

# QUALITATIVE AND QUANTITATIVE ANALYSIS OF SIEMENS AG

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# SIEMENS

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SIEMENS AG BASIC INFORMATION

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# 1. Introduction:

**Siemens AG** is a German multinational engineering and electronics conglomerate company headquartered in Munich, Germany. It is the largest based in Europe.

Founded to manufacture and install telegraphic systems, Germany-based Siemens AG has prospered and grown over 165 years to become a multifaceted electronics and electrical engineering enterprise, and one of the most international corporations in the world.

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The Siemens name has been synonymous with cutting-edge technologies and continuous growth in profitability. With their wide array of products, systems and services, they are world leaders in information and communications, automation and control, power, medical solutions, transportation and lighting. Sustainable success is their number one priority. Have presence in more than 190 countries and 750 subsidiaries and associated companies all over the world.

Siemens operate in the fields of industry, energy and healthcare as well as providing infrastructure solutions.

Their activities focus on meeting the needs of their customers and creating value for their shareholders and employees. Their innovations--generated in their own laboratories and in cooperation with customers, business partners and universities--are their greatest strength. Siemens' global network of innovation is developing new products and services for a world that--while limited in resources--is boundless in possibilities.

## 2. Company History:

### Company Origins in Telegraph Systems: 1847-76

**1847. Siemens & Halske** was founded in Berlin by Werner Siemens and J.G. Halske to manufacture and install telegraphic systems.

### Expansion and Diversification: 1877-1929

**1877. Alexander Graham Bell's new telephones** reached Berlin for the first time. Werner Siemens quickly patented an improved version of the device and began production. In the next decade, Siemens & Halske also developed and began manufacturing electrical lighting and power generating equipment.

**1892.** Siemens & Halske build a power station at Erding in Bavaria and establish an **American subsidiary**, Siemens & Halske Electric Company, in Chicago.

**1895.** Wilhelm Conrad Roentgen discovered the **X-ray**, and Siemens & Halske owned the first patent for an X-ray tube.

**1897.** Siemens & Halske decided to **go public** and reorganized with Carl Heinrich.

**1903.** It established Siemens Schuckertwerke GmbH, a subsidiary devoted to electric power engineering.

**1909.** Siemens & Halske developed an automatic telephone exchange serving 2,500 customers in Munich.

But when **World War I** broke out, orders for civilian electrical equipment slowed considerably and the company began production of communications devices for the military.

**1923.** It started producing radio receivers for the consumer market. In the same year, recognizing the growing importance of Japan as an industrial power and set up a Tokyo subsidiary, Fusi Denk, later known as Fuji Electric.

**1925.** Siemens began construction of a power station on the Shannon River in Ireland, and in 1927 the company began work on another hydroelectric power station for the Soviet government. Back home in Germany, financed and produced a railway network in suburban Berlin.

By the end of the decade, the company was accounting for one-third of the German electrical manufacturing industry's production and nearly the same proportion of its employees.

## **The Company During Wartime: 1930-45**

**1930s.** Siemens & Halske was bloodied by the **Great Depression**, but it survived. It was forced to halve its dividend in the early 1930s and lay off employees, but remained on relatively sound financial footing until the Nazi government's rearmament project helped revive its fortunes in 1935 (manufactured a wide range of equipment for all of Germany's armed services).

**1945.** After the Soviet army conquered Berlin, Russian occupation authorities completely dismantled the Siemensstadt factory works and corporate headquarters.

### **Rebuilding and Reorganization Through the 1950s and 1960s**

The company had been devastated by the war and required years of rebuilding to **get back on its feet**.

**1949.** Its corporate headquarters was relocated to Munich

**1950.** Siemens & Halske was once again producing railroad, medical, telephone, and power generating equipment, as well as consumer electronics products.

**1954.** It established an American subsidiary in New York, Siemens Inc.

**1955.** Siemens & Halske entered the burgeoning fields of data processing (mainframe computer) and nuclear power (nuclear reactor).

**1966.** The company underwent a major reorganization bringing all of its subsidiaries directly under control of the parent company and reincorporating as **Siemens A.G.**

## **Prospering in the 1970s**

**1970s.** Were prosperous years for Siemens. Despite a slower worldwide economy that curbed customer orders in some areas and forced the company to cut its workforce.

## **Keeping Pace with High Technology and Globalization in the 1980s and 1990s**

**1980s.** Under Plettner and new CEO Karlheinz Kaske, Siemens embarked on an **expensive and ambitious program** of acquisitions and research and development to try to make itself into a world leader in high technology. Siemens' strategy was designed to pay off over the long term and produced few tangible benefits in the short run.

As the company entered the new decade, globalization became a vital part of its policy--and that meant a readjustment of the company's homogeneous culture. Europe was facing a recession and the Asian and South American markets offered huge opportunities for growth.

The hierarchical structure and engineering focus were replaced for a new emphasis on innovation and service.

**1990s.** Another move toward globalization, an international partnership brought Siemens together with the world's largest computer maker (IBM) and Japan's second largest chip maker (Toshiba Corporation).

## **Radical Restructuring for the 21st Century**

**Mid-1990s. Difficult years** for Siemens. Analysts critiqued Siemens for being too slow to respond to the new demands of the rapidly globalizing business environment.

**1998.** Company head Heinrich von Pierer introduces a **ten-point excellence** plan to increase earnings and crack down on underperforming businesses.

The revamped Siemens consisted of four main divisions: power generation, industry, rail systems, and information and communications.

Information and communications was Siemens' biggest division. Here, the company hoped to forge partnerships in its mobile phones and personal computers businesses, both areas in which it lacked sufficient market share to compete effectively on its own.

Still, the company focuses on IT & Communications and Industry. Von Pierer was particularly intent on restoring profitability to the three IT-related divisions of telecom equipment, mobile phones, and business services.

**2001.** Siemens makes its first listing on the New York Stock Exchange.



**2003.** Siemens acquired the flow division of Danfoss and incorporated it into the Automation and Drives division.

**2004.** The wind energy company Bonus Energy in Brande, Denmark was acquired, forming Siemens Wind Power division.

**2005.** Siemens sold the Siemens mobile manufacturing business to BenQ, forming the BenQ-Siemens division.

**2006.** Siemens announced the purchase of Bayer Diagnostics, which was incorporated into the Medical Solutions Diagnostics.

**2007.** The Fixed Networks, Mobile Networks and Carrier Services divisions of Siemens merged with Nokia's Network Business Group in a 50/50 joint venture, creating a fixed and mobile network company called Nokia Siemens Networks.

**2008.** Siemens AG announced a joint venture of the Enterprise Communications business with the Gores Group.

**2009.** Siemens announced to sell its 34% stake in Framatome. In March, it announced to form an alliance with Rosatom of Russia to engage in nuclear-power activities. In April 2009, Fujitsu Siemens Computers became Fujitsu Technology Solutions as a result of Fujitsu buying out Siemens' share of the company. In October 2009, Siemens signed a \$418-million contract to buy Solel Solar Systems an Israeli company in the solar thermal power business.

**2010.** Siemens agreed to sell its IT Solutions and Services subsidiary for €850 million to Atos.

**2011.** Siemens announced that it would exit the nuclear sector.

## **3. Vision, Mission and Strategy:**

### **3.1. Vision:**

Siemens vision is to be a pioneer- this is their vision, their identity and their main defining characteristic. The vision is based on their values – responsible, excellent and innovative –, which provide the foundation for their success. Being a pioneer in each sector they operate:

- Energy efficiency
- Industrial productivity
- Affordable and personalized
- Intelligent infrastructure solutions

### **3.2. Mission:**

On the basis of its forward-looking technology and solutions, the mission of Siemens is to produce a wide range of products and solutions designed with the environment and engage with climate change.

### 3.3. Strategy:

The company strategy shows how to make its vision a reality. Siemens is aiming to capture and maintain leading market and technology positions in all its business in order to achieve sustainable profitable growth and, thus, continually increase its company value. For this reason its strategy is reflected in three different directions:

- Innovation-driven growth markets: The company is breaking new ground while focusing on growth markets. Its activities are closely geared to innovation-driven markets with long-term potential and they intend to play a leading role in these markets. To reach this goal, Siemens is continuously strengthening its offerings and further expanding its environmental portfolio.
- Get closer to its consumers: they want to be close to their markets, our partners and our customers. For these reason another strategic aim that they are pursuing is the professionalization and expansion of their service portfolio. They are opening up a large number of new business opportunities and reinforcing customer retention. Moreover, to better understand what really helps their customers, Siemens is constantly intensifying its already wide-ranging interaction with them.
- Use the power of Siemens, "One Siemens": To rank among the best, it is important to excel in everything to do, and that means you need an outstanding team. Because of this, their last commitment is their employees' integrity. The One Siemens strategy is based on the idea of each employee contribute to the company success with his knowledge, his compromise and his pioneer spirit. In addition, Siemens always operate under the name of Siemens; they only use one brand for all their business as their objective is to transmit confidence and innovation through all their products.

## 4. Company Structure:

### 4.1. Board of directors

The German corporation law requires all the public companies to divide the board of directors into two-tiers: a Management Board (called "Vorstand") which is solely responsible of the management of the company, and a Supervisory Board (called "Aufichatsrat"), which is in charge of overseeing the activity of the management board. The aim of this two-tiered system is to make the German Corporate Governance system more transparent and understandable.

On one hand, we have the Management board, which is composed of 10 members. The president and CEO of Siemens AG is Peter Löscher, therefore we can conclude that the Management Board is not simply a control element, actually the Vorstand has a real decision-making power. The other members of Vorstand are

Klaus Helmrich	Brigitte Ederer
Peter Y. Solmssen	Dr. Siegfried Russwurm
Joe Kaeser	Dr. Roalnd Busch
Dr. Michael Suess	Barbara Kux
	Dr. Hermann Requardt

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On the other hand, the Supervisory Board of Siemens AG has 20 members. As stipulated by the German law, half of the members represent the company shareholders and half represent the company employees. The shareholder representatives were elected at the Annual Shareholders' Meeting on this January and the employee representatives were chosen for last time on 2012.

The present members of the Supervisory board are:

<b>Shareholder representatives</b>	<b>Employee representative</b>
<b>Dr. Gerhard Cromme</b> <i>Chairman of the Supervisory Board of Siemens and ThyssenKrupp AG</i> <i>Since 1/23/2003</i>	<b>Berhold Huber</b> <i>First chairman, IG Metall</i> <i>7/1/2004</i>
<b>Dr. Josef Ackermann</b> <i>Second Deputy Chairman</i> <i>Chairman of the Board of directors of Zurich Insurance Group AG</i> <i>Since 1/23/2003</i>	<b>Lothan Adler</b> <i>Chairman of the Central Works Council of Siemens AG</i> <i>1/23/2003</i>

**Gerd von Brandenstein**

*Member of the Supervisory Board of degewo AG*

*Since 1/24/2008*

**Michael Diekmann**

*Chairman of the Board of the management of Allianz SE*

*1/24/2008*

**Dr. Hans Michael Gaul**

*Chairman of the Audit Committee of Siemens AG*

*1/24/2008*

**Dr. Peter Gruss**

*President of the Max Plank Society*

*1/24/2008*

**Dr. Nicola Leibinger – Kammüller**

*TRUMPF GmbH + Co. KG*

*1/24/2008*

**Gérard Mestrallet**

*President and CEO of GDF SUEZ SA*

*1/23/2013*

**Güler Sabanci**

*Chairwoman and managing director of Haci Ömer Sancı Holding SA*

*1/23/2013*

**Werner Wenning**

*Chairman of the supervisory boards of Bayer AG and E.ON SE*

*1/23/2013*

**Bettina Haller**

*Chairwoman of the Combine Works Council, Siemens AG*

*4/1/2007*

**Hans-Jügen Hartung**

*Chairman of the Works Council, Siemens Energy Sector*

*1/27/2009*

**Robert Kensbock**

*Member of the Central Works Council of Siemens AG*

*1/23/2003*

**Harald Hern**

*Chairman of the Siemens Europe Committee*

*1/24/2008*

**Jüger Kerner**

*Executive managing board member of IG Metall*

*1/25/20012*

**Dr. Rainer Sieg**

*Chairman of the committee of Spokespersons, Siemens Group*

*Chairman of the central committee of Spokespersons, Siemens AG*

*1/24/2008*

**Brigit Steinborn**

*Deputy Chairwoman of the Central Works Council, Siemens AG*

*1/24/2008*

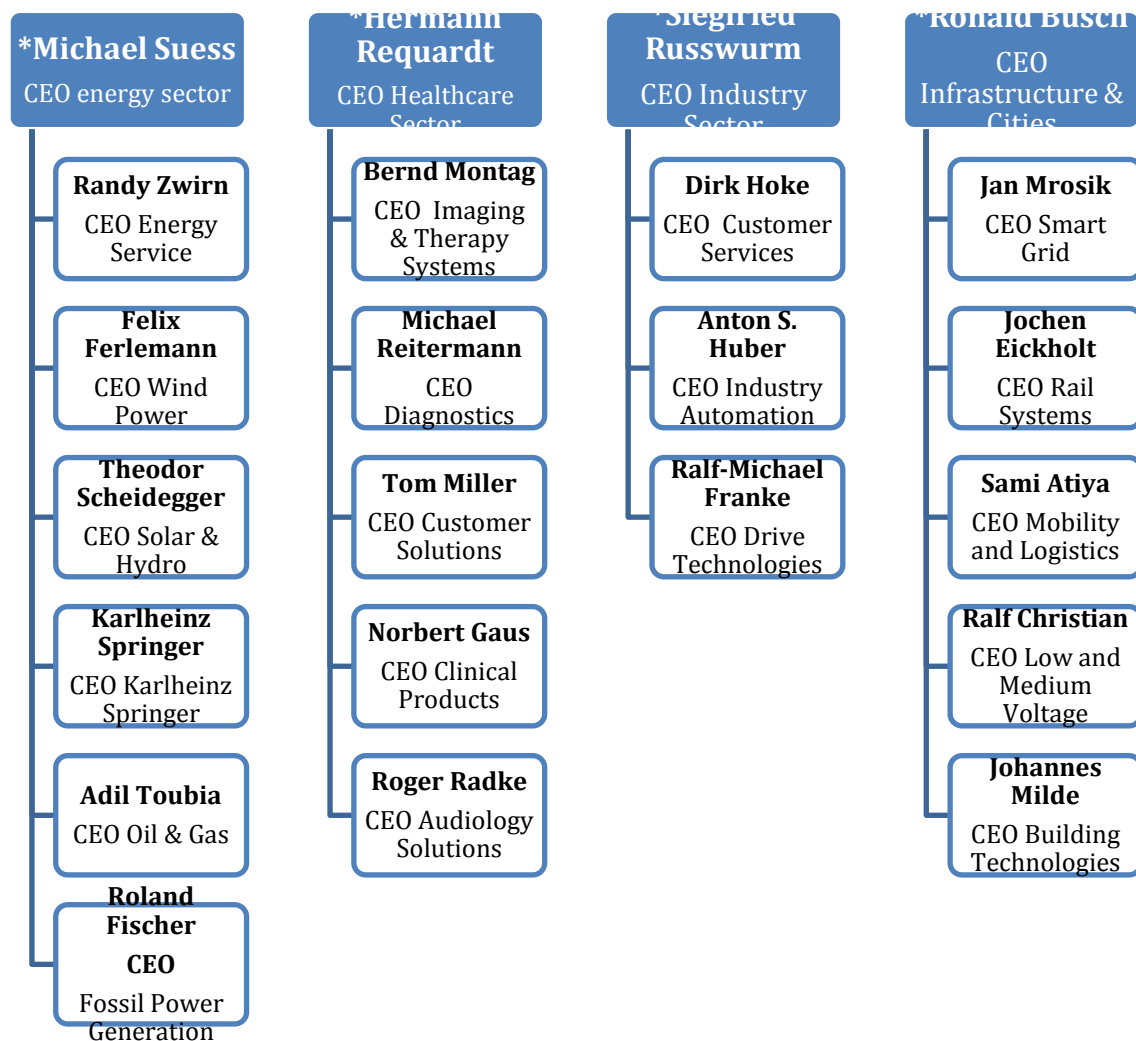
**Sibylle Wankel**

*Attorney, Bavarian Regional Headquarters, IG Metall*

*4/1/2009*

## 4.2. Management by sector

After mentioning the people that form the board of directors, we continue citing the principal people that is in charge of each sector. To facilitate its understanding, we have provided their names in an organization chard:



## 5. Company Sectors:

Siemens' principal activities are in the fields of industry, energy, transportation and healthcare. The company is organized into five main divisions: Industry, Energy, Healthcare, Infrastructure & Cities, and Siemens Financial Services (SFS). The Energy division is in charge of generating, transmitting and distributing electrical power at the highest levels of efficiency. The company works directly producing energy and moreover it also works indirectly in this field manufacturing

power, transmission systems, compressors and turbines.

Otherwise the company is also socially responsible as it produces, always with the latest technology, farms of all kind of renewable energies (solar, wind, biomass and hydro energy). But its responsibility with the word does not end here. Siemens also has a great concern about medicine and tries to advance in this field by leaps and bounds. The company invests large amounts of money in investigating many different medicine camps and has developed one of the most important medical instruments of nowadays.

As one of his values is to be innovative; Siemens is working in new solutions for energy, industry, infrastructure and healthcare. In 2011 Siemens invested approximately €4 billion in research and development. Otherwise R&D is in progress at around 188 Siemens locations worldwide and the company maintains strategic partnerships with leading research institutions. As we see, R&D is one of the most important departments of the company while R&D gives to then a huge competitive advantage above his direct competitors.

## 5.1. Energy

The **Siemens Energy Sector** is the world's leading supplier of products, services and solutions for power generation. Its extensive portfolio comprises highly efficient technologies for thermal power plants, renewables, power transmission, and for the extraction, processing and transport of oil and gas. Siemens is really respectful with the nature and on 2011 their products and solutions trimmed off 317 million of tonnes of Co2, a quantity equal to the total CO2 emissions in Berlin, Delhi, Istanbul, Hong Kong, London, New York, Singapur and Tokio.

## Key figures (FY 2012)

In millions of €

New orders	26,881
Total revenue	27,537
Profit	2,159
Employees	86,000

## 5.2 Industry

The **Siemens Industry Sector** is one of the world's leading suppliers of innovative and eco-friendly products and solutions for industrial customers. With their complete range of automation technologies, intelligent software solutions, vast industry expertise and closely integrated services, they're increasing the productivity, efficiency and flexibility of their customers – while at the same time

strengthening their own competitiveness.

## Key figures (FY 2012)

In millions of €

New orders	19,985
Total revenue	20,508
Profit	2,467
Employees	105,000

### 5.3 Healthcare

The **Siemens Healthcare Sector** is one of the world's largest providers to the healthcare industry and a leader in imaging systems, laboratory diagnostics, healthcare IT, and hearing aids. They offer customers products and solutions for comprehensive patient care from a single source – from prevention and early diagnosis to therapy and aftercare. By optimizing the clinical procedures associated with the most important medical conditions, they help make healthcare faster, better, and more cost-efficient.

## Key figures (FY 2012)

In millions of €

New orders	13,806
Total revenue	13,642
Profit	1,815
Employees	51,000

### 5.4 Infrastructure and Cities

The **Infrastructure & Cities Sector** is the newest sector of the company, it started to operate in October 2011. It offers sustainable technologies for metropolitan centers and urban infrastructures. The portfolio encompasses integrated mobility solutions, building and security systems, power distribution equipment, smart grid applications, and low- and medium-voltage products. This new structure will bring up their clients even more closer and will offer new business opportunities in the growing market of the cities

## Key figures (FY 2012)

In millions of €

New orders	17,150
Total revenue	17,585
Profit	1,102
Employees	89,000

### 5.5. Financial Services

The **Financial Services unit of Siemens (SFS)** is an international provider of business-to-business financial Current key figures of Financial Services solutions. Leveraging their specialist financing and technology expertise in the areas of energy, healthcare, industry, infrastructure and cities, they support customer investments with leasing solutions and equipment, project and structured financing. They provide capital for Siemens customers as well as external companies and serve as an expert advisor for financial risks within Siemens. Their financial and industry know-how creates customer value and enhances customer competitiveness while building trust in new technologies and facilitating their market launch.

### 5.6. Other activities

Despite all these sectors, Siemens has also invested in shares in BSH Bosch and Nokia Siemens Networks.

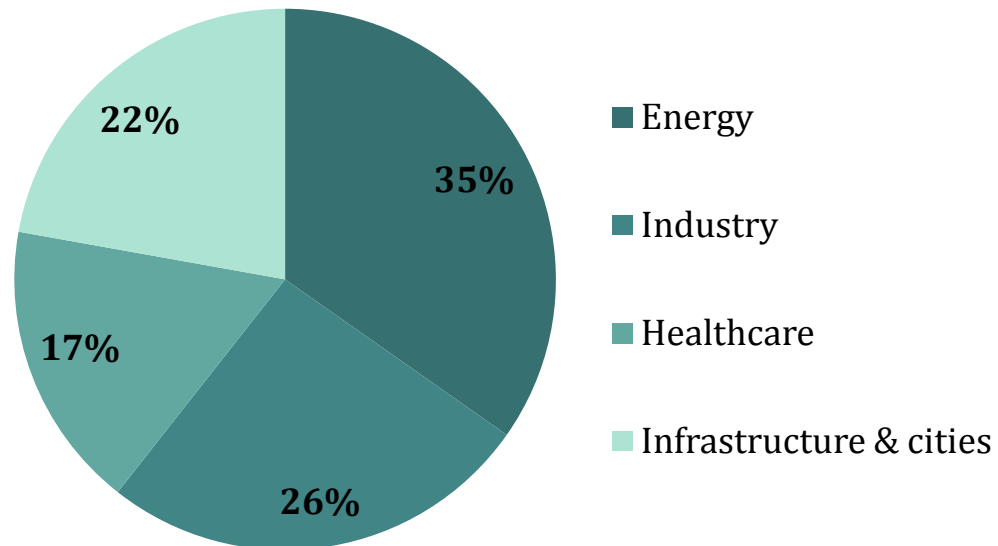
BSH is the largest manufacturer of home appliances in Germany and Europe, and one of the leading companies in this sector. The enterprise brings together the major brands of homecare products: Bosch, Siemens, Gaggenau, Neff, Ufesa and Balay. Furthermore, this company currently has 42 factories and 60 companies scattered throughout the world and it employees around 39,000 people.

On the other hand, Nokia Siemens Networks (NSN) is one of the main companies of telecommunications infrastructure and operates in 150 countries. The company offers a comprehensive portfolio of technologies for mobile, fixed and converged, as well as professional services including consultancy les services, systems integration, installation and maintenance and managed services.



## 5.7. Revenues importance

Total Company revenues from 2012: 78,296M



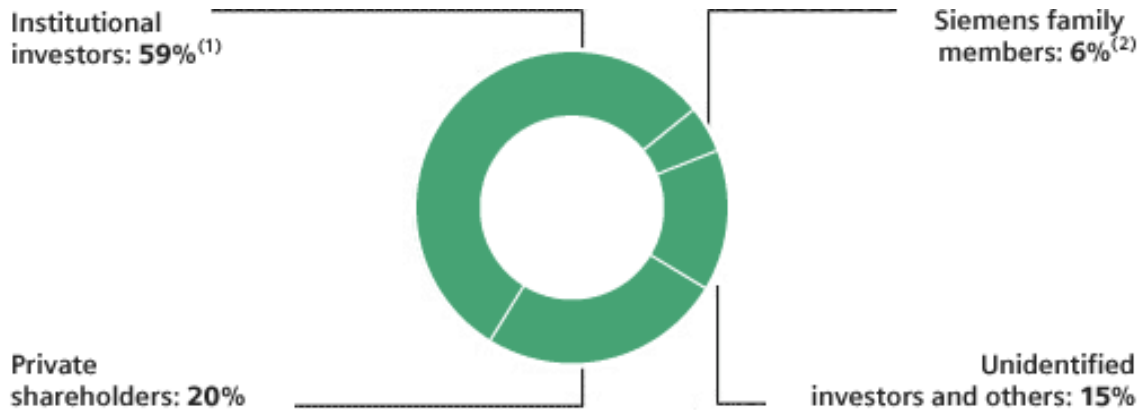
In order to know which is the principal sector and the more important one, we take into account the revenues that each sector had obtain the last year. So as we could see, the sector with more weight into Siemens is the Energy sector with a 35% of the revenues, followed by the Industry sector with a 26% and later having a less weight there are the Healthcare sector and the Infrastructure & cities sector.

Siemens has stood for technological excellence, innovation, quality, reliability and internationality. The company is the world's largest provider of environmental technologies. Around 40 percent of its total revenue stems from green products and solutions. In fiscal 2012, which ended on September 30, 2012, revenue from continuing operations was €78.3 billion and income from continuing operations was €5.2 billion. At the end of September 2012, Siemens had around 370,000 employees worldwide on the basis of continuing operations.

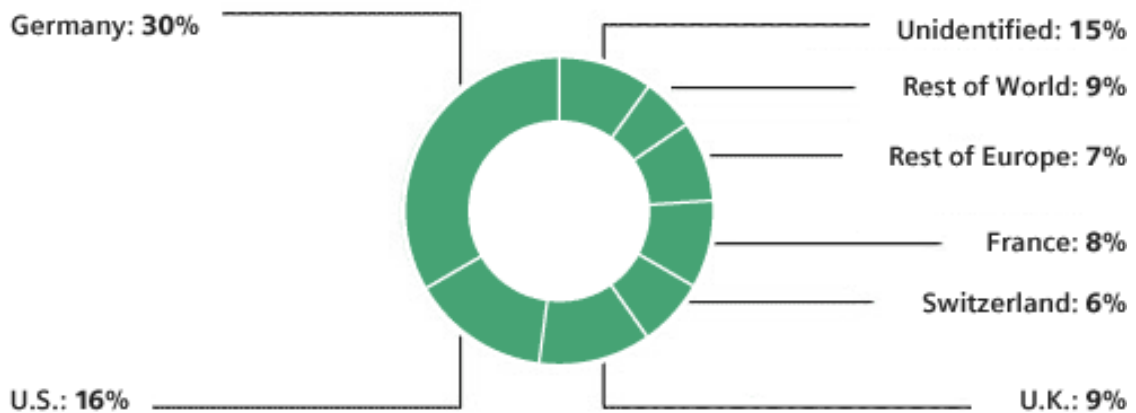
## 6. Shareholders Structure:

(as of September 30, 2012)

### Type of Investor



### Regional structure



With some 740,000 shareholders, Siemens AG is one of the world's largest publicly owned companies. An analysis of their shareholder structure conducted in August 2012 showed that shareholders in Germany hold the largest percentage of their share capital, about 30% of all outstanding shares. Shareholders in the U.S. hold roughly 16% and shareholders in the U.K., around 9%, while investors in France and Switzerland hold 8% and 6%, respectively.

Some 59% of Siemens' outstanding shares are currently held by institutional investors, about 20% by private shareholders and around 6% by members of the Siemens family.

## 7. Stakeholders:

As Siemens operates in so many different sectors and furthermore they are so divergent between them, at first we can conclude that everyone is a stakeholder, because Siemens activities directly and indirectly affect a great amount of people. For example, the communities could be stakeholders as they daily use the metro and the train or they have Siemens electrodomestics. Since this, they take the stakeholders' need for information and their interests very seriously.

But if we want to analyze deeper the stakeholders, we can define the stakeholders as the people who can affect or be affected by the actions of the business as a whole. Those include analysts and investors, their customers, employees and suppliers, as well as public authorities, universities, research institutions and NGOs.

## 8. Competitors:

Siemens AG, as all big international companies, is always fighting to be on the top. As they operate in more than one sector, they have different kinds of competitors depending on the activity's field. We will name only a few of them, the more dangerous that they have.

### **General Electrics Co. (US)**

This is an American multinational conglomerate. GE's divisions include GE Capital, GE Energy, GE Technology Infrastructure, and GE Home & Business Solutions.

Through these businesses, GE participates in a wide variety of markets including the generation, transmission and distribution of electricity (e.g. nuclear, gas and solar), lighting, industrial automation, medical imaging equipment, motors, railway locomotives, aircraft jet engines, and aviation services.

As you could see, this company operates in the same sectors of Siemens, so it is their first competitor in the most part of their business.

The main competitors in the rail manufacturing:

- **Bombardier Inc. (Canada)**
- **Alstom SA. (France)**

Siemens had been competing with this two companies for the manufacturing of the TGV all over the world. While in Europe the competition has been between Alstom and Siemens (both European companies), Bombardier enters in the battle for the manufacturing in others parts of the world.

The main competitor in the energy sector:

- **ABB Ltd.**

ABB and Siemens, the world leaders in latest generation electricity transmission technology, are racing to overcome the biggest remaining challenge to transmitting power more efficiently.

While Siemens has the broader span of products, from trains to medical scanners,

the Swiss company splits its sales fairly evenly between factory automation systems and transmission equipment for electricity.

The Swiss and German groups are pouring millions into research into circuit breakers for high voltage direct current (HVDC) power lines, the most efficient way of transmitting electricity over long distances.

The main competitor in the healthcare sector:

**- Philips Electronics N.V. (Netherlands)**

Philips is much more focused on retail and consumer markets, where Siemens has a much more industrial and wholesale or infrastructural focus. Both offer healthcare solutions, but Siemens' clients are the hospitals, while Philips is more focused on getting hospital solutions to the patient's home.

Also, Philips is competing with Siemens in the lighting sector. Siemens has never had its own lighting division but acquired one, by the time a growing competitor of Philips: Osram.

# **BLOC 2**

## **Risk Analysis**

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# 1. SHARES RISK

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Magnitude	Value
Volatility	18,33%
VaR	1,43%
Beta	0,7
Index's Volatility	19,91%
Index's Var	52,48%
Index's Beta	1

\* Siemens AG values from 8/04/2013

Volatility refers to the amount of uncertainty or risk about the size of changes in a security's value. A higher volatility means that the price of the security can change dramatically over a short time period in either direction. A lower volatility means that its value does not fluctuate dramatically, but changes in value at a steady pace over a period of time. Shows the velocity in which the values change. Siemens AG has a volatility of 18,33%, that means that the values move among an 18,33% respect the historical mean.

The Beta ( $\beta$ ) measures the difference between the profitability of the share respect its reference index. It is a volatility measure of an asset. A higher value of  $\beta$  means higher volatility. And a beta coefficient of 1,0 it is equivalent to the market. Siemens AG's Beta coefficient its 0,7, which means that if the index increase 10%; Siemens will increase a 7%. So we can conclude that Siemens' securities will flow close to the market and if the market goes up, Siemens' commodities will rise too but slightly below the market.

The most popular and traditional measure of risk is volatility. The main problem with volatility, however, is that it does not care about the direction of an investment's movement. For investors, risk is about the odds of losing money, and VaR is based on that common-sense fact. By assuming investors care about the odds of a really big loss, VaR answers the question, "What is my worst-case scenario?" or "How much could I lose in a really bad month?" The Value at Risk (VaR) shows the losses that you could have for each share showing which could be the loss of profitability.

For each share they risk a 1,43% daily. It is the chance they have of getting losses.



\*Source: Yahoo Finance

Eurostoxx50		Siemens AG	
Average	2614,68	Average	73,80
St. Deviation	253,94	St. Deviation	11,54
Av-St.Dev	2360,74	Av-St.Dev	62,26
Av+St.Dev	2868,63	Av+St.Dev	85,34
Coef. Var	0,10	Coef. Var	0,16
Rank	1072,99	Rank	53,53
Min	1995,01	Min	45,85
Max	3068,00	Max	99,38

\*Eurostoxx50 values from last 4 years

\*Siemens AG values from the last 4 years

In finance, the standard deviation is often used by investors to measure the risk of a stock or a stock portfolio. The basic idea is that the standard deviation is a measure of volatility: the more a stock's value varies from the stock's average, the more volatile the stock.

As we could see, Eurostoxx50 has a higher standard deviation so means that it is more volatile. Its stock values fluctuate more dramatically from the average in comparison with the Siemens's value.

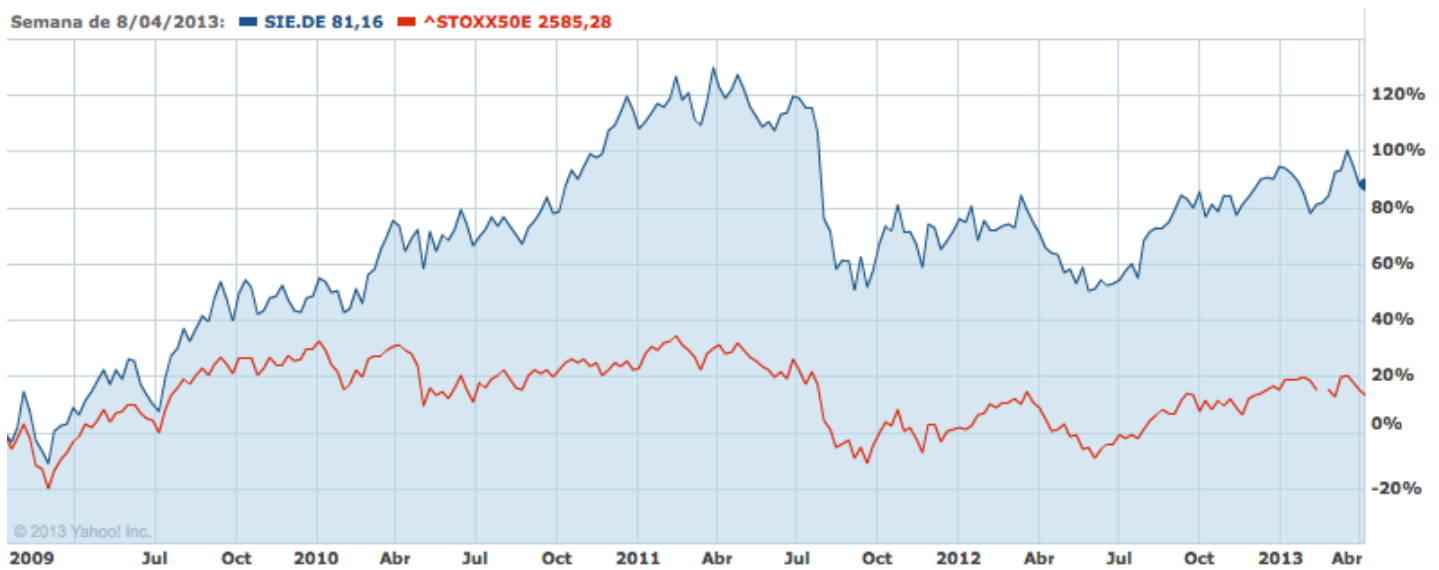
A high standard deviation means that the fund's returns have experienced strong variations, while a low standard deviation indicates that these returns have been much more stable over time. Logically, how much bigger the standard deviation, the higher is the potential loss; and therefore, the greater its risk. An investor is more likely to lose money in a fund that has strong fluctuations.



And other measure is the coefficient of variation. This allows you to determine how much volatility (risk) you are assuming in comparison to the amount of return you can expect from your investment. The lower the ratio of standard deviation to mean return, the higher is the expected return with less risk.

Contrary of what we have seen before, Eurostoxx50 has a lower CV which makes it less dispersed and less risky than Siemens AG.

To see it all together, Siemens has small standard deviation and is not very volatile this means that its share's price doesn't fluctuate much and it's not much risky. It's less volatile than its Index as the  $\beta$  value shows. Commonly, the higher the volatility is, the riskier the security. Siemens has lower chances to change dramatically its price and this makes them more stable.



\*Source: Yahoo Finance. Evolution of the Eurostoxx50's and the Siemens AG's stocks since 2009 until 08/04/2013

Otherwise we also have to take into account that the risk tends to disappear when our portfolio is formed by several assets, I mean we try to diversify the risk by investing in different securities. So it is possible to spread the risk, but however there will always remain a risk called systematic risk; there is continually the possibility of losing money.

## 2. Structure Risk

### Liquidity, Solvency and Leverage Ratios

In order to make this part of the essay we have taken into account only the Siemens AG's Annual report's dates and not the Amadeus values. The numbers were quite different from each other and it is more reliable the values issued by Siemens themselves. So we have remade the calculus for the ratios and as we thought are different from the ratios given by the Amadeus basis.

Financial ratio analysis is the calculation and comparison of ratios that are derived from the information in a company's financial statements. The level and historical

trends of these ratios can be used to make inferences about a company's financial condition, its operations and attractiveness as an investment. And help in knowing the company risk conditions.

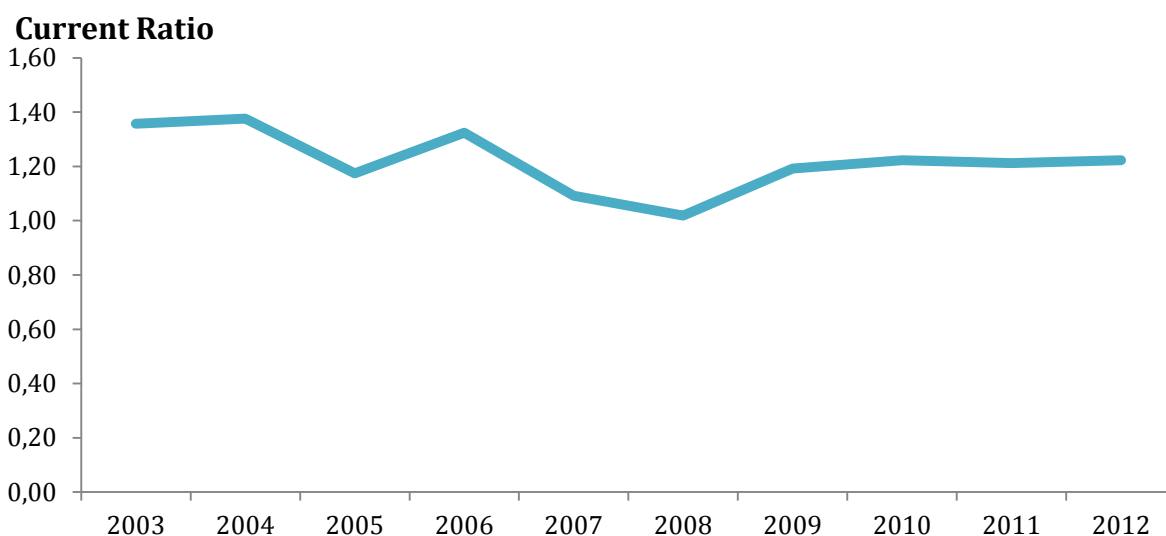
## Short-Term Risk

### - Current Ratio

The current ratio indicates a company's ability to meet short-term debt obligations. A current ratio between 1,5 and 3, it generally indicates good short-term financial strength. If current liabilities exceed current assets (the current ratio is below 1), then the company may have problems meeting its short-term obligations. If the current ratio is too high, then the company may not be efficiently using its current assets or its short-term financing facilities.

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Current Ratio	1,22	1,21	1,22	1,19	1,02	1,09	1,32	1,18	1,38	1,36



So the Siemens current ratio is always above 1 but never between the 1,5 and 3 so indicates that the firm has enough resources to pay its debts over the next 12 months but is not as good as it could be. Does not mean that the firm may have difficulty meeting current obligations but it is not a good ratio. Low values, however, do not indicate a critical problem. If an organization has good long-term prospects, it may be able to borrow against those prospects to meet current obligations.

It takes its lowest value in 2008, the nearest to 1, due to the start of the actual crisis. Some types of businesses usually operate with a current ratio less than one. For example, if inventory turns over much more rapidly than the accounts payable

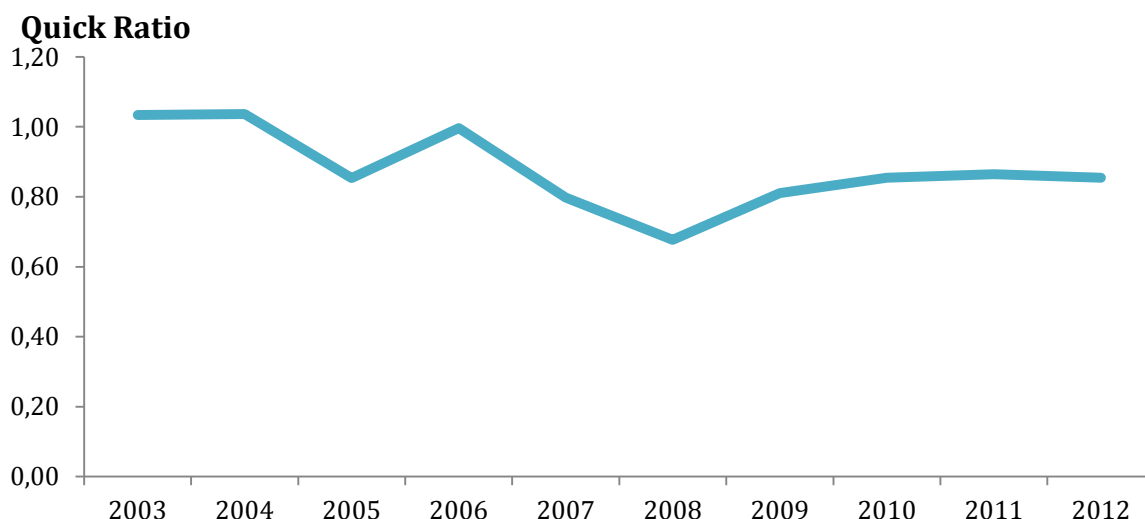
become due, then the current ratio will be less than one. This can allow a firm to operate with a low current ratio.

- **Quick Ratio**

This measures the ability of the company to use its near cash or quick assets to extinguish or retire its current liabilities immediately. Quick assets include those current assets that presumably can be quickly converted to cash. A company with a quick ratio of less than 1 cannot currently pay back its current liabilities.

$$\text{Quick Ratio} = \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$$

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Quick Ratio	0,85	0,86	0,85	0,81	0,68	0,80	1,00	0,85	1,04	1,03



So as we could see, despite in 2003 and 2004, all the years Siemens had a liquidity ratio lower than 1. This means that they had been having difficulties to meet current obligations using liquid assets. The worst year was 2008 and then the ratio increase but still maintaining below 1.

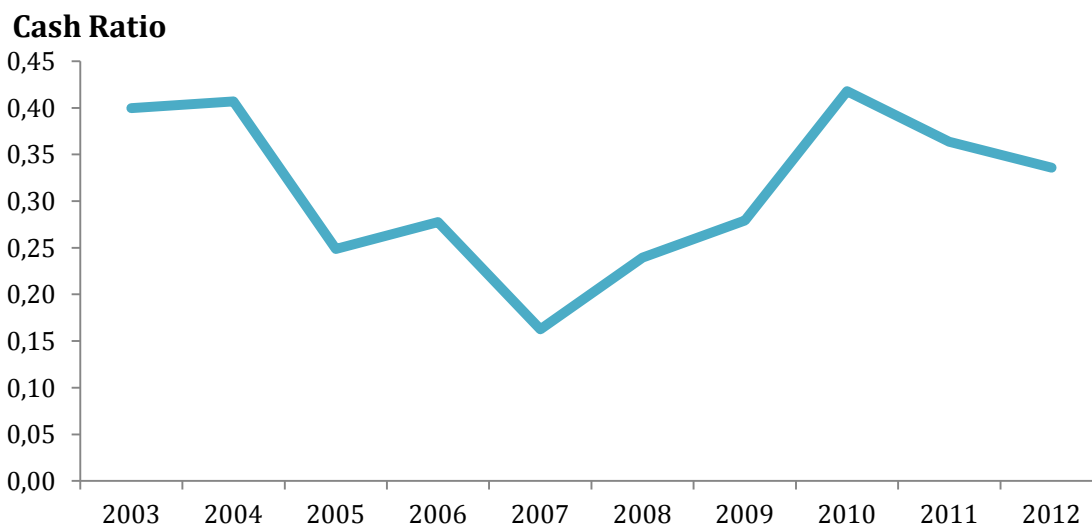
So could be said that Siemens had difficulties to meet they obligations using only they assets that are quickly converted to cash. If we take into account all the current assets (Current ratio) we could se that they are more solvent and can front their liabilities. Their current assets are not too far from their current liabilities has the current ratio shows, and if we take only those quick assets (removing the inventories) we see that they will have more difficulties meeting their obligations.

- **Cash Ratio**

This measures the ability of the company to front they short-terms obligations with their cash. It only looks at the company's most liquid short-term assets – cash and cash equivalents – which can be most easily used to pay off current obligations. Cash ratio is not as popular in financial analysis as current or quick ratios.

$$\text{Cash Ratio} = \frac{\text{Cash}}{\text{Current liabilities}}$$

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Cash Ratio	0,336	0,364	0,418	0,279	0,239	0,162	0,277	0,249	0,407	0,400



There is no common norm for cash ratio, in some countries a cash ratio of not less than 0,2 is considered as acceptable. But ratios that are too high may show poor asset utilization for a company holding large amounts of cash on its balance sheet, as could be the case of 2010, 2004 and 2003.

- **Working Capital**

Measure both a company's efficiency and its short-term financial health. The current assets cover the long-term needs of the company. The financial balance is respected and the company has, thanks to working capital, a surplus of stable resources to finance other short-term financing needs.

$$\text{Working Capital} = \text{Current Assets} - \text{Currents Liabilities}$$

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Working Capital	9492	92,53	9,057	7,124	0,791	4,038	12,654	6,970	12,574	11,461
WC turnover	8,25	7,94	8,39	10,76	97,76	17,94	6,90	10,82	5,98	6,48

\*in million of EUR

### Working Capital



Siemens working capital is always positive. Take the highest values in 2003 and 2004, and then fall and the next year, 2006, increase and take the biggest value of all. Then started to fall until 2008 when take the smallest value, really small in comparison with the other years. After that the working capital of Siemens started to grow and still doing nowadays but more slowly.

$$\text{Working capital turnover} = \frac{\text{Revenue}}{\text{Working capital}}$$

The working capital turnover ratio is used to analyze the relationship between the money used to fund operations and the sales generated from these operations. In a general sense, the higher the working capital turnover, the better because it means that the company is generating a lot of sales compared to the money it uses to fund the sales.

In 2008 when Siemens had the lowest WC is when had the biggest WC turnover.

### - Cash Conversion Cycle (CCC)

Cash conversion cycle is the time it takes a company to convert its resource inputs into cash. It measures how effectively a company is managing its working capital. Shorter the cash conversion cycle the better the company is off because it has to lock up cash for a relatively smaller period of time.

$$\text{Average inventory processing period} = \frac{\text{Inventories}}{\text{Revenues}} \times 365$$

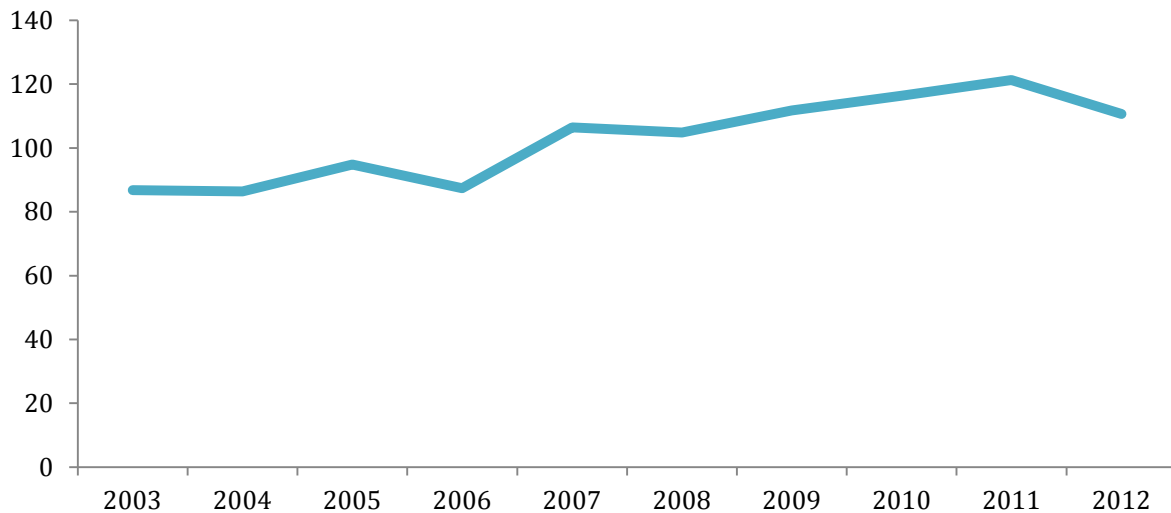
$$\text{Average receivable collection period} = \frac{\text{Receivables}}{\text{Revenues}} \times 365$$

$$\text{Average payables payment period} = \frac{\text{Payables}}{\text{Revenues}} \times 365$$

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Inventory processing period	100.28	106.87	97.68	93.43	88.97	91.02	73.22	82.45	74.07	71.97
Receivable collection period	61.53	69.66	70.67	71.98	71.76	74.99	67.44	78.84	72.79	73.12
Payables payment period	51.12	55.25	51.97	53.68	55.91	59.54	53.24	66.51	60.46	58.34
Cash Conversion Cycle (CCC)	110.69	121.28	116.37	111.74	104.82	106.46	87.43	94.78	86.41	86.75

$$CCC = \text{Inventory processing period} + \text{Receivable collection period} - \text{Payables payment period}$$

### Cash Conversion Cycle (in days)



So the cash conversion cycle measures the time between outlay of cash and cash recovery. This measure illustrates how quickly a company can convert its products into cash through sales. The shorter the cycle, the less time capital is tied up in the business process, and thus the better for the company's bottom line.

The CCC measures the time between outlay of cash and cash recovery. This measure illustrates how quickly a company can convert its products into cash through sales. Siemens AG's cash conversion cycle had the tendency to increase until 2011 that seems to decrease. The shorter the cycle, the less time capital is tied up in the business process, and thus the better for the company's bottom line.

## Long-Term Risk

### - Financial Leverage

Financial leverage can be aptly described as the extent to which a business or investor is using the borrowed money. Business companies with high leverage are considered to be at risk of bankruptcy if, in case, they are not able to repay the debts, it might lead to difficulties in getting new lenders in future. The most well-known financial leverage ratio is the debt-to-equity ratio.

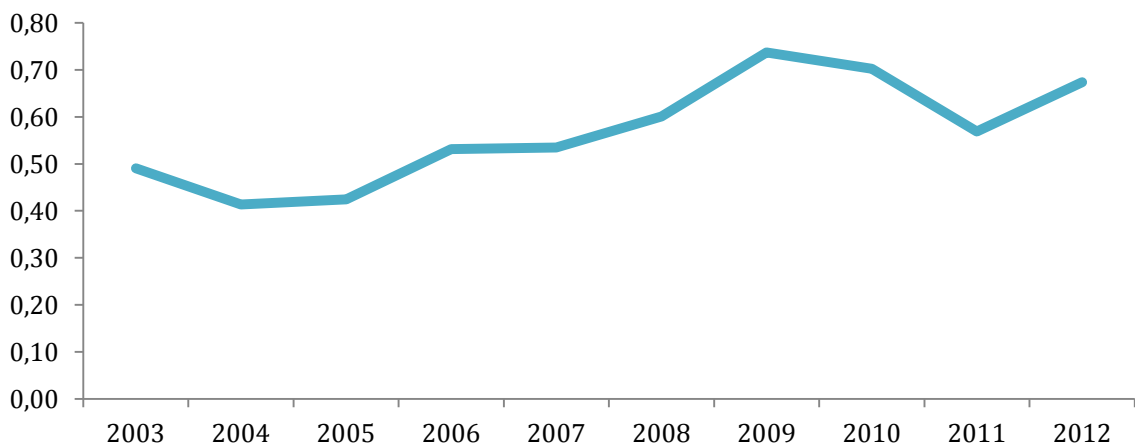
$$\text{Debt – to – Equity Ratio} = \frac{\text{Debt}}{\text{Equity}}$$

$$\text{Leverage Ratio} = \frac{\text{Assets}}{\text{Equity}}$$

If the ratio is increasing, the company is being financed by creditors rather than from its own financial sources, which may be a dangerous trend. Lenders and investors usually prefer low debt-to-equity ratios because their interests are better protected in the event of a business decline. Thus, companies with high debt-to-equity ratios may not be able to attract additional lending capital.

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Debt-to-Equity Ratio	0,67	0,57	0,70	0,74	0,60	0,53	0,53	0,42	0,41	0,49
Leverage Ratio	3,52	3,31	3,63	3,56	3,53	3,16	3,10	3,18	2,96	3,27

**Debt-to-Equity Ratio**

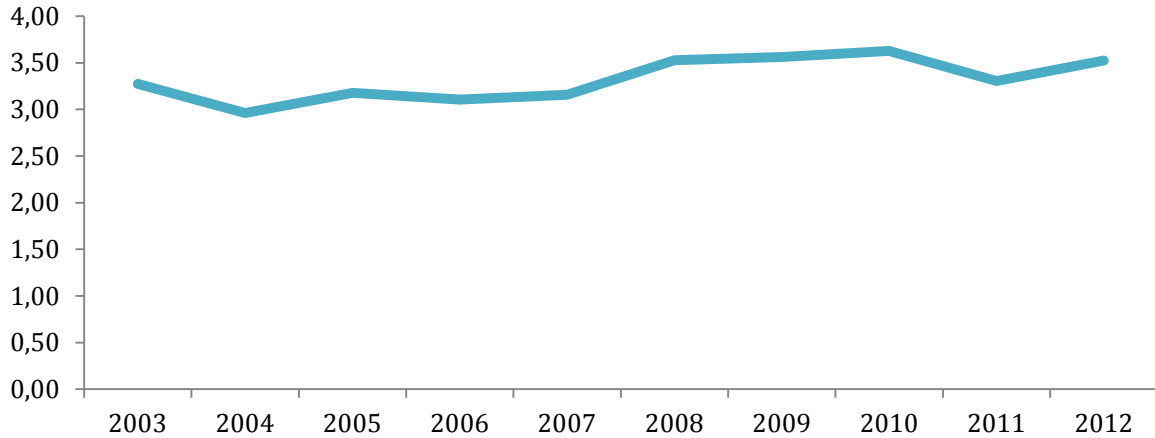


Debt to Equity ratio indicates the relative proportion of shareholders' equity and debt used to finance a company's assets. A low debt to equity ratio indicates lower risk, because debt holders have less claims on the company's assets.

A high debt to equity ratio usually means that a company has been aggressive in financing growth with debt and often results in volatile earnings.

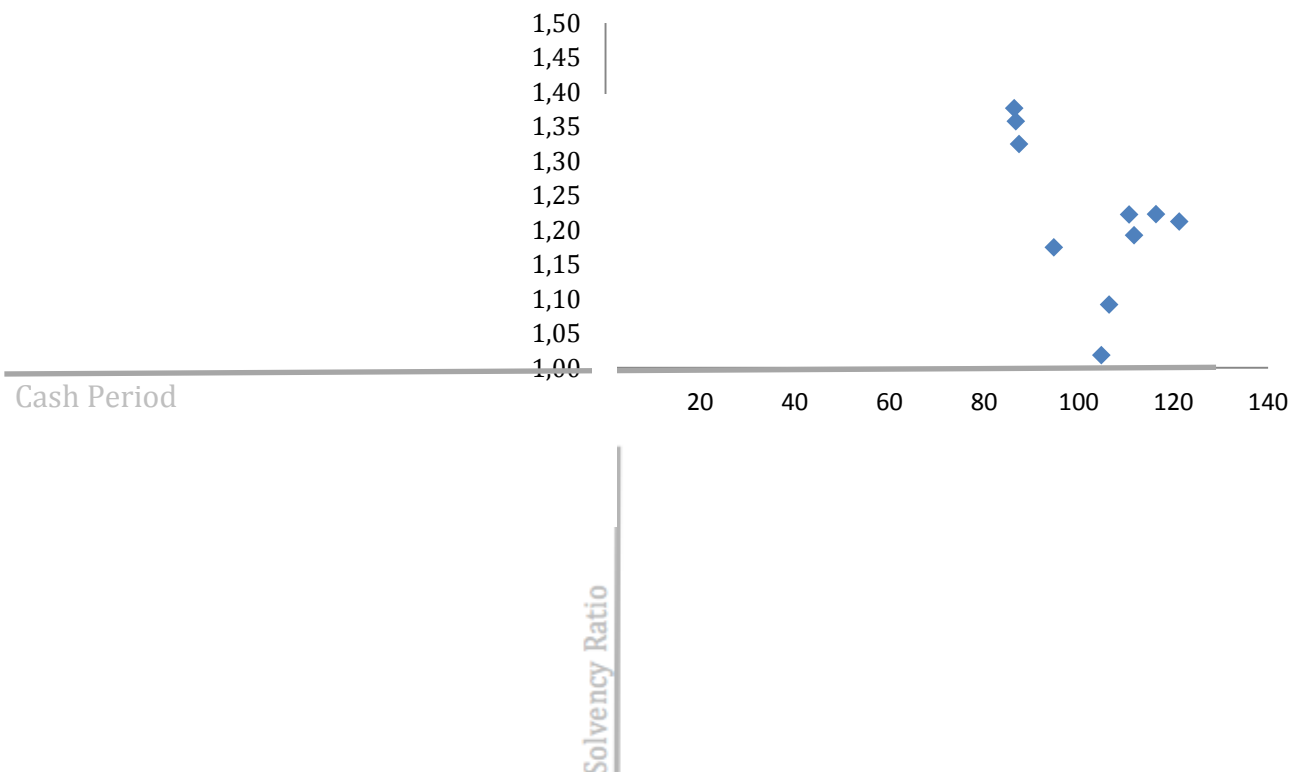
In general, a high debt-to-equity ratio indicates that a company may not be able to generate enough cash to satisfy its debt obligations. However, a low debt-to-equity ratio may also indicate that a company is not taking advantage of the increased profits that financial leverage may bring; that is the case of Siemens.

### Leverage Ratio



The financial leverage ratio is a measure of how much assets a company holds relative to its equity. A high financial leverage ratio means that the company is using debt and other liabilities to finance its. And would be more riskier than a company with lower leverage. Siemens has always values of 3-3,5; a leverage ratio greater than 2,0 means that a company uses more debt than equity to finance it assets. It is when we see ratios of 4,5 or more that companies start to get really risky.

### Solvency-Liquidity





In order to be more clear and show if Siemens is in a risky place we had made a solvency-cash period graphic. As we could see Siemens is always in the same quadrant with a positive Solvency Ratio and a positive Cash Period. This means that they aren't in a risky position.

### 3. STOCK PRICE EVOLUTION FORM 2009 UNTIL 2013



\* Source: Yahoo Finance 22/04/2013

We have used the Exponential Moving Average (EMA) instead of the Simple Moving Average (SMA) because differently from SMA, it gives more importance to the last sessions than the oldest ones. Moreover the EMA also shows the graphics movements in a smoother way.

This graphic shows the Siemens stock price evolution up to 2013 (more concretely from 4/22/2009 to 4/22/2013). The theory says that if the mean goes up the tendency is bullish and contrary if the mean goes down the tendency is bearish. In addition, we have also to take into account that the short mean will show a change of tendency earlier that the long means. This is due to the fact that as fewer seasons are used to calculate the EMA, the average moves closer to the prices and it is more sensible and, when it is larger, it moves farthest from the prices and it is more insensible.

The red line is the mean of 50 seasons, the green one is the mean of 100 and the brown is the mean of 200.

First of all, the graph shows us a positive trend in the stock price evolution of Siemens from July 2009, when the short-term indicator starts to go up. This

alteration can be seen as an indicator of trend change, despite the mid and long-term indicators did not start to rise yet. As soon as the green line starts to go up we are surer of the change of tendency and we can ensure that the stock price evolution in that moment was positive. This trend was reaffirmed when the long-term line intersects with the mid-term line. As we can see on the graphic the three lines follow a parallel behavior that trends to separate into timeline. This behavior means that the trends will continue and will be a strong tendency. This trend continues until 2011 and as it is a strong bullish tendency we can conclude that it was a good period to sell our shares of Siemens, but at the same time, this period was also good for that people who wanted to buy Siemens shares because in that moment their price was constantly increasing, so they would sell later their shares at a higher price than they had paid for.

As we have mentioned before there is a change of tendency in July 2011 when the short-term line starts decreasing. As before, we can ensure the change of tendency when the mid-term average starts to decrease and reaffirm the fact, when the long-term line crosses the mid-term. But unlike the first tendency, which is clearly bullish, this one also shows a period of time where it does not rise and neither decreases. For this reason we can say that people who was interested in buying shares was preferable to do it from July 2011 to, more or less, October 2011 and from April 2012 to July 2012 taking into account the fact that the first period of time mentioned decreases faster than the second one.

Finally the graph shows a last change of tendency. In July 2012 the short-term EMA clearly shows a second bullish tendency up to nowadays. But in contrast to the other bullish trend it is not as bullish as the one mentioned at the beginning. Furthermore, as the price of Siemens' shares is continuously rising, it is a good moment for selling shares, as people who hold them are able to sell the shares at a higher price than one day bought them.

On the other hand we have been looking into different stock price forecasts and from thirty analysts that offer 12-moth price forecasts for Siemens AG, we conclude that the company has a median target of \$114,74, with a high estimate of \$129,12 and a low estimate of \$91,21. The median estimate represents a +11,5% increase from the last price \$112,87.



\*Source: The Wall Street Journal 22/04/2013

After these small findings, we can conclude that people should hold their shares for the next four months, as the median and the low estimate are quite similar, and

later, depending how the market flows, they could evaluate whether to sell or not, waiting the share price to raise.

## 4. Evaluation of profit and losses account from 2008 to 2012

\*EUROS IN MILLIONS

\*Fiscal year end in September

	2008-09	2009-09	2010-09	2011-09	2012-09
Sales	77,327	76,651	75,978	73,515	78,296
<Cost of good sold>	<56,284>	<55,941>	<54,331>	<51,388>	<56,092>
<b>GROSS PROFIT</b>	<b>21,043</b>	<b>20,710</b>	<b>21,647</b>	<b>22,127</b>	<b>22,204</b>
<Op. expenses>	<18,551>	<14,363>	<15,731>	<14,169>	<15,400>
<b>OP. INCOME</b>	<b>2,492</b>	<b>6,347</b>	<b>5,916</b>	<b>7,958</b>	<b>6,804</b>
<interests>	<0,997>	<0,683>	<1,890>	<1,716>	<1,728>
<b>Other income &lt;expeses&gt;</b>	1,379	<1,773>	1,785	3,000	2,203
<b>INCOME BEFORE TAXES</b>	<b>2,874</b>	<b>3,891</b>	<b>5,811</b>	<b>9,242</b>	<b>7,279</b>
<Taxes>	<1,015>	<1,434>	<1,699>	<2,231>	<2,094>
<b>NET INCOME CONT. OP</b>	<b>1,859</b>	<b>2,457</b>	<b>4,112</b>	<b>7,011</b>	<b>5,185</b>
<b>NI from discounting op.</b>	4,027	0,40	<0,44>	<0,690>	<0,595>
<b>Other</b>	<0,161>	<205>	<0,169>	<0,176>	<0,132>
<b>NET INCOME</b>	<b>5.725</b>	<b>2,292</b>	<b>3,899</b>	<b>6,145</b>	<b>4,458</b>

### SALES:

As we can observe on the Profit and Losses Accounts<sup>1</sup> for the past five years, sales have been decreasing up to 2011 and then in 2012 they have suffer an importance increase.

For decades Siemens has been the problem child of European heavy industry, lurching from profit to loss almost each quarter as big infrastructure projects went wrong or spending spiraled out of control. Even when it made a profit, its margins were to thin to cover its cost of capital. Underlying all this, Siemens was badly managed for a long time, just so badly that between 2006 and 2008 it was embroiled in a bribery issue.

But few things focus quite as well as a crisis. The company was sinking so the board was forced to look for an outsider to head the company and it chose Peter Löscher. From the beginning Peter Löscher has struggled counter, facing the World Economic Crisis, to reposition the company and develop a stronger trademark to obtain a monopolistic position on the market.

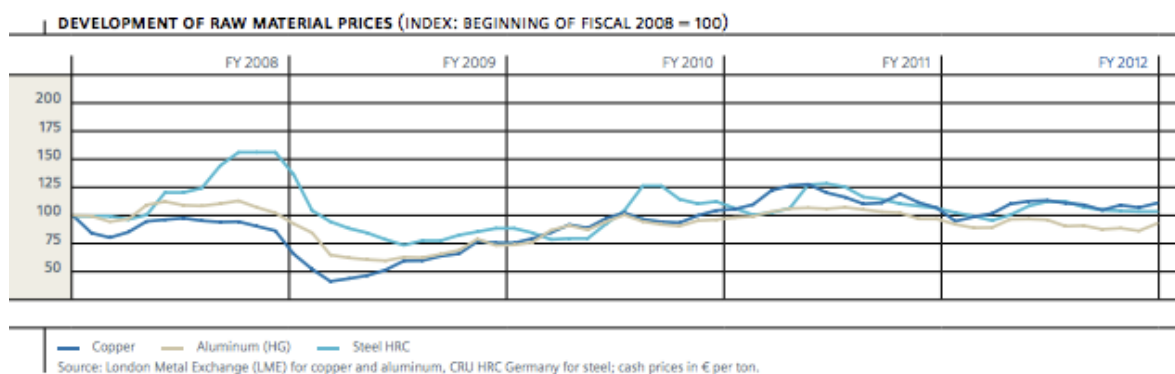
<sup>1</sup> The Table has been extracted from the Annual Reports of Siemens AG.

Otherwise, Siemens have used only one brand name for trading for years and Peter Löcher and the rest of the Board of Presidents have tried to clean the image of the company and related it with security, loyalty, high technology and innovation. But, due to the crisis, this reorganization and reorientation of the company have not come to light until a year ago, until 2012, where the revenues of Siemens increased so heavily, in fact the sales have increased nearly five points from last year.

For this reason we can conclude that nowadays the public image of Siemens does not represents a risk for its sales and neither for the company survival as it did years back.

## COST OF SALES

### a. RAW MATERIALS PRICE RISK



\*Source: London Metal Exchange

The different sources of business of Siemens are dependent on the development of raw material prices. The main key materials to which they have significant cost exposure include copper (strong blue line in the graph), various formats of steel (light blue line) and aluminum (grey line). In addition, within stainless steel they have considerable exposure related to nickel and chrome alloy materials.

The average monthly price of copper (denominated in € per metric ton) for September 2012 was 4% higher than the average monthly price in September 2011; this reversed a previously negative trend year-over-year and was due to the release of financial and fundamental stimulus programs. Prices on a fiscal-year average were 8% lower in fiscal 2012 than the average for fiscal 2011. Prices for copper are still supported by tight supply and demand fundamentals and by speculative influences in the commodity markets. Nevertheless, because copper is produced in multiple locations and traded, such as across the London Metal Exchange, the risk to Siemens is primarily a price risk rather than a supply risk.

Average monthly prices of aluminum (grey line) traded at the London Metal Exchange faced more pressure year-over-year, losing 4% in September 2012 compared to September 2011. While, among other factors, high-energy costs put upward pressure on aluminum, these were more than offset by oversupply. As

with copper, we see developments in the aluminum market as posing a price risk, rather than a supply risk.

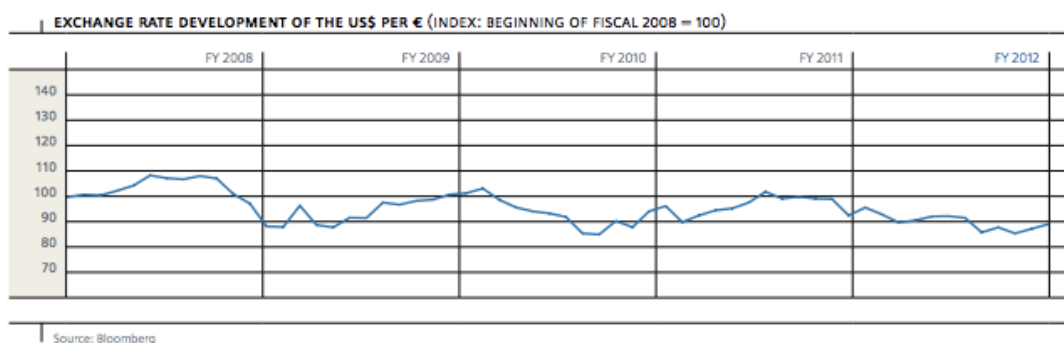
The average monthly steel prices (light blue line) for September 2012 came down by 3% compared to the average monthly prices in September 2011. Especially at the end of fiscal 2012, steel markets and prices for upstream raw materials (e.g. iron ore) softened significantly

To finish, their principal exposure to the prices of copper, steel and stainless steel, is in the Sectors Energy, Industry and Infrastructure&Cities. Secondly their main price exposure related to aluminum is in the Energy Sector. In addition, Siemens is generally exposed to energy and fuel prices, both directly (electricity, gas, oil) and indirectly (energy used in the manufacturing processes of suppliers). Moreover some other continuing operations which face price and supply risks are related to rare earth metals, particularly the Industry Sector's Drive Technologies Division and the Energy Sector's Wind Power Division

Siemens employs various strategies to reduce the mentioned price risk in its project and product businesses, such as long-term contracting with suppliers, physical and financial hedging and price escalation clauses with customers

## b. INTERESTS

### The exchange rate risk



\* Source: Bloomberg

In addition to the common currency of the European Monetary Union (the euro, €) another key currency for Siemens is the US dollar. Following an appreciation of the euro (EUR) against the US\$ at the beginning of fiscal 2012, concerns over the sovereign debt crisis in a number of southern European member states of the European Monetary Union led to decline of € against the US\$.

For the remainder of fiscal 2012, the value of the EUR€ relative to the US\$ remained below its level at the end of fiscal 2011. During July 2012, the value of the € against the US\$ reached its lowest levels of the fiscal year. Only at the end of fiscal 2012 did the value of the € begin to recover somewhat.

Among the contributing factors were the German constitutional court's rejection of applications to block the ESM and the ECB's announcement of the modalities of a new government bond purchase program. Nevertheless at September 30, 2012, the value of the € against the US\$ was around 4% below the level a year earlier.

In contrast to the share price the exchange rate is an uncontrolled fluctuation and it affect us in our transactions, imports and exports, so for covering our shoulders Siemens uses Future contracts, currency options and currency forward contracts.

### The Interest rate risk<sup>2</sup>

<i>DATA IN MILLION OF EUR</i>	<b>2012 - 09</b>	<b>2012 -12</b>
<b>Short term debt and current maturities of long term debt</b>	3,709	3,826
<b>Long term debt</b>	16,651	16,880
<b>Cash and cash equivalents</b>	<7,823>	<10,891>
<b>Current available for sale financial assets</b>	<517>	<524>
<b>NET DEBT</b>	12,020	9,292

The interest rate risk is the risk related to the borrowing with variable interest rate. As Siemens AG is a huge conglomerate enterprise, it borrows money of many different Financial Entities and moreover it also issues bonds, so the changes in the interest rate does represent a risk for the company.

As we can observe on the above table neither our short-term nor long-term debt have been increased in this last year. Moreover the company makes regular appearances on the world's capital markets and it has recently issued bonds to face its obligations. In addition, in order to guarantee to our clients the investments security of the bonds, we count with two rating agencies: *Moody's Investors Service* and *Standard & Poor's* which rate our debt as stable.

Now we attach a table with current ratings:

<b>Rating Agency</b>	<b>Long-term</b>	<b>Short-term</b>	<b>Outlook</b>	<b>Last update</b>
<b>Moody's</b>	Aa3	P-1	Stable	Jun 2012
<b>Standard &amp; Poors</b>	A+	A-1+	Stable	Nov 2012

On June 2012 Moody 's raised its long-term Siemens' credit rating from "A1" to "Aa3." The rating classification "Aa" is the second highest rating within Moody's debt ratings category. Then, the number "3" indicates a ranking in the lower end of that rating category. At the same time Moody's revised its outlook for our credit rating from "positive" to "stable". Furthermore on June 2012 Moody's affirmed our "P-1" short-term rating.

<sup>2</sup> The data of both tables have been extracted from the Annual Reports of Siemens

Lately, on November 2012, the other rating company, Standard&Poors also revised its outlook for Siemens' credit rating from "positive" to "stable". At the same time, S&P affirmed the "A+" long-term corporate rating and the "A-1+" short-term rating, which is the highest short-term rating within the S&P's short-term rating scale.

## 5. RESERVE EVOLUTION OF THE LAST FOUR YEARS

*DATA IN MILLION OF EUR	2012	2011	2010	2009
<b>Short-term debt and current maturities of L-T debt</b>	3,826	3,660	2,416	698
<b>Long term debt</b>	16,880	14,280	17,497	18,94
Retained earnings	22,756	25,881	29,998	22,696

\*Source: Annual Reports of Siemens

As we can see on the table there is a really huge variation from the short-term debt of 2009 and 2010. This fact has his explanation on the changes that suffered the company on 2008. This year was a key year for Siemens AG as its Board of Director was changed and a deep reformation was started. Siemens had not got the clean and strong image as it has nowadays.

With the same idea, the Board of Directors also enlarged the retained earnings seven points above the last year. But it is not considered a risky operation, as while the reserves increase, .the long-term debts decrease.

If we analyze the last year we can conclude that, in relation to 2009, the long-term debt has been reduced while the short-term debts have been increased and the reserves remain the same. Another time we conclude that it does not represent a risky situation, as the long-term debt has been reduced two points and the company operates with more short-term debt than long and it seems to manage its operations more optimally than it did later on 2008.

The only case where we can perceive a risky operation is during the 2010 period because both short-term and long-term debt was largely increased while the reserves also increased a lot.

# **Bloc 3**

## **Profitability Analysis**



# Index

- ROE – RETURN ON EQUITY
- ROE BT – RETURN ON EQUITY BEFORE TAX
- ROE AND ROE BT - FISCAL IMPACT
- COMPARISON OF ROE
- ROA – RETURN ON ASSETS
- COST OF CAPITAL, K
- RISK AND PROFITABILITY 3D GRAPH
- VALUE-ADDED
- GROWTH RATE

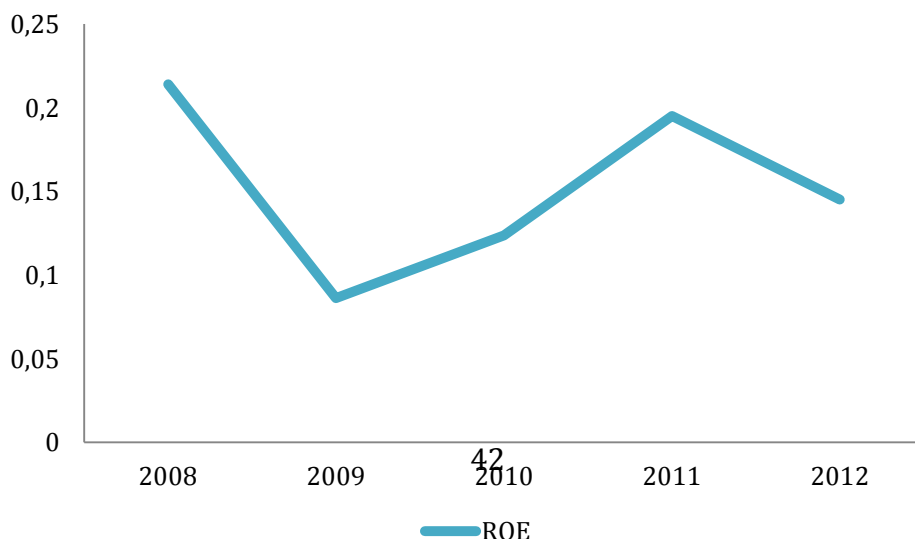
# 1. ROE – Return On Equity

ROE shows how well a company uses investment funds to generate earnings growth. ROEs between 15% and 20% are generally considered good. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

$$ROE = \frac{\text{Net Income}_{31-12}}{\text{Equities}_{31-12}} = \underbrace{\frac{\text{Net Income}}{\text{Revenues}}}_{\text{Margin Ratio}} * \underbrace{\frac{\text{Revenues}}{\text{Assets}}}_{\text{Turnover Ratio}} * \underbrace{\frac{\text{Assets}}{\text{Equities}}}_{\text{Leverage Ratio}}$$

It also could be calculate by multiplying the Margin ratio, the Turnover ratio and the Leverage ratio. The margin ratio is a ratio of profitability calculated as net income divided by revenues. It measures how much out of every dollar of sales a company actually keeps in earnings. A higher profit margin indicates a more profitable company. The turnover ratio evaluates how well a company is utilizing its assets to produce revenue, the higher the number the better. And the leverage ratio (as we had explain before) is a measure of how much assets a company holds relative to its equity. A high financial leverage ratio means that the company is using debt and other liabilities to finance (is getting more financing from outside creditors). And would be more riskier than a company with lower leverage.

	2008	2009	2010	2011	2012
<b>Margin ratio</b>	0,074	0,030	0,046	0,084	0,057
<b>Turnover ratio</b>	0,819	0,807	0,739	0,705	0,723
<b>Leverage ratio</b>	3,528	3,562	3,628	3,306	3,523
<b>ROE</b>	0,214	0,086	0,124	0,195	0,145



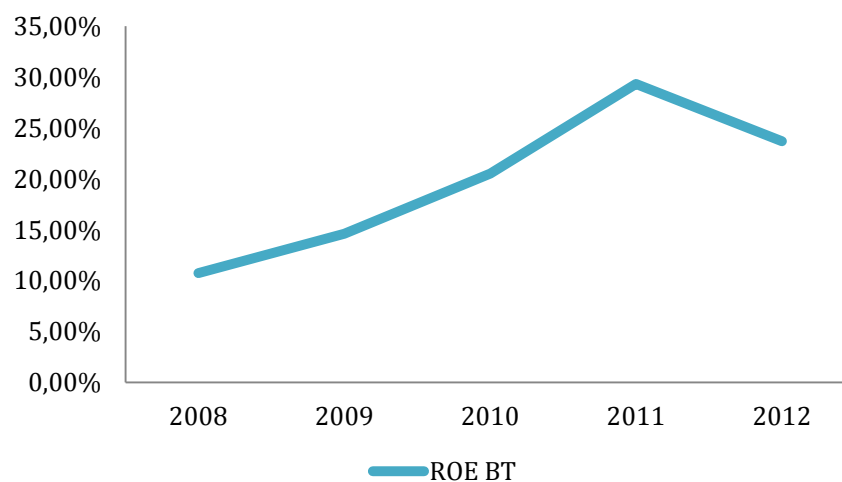
As we have said before, the ROE is good when it takes values between 15-20%, this only happens three years: 2008, 2011 and 2012. So after 2008 the ratio decreases a lot due to the fall of the margin ratio and reaches its minimum in 2009. This fall might be related with the company's repeated scandals and corruption. Then after 2009 the ROE increased until last year that fell down again. The leverage ratio has always, more or less, the same values as the turnover ratio; it is the margin ratio values that fluctuate more. It would appear that greater gearing increases ROE, but this must be traded-off against higher financing costs, which reduces profit.

## 2. ROE BT – RETURN ON EQUITY BEFORE TAX

This is the same as Return on Equity explained earlier but before had taken into account the taxes.

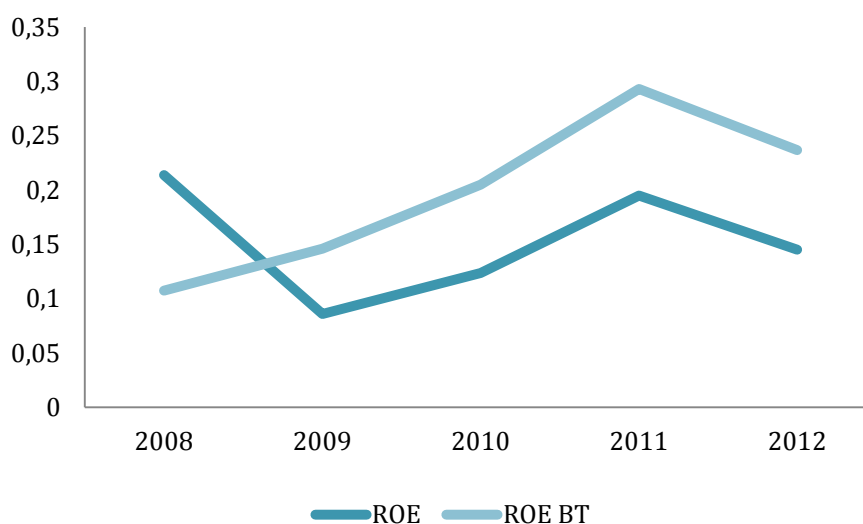
$$ROE_{BT} = \frac{EBT}{Equities} = \frac{Net\ Income * (1 - real\ tax\ rate)}{Equities}$$

	2008	2009	2010	2011	2012
<b>Income Before Tax</b>	2,874	3,891	5,811	9,242	7,279
<b>Net Income</b>	5,725	2,292	3,503	6,145	4,458
<b>Real Tax Rate</b>	35%	37%	29%	24%	29%
<b>Shareholder's Equity</b>	26,774	26,646	28,346	31,531	30,733
<b>ROE BT</b>	10,73%	14,60%	20,50%	29,31%	23,68%



The ROE BT had the tendency to increase until 2011 where take the highest percentage of almost 30%. This is due to the increase of the equity and also the higher value of income before tax.

### 3. ROE and ROE BT - Fiscal Impact



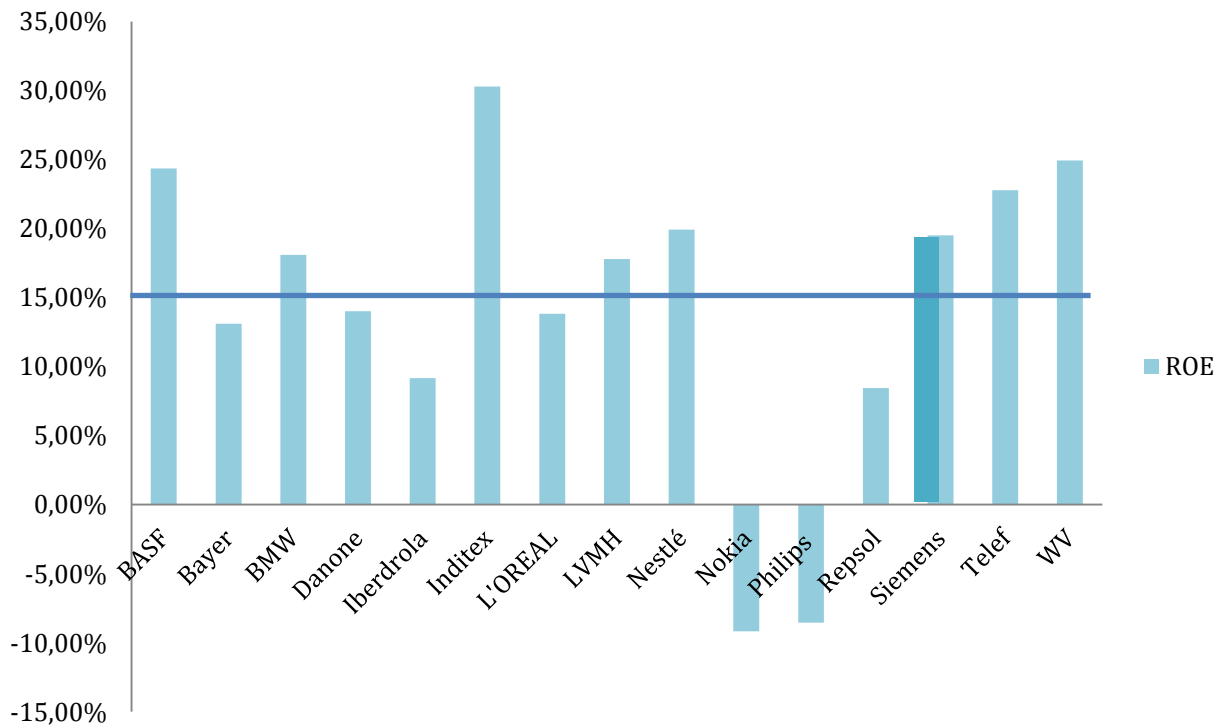
If we compare the ROE after and before tax, we could see that in 2008 and 2009 they had a completely different behavior due to the difference between the income after and before tax. The income before tax increase while the after tax decrease. Then they behave equal and the difference between the two lies and between before and after tax is the fiscal impact of the taxes.

### 4. COMPARISON OF ROE

And if we take a look into the other companies of the EUROSTOXX50 we could see that we are above the average in terms of return on equity.

2011	ROE	Margin	Turnover	Leverage
<b>Inditex</b>	30,29%	0,141	1,400	1,530
<b>WV</b>	24,94%	0,045	0,628	4,010
<b>BASF</b>	24,35%	0,084	1,201	2,410
<b>Telef</b>	22,77%	0,090	0,480	4,700
<b>Nestlé</b>	19,92%	0,149	0,749	1,783
<b>Siemens</b>	19,50%	0,084	0,705	3,306
<b>BMW</b>	18,10%	0,071	0,558	4,554
<b>LVMH</b>	17,80%	0,130	0,630	2,160
<b>Danone</b>	14,00%	0,086	0,689	2,380
<b>L'OREAL</b>	13,82%	0,120	0,757	1,523
<b>Bayer</b>	13,10%	0,068	0,709	2,726
<b>Iberdrola</b>	9,17%	0,091	0,330	2,920

<b>Repsol</b>	8,44%	0,042	0,778	2,603
<b>Philips</b>	-8,55%	-0,035	0,691	2,138
<b>Nokia</b>	-9,17%	-0,038	0,980	2,400
<b>Average</b>	15,61%	0,081	0,806	2,939



And if we only focus on those companies that are from the same country as our company, Germany, and we now compare us with the other German companies of the Eurostoxx50 we could see that our ROE is in the middle of them. Not the best and not the worst, just in the middle.

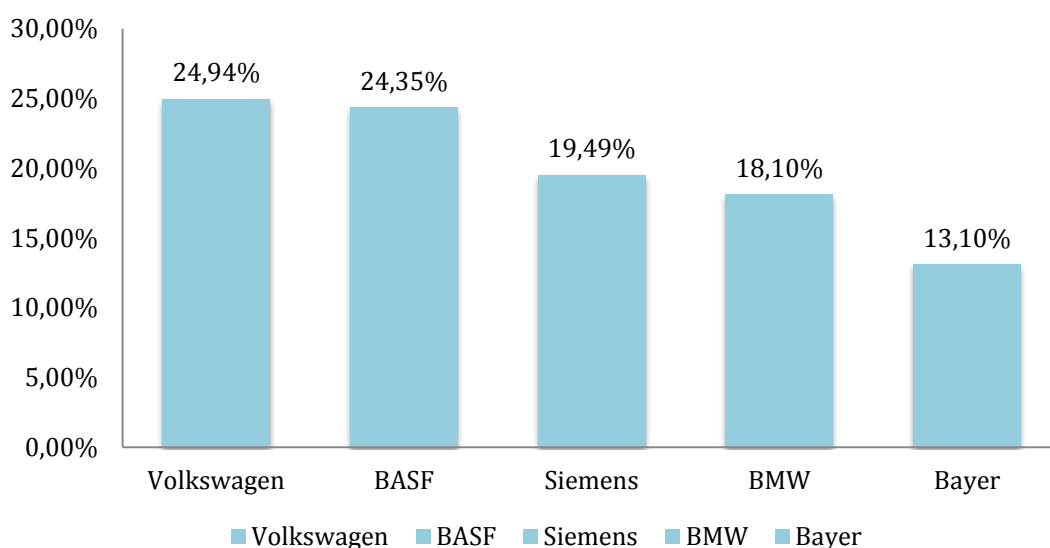
2011	ROE	Margin	Turnover	Leverage
<b>Volkswagen</b>	24,94%	0,045	0,628	4,010
<b>BASF</b>	24,35%	0,084	1,201	2,410
<b>Siemens</b>	19,49%	0,084	0,705	3,306
<b>BMW</b>	18,10%	0,071	0,558	4,554
<b>Bayer</b>	13,10%	0,068	0,709	2,726

The table that we have just referred shows that the two firms on the top almost have the same ROE value and our company that is stuck in the middle is close to BMW (18,10%) and pretty far from BASF and Volkswagen. If we want to reach the

values of these two large enterprises what might be more intelligent would be to increase the turnover ratio.

As we can see, BAFT has the same margin ratio and the Volkswagen's ratio is nearly the half. What refers to the turnover ratio, BAFT and us have almost the same ratio values, but Volkswagen's leverage is one point above us, leading to a higher risk since the leverage ratios that exceeds from 4 are considered hazardous.

Thus the smarter way to raise our return on equity would be increasing our turnover trying to manage our assets more carefully and efficiently. The higher the turnover, the better.



## 5. ROA – Return On Assets

An indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. It is calculated by dividing a company's annual earnings by its total assets. The assets of the company are comprised of both debt and equity. Both of these types of financing are used to fund the operations of the company. The ROA figure gives investors an idea of how effectively the company is converting the money it has to invest into net income. The higher the ROA number, the better, because the company is earning more money on less investment.

$$ROA = \frac{EBIT_{31-12}}{Assets_{01-01}} = \frac{EBIT_{31-12}}{Revenues_{31-12}} * \frac{Revenues_{31-12}}{Assets_{01-01}}$$

	2008	2009	2010	2011	2012
<b>EBIT (Op. Income)</b>	2,492	6,347	5,916	7,958	6,804
<b>Total Assets</b>	94,463	94,926	102,827	104,243	108,282
<b>ROA</b>	2,64%	6,69%	5,75%	7,63%	6,28%

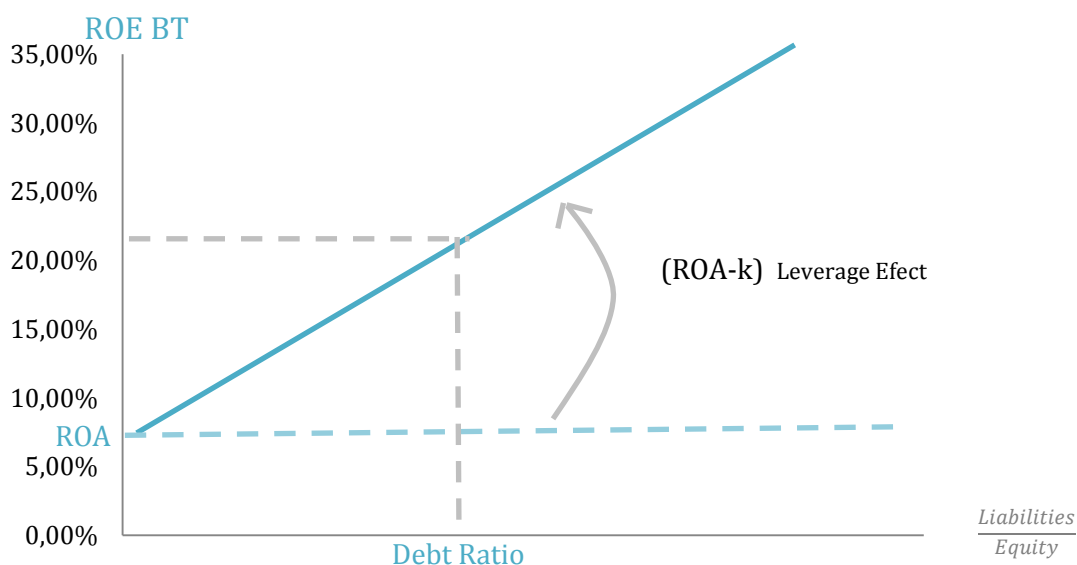


As we could see in the graphic, the Siemens AG's ROA has the tendency to increase despite in 2010 that had a drop and last year also decrease. The assets have increase year after year and the EBIT had increase a lot to 2008 to 2009 and then stabilized the increasing. This percentage shows how profitable are the company's assets in generating profits. How many euros of earnings they derive from each dollar of assets they control.

## 6. ROA AND ROE BT – DEBT IMPACT

Return on assets is an indicator of how profitable a company is before leverage not as the ROE that take into account the leverage effect.

	ROE BT	Debt ratio	ROA
2012	23%	2,523	6,30%



The debts have the same effects over the financial profitability as those of a level, that's why it is called the leverage effect.

Is it characterized by the raise of the economic profitability when increasing debt, only when the economic profitability is higher than the borrowing cost. In the same way we must take into account that as more money we borrow, more probability of insolvency there will be, especially in these times of financial uncertainty.

For those reasons, the most rentable way to finance a company is getting indebted instead of reinvesting the company's revenues. The main advantage is that we do not have to pay taxes for the money that we don't have, so all the money we borrow from the banks is duty free, so we save a large amount of cash.

In contrast, if a company tries to be profitable by reinvesting, it would have a really large equity, but simultaneously its ROE would be very small in comparison with the cost of reinvesting.



## 7. Cost of Capital (k)

The cost of capital (k) is the required return necessary to make a capital budgeting project. Determines how a company can raise money (through a stock issue, borrowing, or a mix of the two). The cost of capital is composed by the euribor plus the risk premium. Also could be expressed with the following formula:

$$k = e + \frac{\text{Liabilities}}{\text{Equity}} * j$$

The  $j$  represents the sensibility of the banks letting money to a company. And after making some calculus, we have arrived to a value of 0,0043, very low, which means that the bank is very sensitive letting us money. And if we carry out this equation, we conclude that our cost of capital (k) is 0,0061. With a higher value of k, more costly is to get into debt. So we won't have problems and won't be difficult for us to borrow money from the banks.

<b>e</b>	0,0049
<b>Liabilities</b>	77549
<b>Equity</b>	30733
<b>ROE BT</b>	0,24
<b>ROA</b>	0,063
<b>j</b>	0,004369318
<b>k</b>	<b>0,00612516</b>

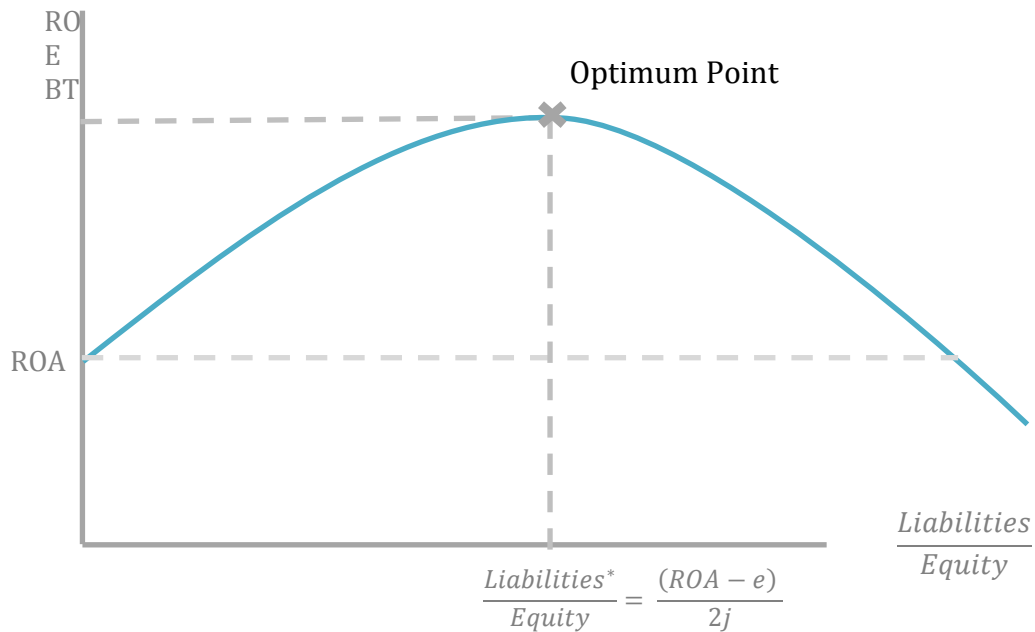
The ROA have to be bigger than the k as the return has to be higher than the cost of debt if we want to be rentable:

$$ROA > k \rightarrow 0,24 > 0,0061$$

Now we also could express the formula of ROE BT in another way:

$$ROE BT = ROA + (ROA - e) * \frac{\text{Liabilities}}{\text{Equity}} - j * \left( \frac{\text{Liabilities}}{\text{Equity}} \right)^2$$

This is now an exponential equation and we represent it like this:



In order to find the optimum point that shows us the level of debt that gives us the maximum ROE BT; we work out the derivatives of the equation above.

$$\frac{\partial ROE BT}{\partial Liabilities/Equity} = 0 + (ROA - e) - 2j * \frac{Liabilities}{Equity}$$

$$(ROA - e) - 2j * \frac{Liabilities}{Equity} = 0$$

$$\frac{Liabilities}{Equity} = \frac{(ROA - e)}{2j} \longrightarrow \text{Debt Ratio that will give us the maximum ROE BT}$$

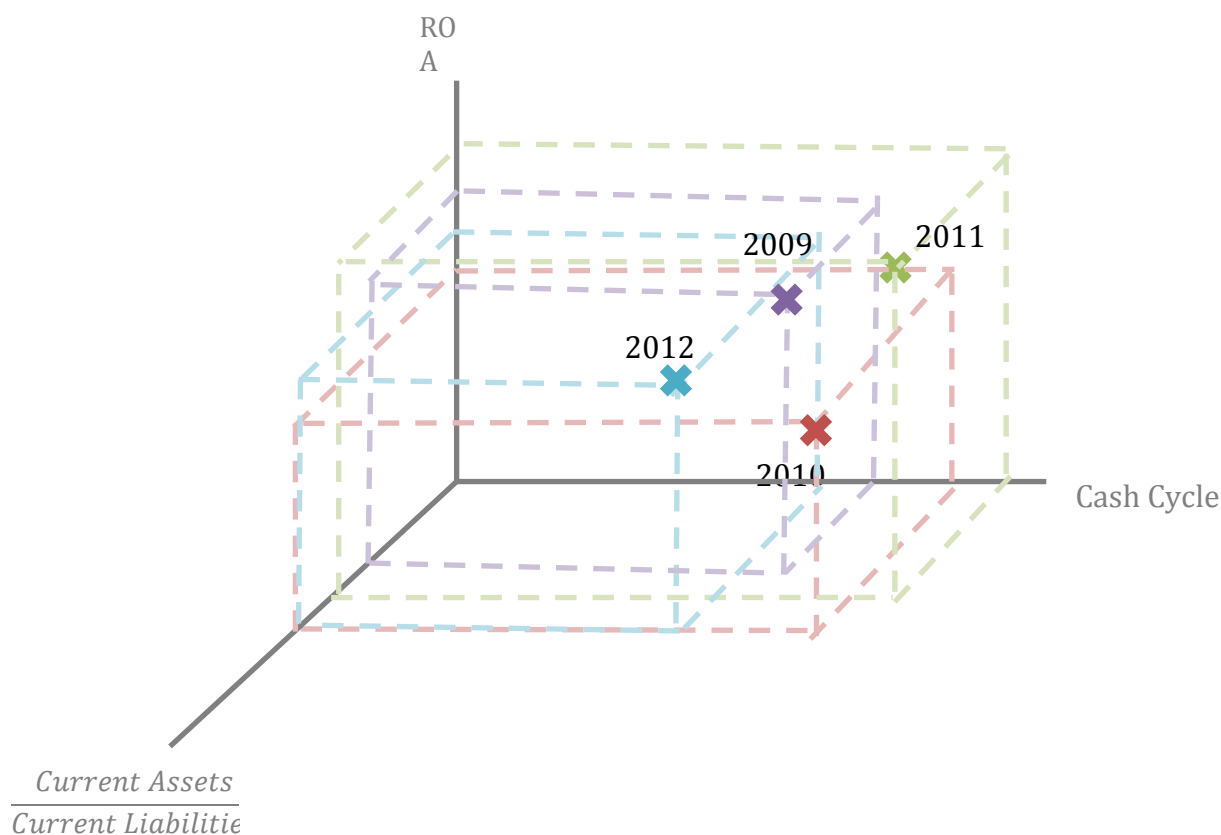
2012	Real	Ideal point
Debt Ratio	2,523	6,630

The real Debt ratio that Siemens had in 2012 was 2,523 that gives a ROE BT of 24%. And after working out the value of debt ratio that will tell us the maximum ROE BT and will situate us in the ideal point, we arrive at a value of Debt ratio of

6,630. This debt ratio entails a Leverage ratio of 7,630, which is very high and will mean that we are very financed by external creditors.

## 8. RISK AND PROFITABILITY 3D GRAPH

	✕ 2012	✕ 2011	✕ 2010	✕ 2009
<b>Cash Conversion Cycle (CCC)</b>	110.69	121.28	116.37	111.74
<b>ROA</b>	6,30%	7,63%	5,75%	6,69%
<b>Solvency Ratio</b>	1,22	1,21	1,22	1,19



In order to see how rentable is Siemens AG, we carry out a three-axis graph with the ROA, the Cash Conversion Cycle and the Solvency ratio of the last four years of the company. Through all this years they had maintain the same solvency ratio higher than 1, although that good solvency ratios are between 1,5 and 3. But despite this they never had been in a risky situation. The last year they had a lower Cash cycle than the previous years, which is better because the company has to lock up cash for a relatively smaller period of time.

As a conclusion we can say that or company is in a good position as during these four past years it has maintained in the first quadrant, generating profits without showing any important risk.

## 9. VALUE-ADDED

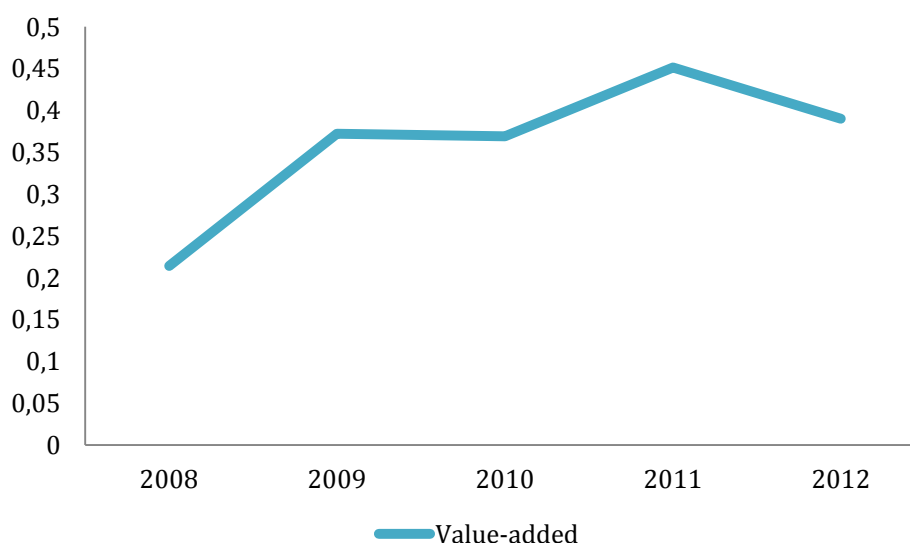
Value added (VA from now on) shows how many EBITDA the company generates per each EUR invested in its employees. At the same time it charges the company rent for tying up investor's cash to support operations. There is a hidden opportunity cost, calculated by VA, which goes to investors to compensate them for forfeiting the use of their cash, normally ignored by the conventional measures of performance.

A positive VA indicates that book value is increasing, which over time will produce a positive shareholder value. A negative VA, indicates that the operations are not profitable enough to support the cost of capital, or that the company has too much capital for its operations.

	2008	2009	2010	2011	2012
<b>Value-added</b>	0,214	0,372	0,369	0,451	0,390

To calculate the value-added by Siemens, we have applied the following formula:

$$\text{Value - added} = \frac{\text{EBITDA}}{\text{Cost of employees}}$$



For 2008 we have obtained 0,214€ as a result, meaning that for every EUR Siemens invested in their employees (monetary unit of wage paid) they got 0,214 EUR of EBITDA. The next three years experimented an increase in its VA until 2012, when sales increased and so did costs and expenses, which led to a decrease of VA by 0,06 monetary units.

## 10. Growth rate

The growth rate is the amount of increase that a specific variable has gained within a specific period and context. For investors, this typically represents the compounded annualized rate of growth of a company's revenues, earnings, dividends and even macro concepts, such as the economy as a whole. Is a model to see how much have growth our company.

$$g = (1 - \text{payout})(1 - \text{tax rate})ROA$$

	2008	2009	2010	2011	2012
<b>Payouts</b>	23%	56%	58%	42%	56%
<b>Tax Rate</b>	35%	37%	29%	24%	29%
<b>ROA</b>	2,6%	6,7%	5,8%	7,6%	6,3%
<b>g</b>	1,31%	1,86%	1,71%	3,36%	1,97%



As we can see in the table, between 2008 and 2009, our growth rate increased a 0,55%, that's because the ROA went up more than a 0,40%, nevertheless payouts and tax rate increased during that period of time but the whole trend indicates an important increase because of the high change on the commented ROA.

Between 2009 and 2010 the analyzed rate decreased from 1,86% to 1,71%, that is because of the decrease of -0,9% of ROA.

But what we should stand out should be the important change of the growth rate in 2011, this was because our ROA goes from 5,8% to 7,6% (increase of 1,8%).

Then, in 2012, the g went down again but its decreasing stopped closer above in comparison with the results of the previous years, without taking into account the high result in 2011.

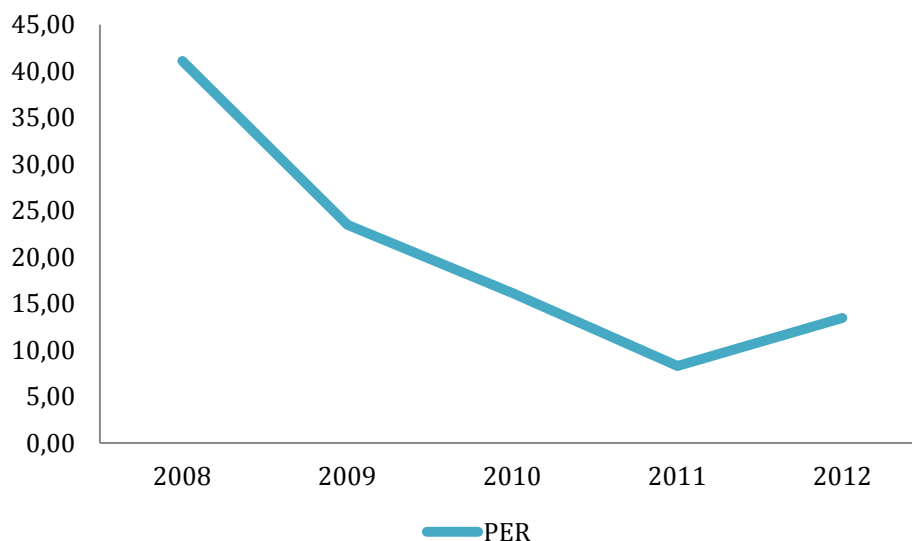
# 11. PRICE EARNING RATIO

The P-E gives you an idea of what the market is willing to pay for the company's earnings. The higher this ratio is, the more the market is willing to pay for the company's earnings. Some investors read a high P-E as an overpriced stock and that may be the case, however it can also indicate the market has high hopes for this stock's future and has bid up the price.

Conversely, a low P-E may indicate a "vote of no confidence" by the market or it could mean this is a sleeper that the market has overlooked.

Investors can use the P-E ratio to compare the value of stocks: if one stock has a P-E twice that of another stock, all things being equal (especially the earnings growth rate), it is a less attractive investment. Companies are rarely equal, however, and comparisons between industries, companies, and time periods may be misleading. P-E ratio in general is useful for comparing valuation of peer companies in similar sector or group.

	2008	2009	2010	2011	2012
<b>EPS</b>	1,60	2,7	4,8	8,23	5,77
<b>Share price</b>	65,75	63,28	77,43	68,12	77,61
<b>PER (in EUR)</b>	41,09	23,44	16,13	8,28	13,45



As we can see, the minimum PER belongs to 2011 with a rate of 8,28% and the highest one belongs to period 2008 with a 41,09%. That's why in 2011 the EPS increased a lot while, in comparison with it, in 2008 was very small.

The price rate has always been fluctuating between 65% to 78% approximately.

And we also have search the PER on the internet to compare with our calculus and we have find a more specific graphic that takes into account the dates monthly. This graphic its from ycharts.com in 24/05/2013.



<b>Minimum ratio</b>	4,641	Oct. 27-2008
<b>Maximum ratio</b>	63,11	Jan. 2-2008
<b>Average ratio</b>	20,37	

We observe that during the last three years, the PER doesn't fluctuate a lot, and has followed a more or less stabilized trend. But during the periods 2008 and 2009, it increase and decrease very heavily. Having, during 2008 the maximum and minimum levels of all the periods analyzed.

# BIBLIOGRAPHY

## BOOKS:

*Gestión Financiera* from Professor Rodrigo La Fuente from Google Books

Siemens Memories

Siemens Annual Reports

## INTERNET:

Siemens Global Website <http://www.siemens.com/entry/cc/en/>

Alstom Website <http://www.alstom.com/>

Bombardier Website <http://www.bombardier.com/>

General Electrics <http://www.ge.com/>

Philips Website <http://www.usa.philips.com/>

Amadeus data base

El Economista: [www.eleconomista.com](http://www.eleconomista.com)

Wikiinvest: [www.wikiinvest.com](http://www.wikiinvest.com)

The Wall Street Journal: [www.wsj.com](http://www.wsj.com)

NASDAQ: <http://www.nasdaq.com/symbol/si/option-chain>

Stock Analysis on Net: <http://www.stock-analysis-on.net/>

Investopedia: [www.investopedia.com](http://www.investopedia.com)

PER analysis [http://ycharts.com/companies/si/pe\\_ratio](http://ycharts.com/companies/si/pe_ratio) (24/05/2013)



