore, over the total life of an asset, total depreciation must equal its net CAPEX. Both companies present depreciation expenses above CAPEX; which means that they are diminishing their assets. This could be a positive indicator, because they consider to be growing or present strong growth outlook, and will benefit from economies of scale and decide to slightly decrease their assets. However, this comparison should be taken into consideration with several other factors.

5.6. MARKET RATIOS

5.6.1. Earnings per Share (EPS)

The computation of this ratio considers the net income of a firm and divides it by the number of outstanding shares, and expresses its profitability.

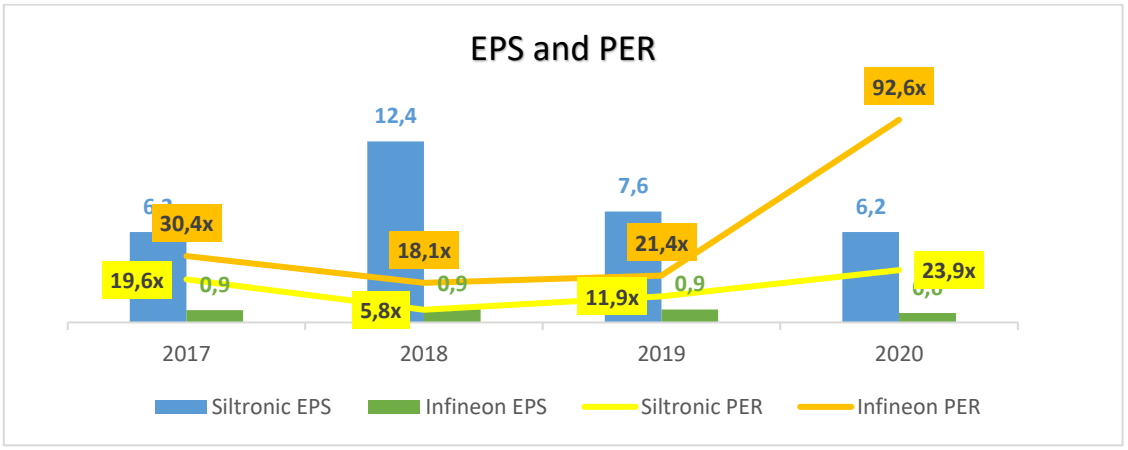

Figure 38. Source: Own elaboration based on the data from the companies' Annual reports

Siltronic presents a higher result of this ratio, therefore it is making more money for every share which is very attractive for the investor. The higher this ratio is, the more an investor will be willing to pay for a share. Siltronic closed the 4th of December with a stock price of over Eur 140; whereas, Infineon's price was Eur 40.

In this sense, it is also interesting to consider the Price-to-Earning ratio (PER), which is computed dividing the market price of the share by the EPS ratio. In this case, Infineon is better valued by the investors; and, the high growth of this ratio from 2019 to 2020, shows the trust of the market in the company's outlook and performance.

5.6.2. Price-to-Book Value

This ratio compares the book value of a company with its market capitalization (number of shares*price per share). This ratio is higher than 1 if the market value of a company exceeds its book value.

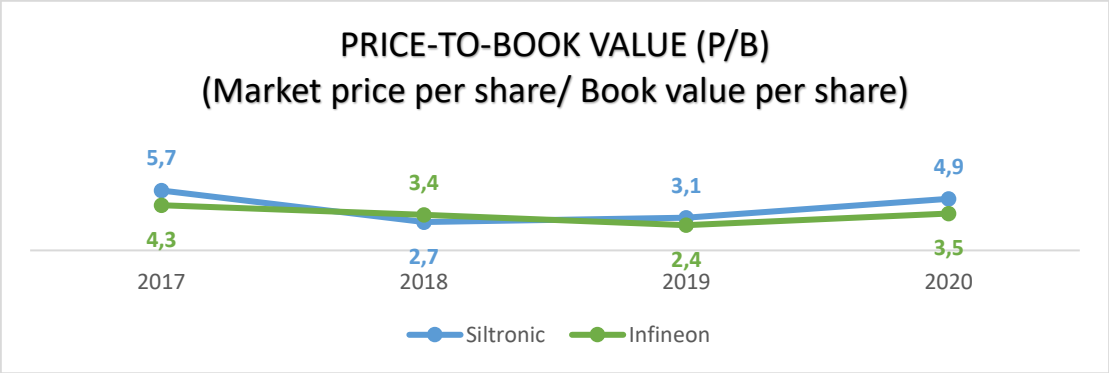

Figure 39. Source: Own elaboration based on the data from the companies' Annual reports

In this case, both companies have grown its P/B ratio from 2019; which means that markets have a positive overview of the company and its performance. Siltronic presented in 2019 and 2020 higher results in this ratio.

6. CONCLUSIONS

6.1. CONCLUSIONS ABOUT SILTRONIC

6.1.1. Assets

The company has grown its assets during the period over 53%, from MEur 1,525 in 2017 to MEur 1,919 in 2020. Non-current assets take a special consideration in this increase, since they have rose from MEur 547 in 2017 to MEur 1,095 in 2020. The company has

been consistently investing in PPE year after year. This show Siltronic's intention to improve the quality of its products in order to win market share.

6.1.2. Equity

The company's equity has increase over 32% during the period, from MEur 638 in 2017 to MEur 872 in 2020. Siltronic has maintained constant levels of share capital and reserves; therefore, the growth comes with the increase of retained earnings over the period. This account started 2017 with a negative balance of MEur -455, which was compensated with a strong increase of NI in 2018. During the period, the company has presented positive net income results, therefore, Equity has increased; however, the company was unable to maintain constant growth rate of its profits.

6.1.3. Liabilities

Siltronic's liabilities have also increased considerably during the period; from MEur 615 in 2017 to MEur 1,048 in 2020. In fact, as we can observe in the following graph, the increase of the firm's total liabilities presents similar growth rates of total assets:

	2018	2019	2020
Total assets growth rate	45%	7%	-1%
Total liabilities growth rate	47%	11%	3%

Table 16. Source: Own elaboration based on data extracted from the Siltronic's Balance sheet statement

This shows that the company has been increasing its debt over the period, in order to finance the growth of assets.

6.1.4. Profit or Loss Statement

From the analysis of this statement, we can conclude that the company does not present a constant performance of its revenues; which, first in crease over 20% in 2018, but decrease 10% and 5% in 2019 and 2020, respectively.

Then, Siltronic's gross margins are over 30%. This margin considerably increased in 2018, due to the growth of revenues, since the company was able to increase the utilization of its capacity, which was very positive for its profitability.

The company's NI was more than doubled in 2018, but after that, experienced considerable decrease, of over 30% year after year, in 2019 and 2020.

From my viewpoint, 2018 was a very good year for the firm, since Siltronic was able to grow revenues; and it had positive impact over profits. However, this growth was not consistent. In 2020, coronavirus pandemic had a positive effect on the number of wafers sold; but this did not become an increase of total revenues, due to price pressures and the negative impact over the product mix.

6.2. CONCLUSIONS ABOUT INFINEON

6.2.1. Assets

The company has increased its total assets, from MEur 4,871 in 2017 to MEur 7,179 in 2020. During 2018 and 2019, growth rate of the company's assets was constant. In 2020, Infineon acquired Cypress which led to a significant growth of the total assets.

Infineon considers that operates in a sector with great potential, which explains its efforts over inorganic growth. If the management of the company over the following years is efficient, return ratios can increase after the acquisition.

6.2.2. Equity

From the equity performance of the company, we can highlight that Infineon has increased its share capital, with the aim of financing the acquisition of Cypress.

Retained earnings have been growing over the period. This account started the period with a negative balance of MEur 1,404 due to losses in previous periods, but in 2020 retained earnings amounted MEur 435.

6.2.3. Liabilities

Again, the liabilities performance presented consistent growth rates in 2018 and 2019; and experienced a very significant increase in 2020, due to Cypress acquisition.

As we saw, the company issued different types of debt (with financial institutions, and bons), in order to obtain several sources of financing.

6.2.4. Profit or loss statement

To conclude with the analysis of the company, we studied the profit and loss statement. We could observe how revenues presented consistent growth rate, over 6%; and, increased from MEur 7,063 in 2017, to MEur 8,567 in 2020.

Gross margin also was relatively stable, around 30-35% over the period; but it was lower in 2020. However, EBIT's growth rate was not constant. This is because, Infineon is a very capital-intensive company, and needs to invest in R&D year after year. The increase of these expenses, was higher than the gross income growth rate; therefore, it had a negative income in the EBIT of the company, and thus, in the NI. Net income decreased from MEur 791 in 2017 to MEur 372 in 2020.

Infineon is a leading company in the automotive sector, so the profitability of the company decreased in 2020, as a consequence of the pandemic (in fact, we could see how in 2020, automotive revenues maintained its levels; but, suffered a significant decline of its margins). Infineon has different segments, but over 40% of its revenues come from semiconductors for vehicles. As the company has reported, the number of semiconductors per vehicle is growing, and expected to increase during the following years; therefore, the company has a positive outlook.

6.3. CONCLUSIONS ABOUT THEIR FINANCIAL RATIOS

In order to compare both companies, we studied their performance taking into consideration different ratios which we have organized, according to the type of information they provide us about the company.

Both companies' liquidity ratios were aligned with the average of the industry. Siltronic had more liquidity, but both companies prove ability to face their current liabilities; and do not seem to present inefficient management of current assets, because the results are in line with the sector. Current ratio is every year, over 2; this means that current debt is covered with the current assets of the companies.

However, Siltronic and Infineon present some differences, when we refer to solvency ratios. Siltronic's debt-to-equity ratio is a lot higher (average above 100% during the period, versus 80% of Infineon). In this sense, Siltronic is riskier for shareholders; since it finances its operations with larger amount of debt, which generates interests and risk of being uncapable to face non-current obligations. On the other hand, debt-to-capital result is more similar between the firms, over 50%. The performance of the companies in this ratio is constant over time.

In order to measure the return of their resources, we have analyzed the following ratios: ROA, ROE and ROCE. Siltronic presents higher return rates; which means that is more efficient converting its assets, equity and capital employed into profits.

From 2017 to 2020, average ROA for Infineon was 6.9, and for Siltronic 15 (more than doubled Infineon's result). Average ROE for Infineon was 12, and for Siltronic 32. Then, average ROCE for Infineon was 10 versus, 21, for Siltronic.

Siltronic's ROA ratio has presented variations over the period; whereas Infineon's performance was more constant. However, Infineon experiences a significant decline of ROA in 2020 due to two relevant factors which occurred this year. On the one hand, Infineon increased its assets with the purchase of Cypress; and, due to the pandemic, the automotive section reduced its profitability. Therefore, Infineon needs to focus on the management of its assets in order to improve the results of this ratio.

As we have seen, ROE is also considered as the return in net assets; and again, Siltronic's performance is better regarding the management of its own resources, or equity. It is able to create more profit over the same amount of equity than Infineon. However, both companies have been decreasing this ratio from 2018, which means that they are generating lower returns with their equity.

ROCE is a very significant return ratio for capital intensive companies; and thus, for the semiconductor sector. As it happened with ROE, Siltronic's return over capital employed is higher and presents attractive ratio results; however, Infineon and Siltronic have declined this ratio significantly from 2018.

In order to measure the profitability of the companies over their Income statements, we analyzed their EBITDA, EBIT and Profit margins. Siltronic is more profitable since it is able to acquire higher NI from the same number of total sales. For example, EBITDA margin over the period, for Siltronic was around 30-40%; whereas, Infineon's EBITDA margin was between 25-30%. Profit margin was over 15% for Siltronic (and achieved a 25% in 2018); but, around 10-15% for Infineon (this company experienced a significant decline of margin ratio in 2020, due to the pandemic, which was only 4%, compared to a 10% in 2019).

In general, it is remarkable the low levels of profitability presented by Infineon, in comparison with Siltronic and the industry; however, it has slightly improved during the past years.

Both companies present significant CAPEX; Infineon a total of MEur 4,174 over the 4 years period, and Siltronic MEur 922. In order to compare this information, we have considered the CAPEX/ Sales ratio which is higher fir Siltronic (average during the period of 18%, versus 13% for Infineon). I do not consider it is a very positive to present higher results in this margin; since semiconductor companies need to invest in CAPEX in order to remain competitive; therefore, Siltronic is giving up a greater amount if their total sales to invest them into CAPEX. Since Infineon is a bigger company, CAPEX represents lower part of their revenues during the period.

To conclude with the comparison of the companies; we analyzed some market ratios; in order to understand how investors value their performance. Price-to-book value ratio is higher than 1 for both companies; which means that market value of the company is above its book value. They both present constant and similar results of this ratio over the period, Infineon average P/B ratio during these four years was 3.4, and Siltronic, 4.2.

According to PER, Infineon is better valued by the investors than Siltronic. From 2017 to 2019, the average PER for Infineon was 23.3, whereas, for Siltronic, 12.4. I consider that Infineon's product portfolio is more interesting, because their semiconductors create more value than Siltronic's wafers. In 2020, both companies experienced a great increase of PER ratio: Infineon, from 21.4 to 92.6 and, Siltronic, from 11.9 to 23.9. The market has a positive perspective about the future of the sector.

It is very significant what happened with Infineon in 2020; PER ratio reached 92. I consider that investors have shown trust over the management of the company over the pandemic; and are optimistic about the acquisition of Cypress. In addition, from my point of view segments where this company commercialized their semiconductors (vehicles, energy or security) present very positive growth perspective.

7. BIBLIOGRAPHY

Siltronic Annual report 2017. https://www.siltronic.com/fileadmin/investorrelations/2017/Quartal4/Siltronic_Annual_Report_2017.pdf

Siltronic Annual report 2018. https://www.siltronic.com/fileadmin/investorrelations/2018/Quartal4/05.03.Siltronic_Annual_Report_2018_open.pdf

Siltronic Annual report 2019. https://www.siltronic.com/fileadmin/investorrelations/2019/Quartal4/Siltronic_Annual_Report_2019_safe.pdf

Siltronic Annual report 2020. https://www.siltronic.com/fileadmin/investorrelations/2021/Quartal1/05.03.Siltronic_Annual_Report_2020_open.pdf

Infineon Annual report 2017. https://www.infineon.com/dgdl/Infineon+Annual+Report+2017.pdf?fileId=5546d4615fe36363015fea7bc7620023

Infineon Annual report 2018. https://www.infineon.com/dgdl/Infineon+Annual+Report+2018.pdf?fileId=5546d461673c11be01673d9d98e40014

Infineon Annual report 2019. https://www.infineon.com/dgdl/Infineon+Annual+Report+2019.pdf?fileId=5546d4616e8d476e016e9958480f0029

Infineon Annual report 2020. https://www.infineon.com/dgdl/Infineon+Annual+Report+2020.pdf?fileId=5546d46175b876680175e6dd0540001e

Global semiconductor, the microcontroller war, Exane BNP Paribas, July 2020 (Unpublished)

Global semiconductor, Exane BNP Paribas, September 2021 (Unpublished)

Global semiconductor, Exane BNP Paribas, July 2020 (Unpublished)

Infineon, Goldman Sachs Equity Research, November 2021 (Unpublished)

Siltronic, Jefferies Equity Research, September 2020 (Unpublished)

8. INDEX OF GRAPHS AND TABLES

8.1. FIGURES

8.2. TABLES