

# ***KNORR-BREMSE(AG)***

Sai Srujana Kadambari  
[sai.kadambari@stud.th-owl.de](mailto:sai.kadambari@stud.th-owl.de)  
 Immatriculation number- 15474049  
 Department of Elektronik und technishe informatic  
 Masters in information technology  
 Technische Hochschule Ostwestfalen Lippe,  
 University of applied sciences and arts Lemgo campus, Germany

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## INTRODUCTION:

For over more than 115 years, Knorr-Bremse is on a single mission to make mobility safer with both commercial and rail systems. A small company based in Munich, Germany, is now a leading manufacturer of safety critical sub systems around the world. As KBC (Knorr-Bremse Company) is represented across the world, it has its presence over 120 locations in 30 countries. All the employees in the company are highly qualified, speak local language, know about the cultural conventions and of country specific product requirements. All the qualities within the company and by valuing each detail of the needs of the customers made KBC special and became a crucial advantage and proximity to the respective markets and customers. KBC entered Frankfurt Stock exchange on October 12<sup>th</sup>, 2018, became Knorr-Bremse AG(Aktiengesellschaft) and Knorr Bremse is in Xetra share market. In 2007 Mr. Heinz Hermann Thiele left the CEO position and became the honorary chairman of KBC and joined the supervisory board. After company entered IPO, Mr. Heinz Hermann Thiele wanted to withdraw more from the activities of the company. Mr. Bernad Eulitz has appointed as the CEO of the company in 2019 but must leave the position by the return of patriarch to the board. Dr. Jan Mrosik the present CEO of KBC is doing his duties since 2021. The whole company mourned due to sudden demise of Heinz Hermann Thiele on 23<sup>rd</sup> February 2021[16,17].

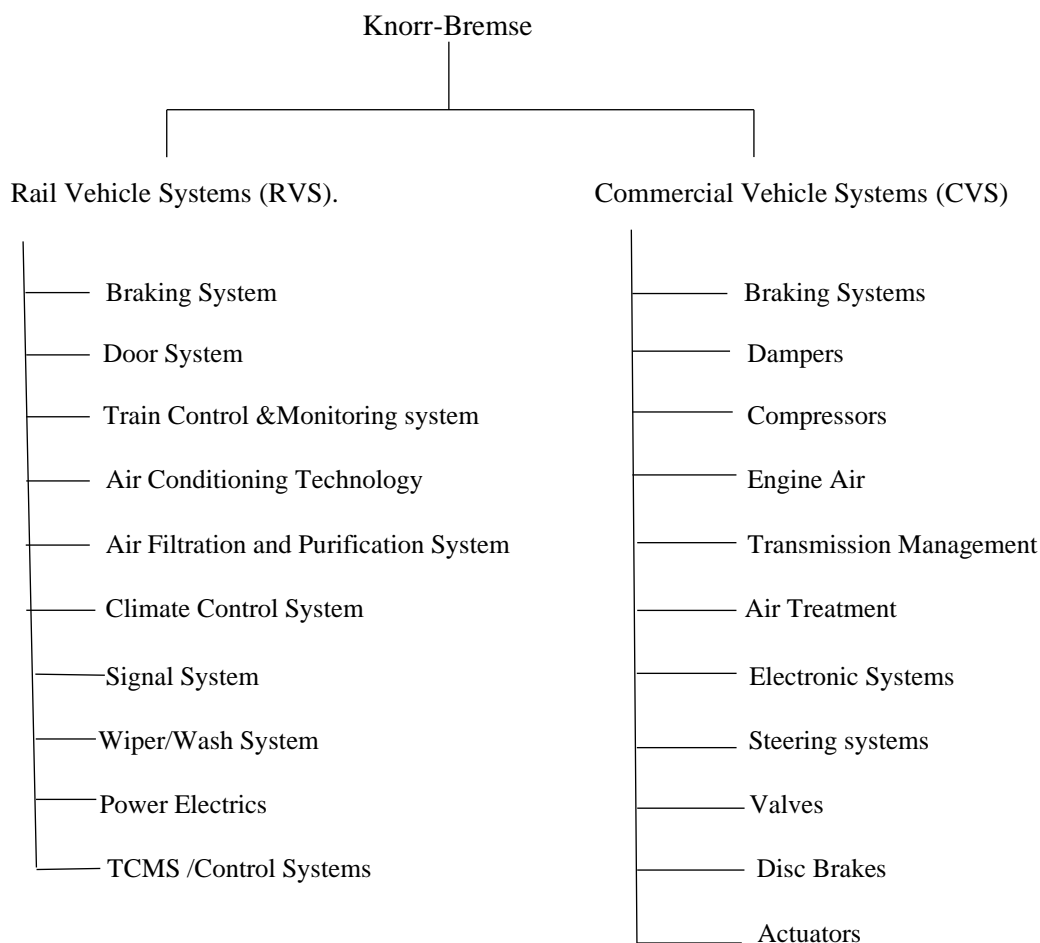
## HISTORY:

Knorr-Bremse (AG) is one of the leading manufacturers of braking systems in both rail and commercial vehicles. KB(Knorr-Bremse) was first started in Berlin in 1905 by George Knorr where its production of railway braking systems are obtained from a company “Carpenter & Schulze”. Later, in 1911 the company is merged with “Continental Bremsen- GmbH” and acquired the current name of Knorr-Bremse. The Initial basis of KB’s commercial success was given by Prussian state railway for supplying single chamber braking system first for passenger and later for freight trains. A compressed air brake ‘Knorr-Druckluft’ along with its derivatives enhanced safety performance compared with traditional systems by KB company. In 1920 manufacturing plant of Bayerische Motoren- Werke AG (BMW) became a subsidiary of Knorr-Bremse in Munich, Germany. Delivering brake systems as Süddeutsche Bremsen-AG for the former Royal Bavarian Railways.

The Second important activity of KB is happened in 1922 where KB moved into pneumatic braking systems. Knorr-Bremse was the first company to develop a system that apply brakes simultaneously to all four wheeled trucks and its trailer. Thus, resulting reduction in braking made an important contribution to improve road safety [2]. During 1921 to 1939 a product called ‘Hilderbrand-Knorr’ braking system becomes the standard in 17 Countries and 90% of all German 7-16 t trucks are equipped with Knorr Bremse systems. In 1945-1953 production of braking system is resumed in West Germany and new headquarters is built in Munich. In the period of 1960-1980 Knorr Bremse product ‘KE control valve’ become UIC (International Union of Railways) standard along with the magnificent achievement Knorr-Bremse entered US market with the AAR DB- 60 valve for rail vehicles [1].

In 1987, by holding 71% stake by Heinz Hermann Thiele, became the CEO of the company. Heinz Hermann Thiele converted Knorr-Bremse into public company and concentrated on pneumatic business (air brakes) [3]. The business was developed by splitting up the legal corporate structure and creation of two divisions which are RVS (Rail Vehicle Systems) and CVS (Commercial Vehicle systems). From 1990 to 2000 Knorr-Bremse created an international production group through subsidiaries and acquisitions. In 1999 Robert Bosch GmbH merged the activities of electronic brake control sector with Knorr-Bremse commercial vehicle systems, where KB company acquired 60% of shares and managerial control. KBC took over NYAB (New York Air Brake) and IFE companies and expanded its footprints. Also, started the large production of pneumatically operated disc brakes for commercial vehicle systems [4,1,5]. From 2000 to present Knorr Bremse took over the companies like





Product Portfolio of Knorr-Bremse Company [11,12]

## BUSSINESS MODEL & MARKET POSITION:

As a business model canvas describes how a business intended to make money, it also explains who the customer base is and how the business is delivering value to its customers.

1. Customer Segments: The companies or customers we are targeting to sell our products. Here, Knorr-Bremse using Concentric Diversification in braking system with different operators and manufacturers. As Knorr-Bremse first started its career with the braking system to trains it also expanded its wings to commercial vehicles, cars and agricultural machinery with safety critical rail and commercial systems. Now, company is following conglomerate diversification technique by producing steering, entrance systems and electrification of vehicles. KBC has service centers to all branded trucks aftermarket which comes to multi sided market.

2. Value Proposition: It is the heart of the business model. Value proposition shows a unique solution to the problems which customers are facing and helps to make business stronger.

As per the requirements and wishes of the customer, KBC is providing its services and products with both customization and good quality. For RVS, KBC offers service, Modernization, spares,

products for more transport capacity Vehicles and eco-friendly systems which are available in different parts of the world.

For CVS, KBC offers service and aftermarket service, interchangeable parts, upgrading vehicles with E-mobility & automated driving. All the services and products by KBC has global service and delivery.

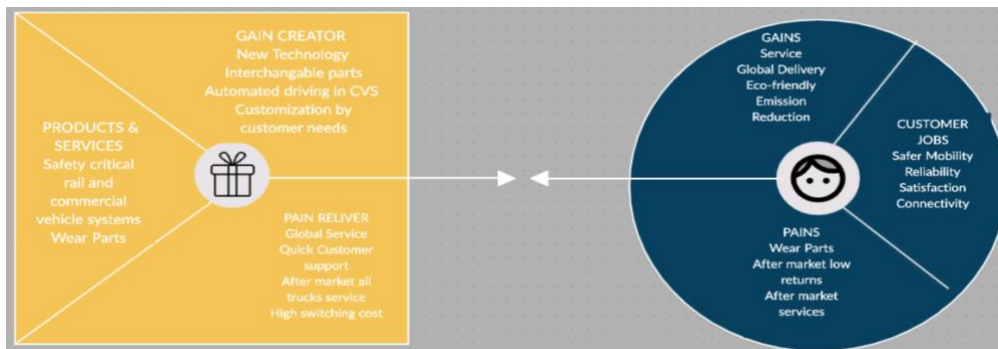


Figure 2 Value proposition canvas

3.Channels: Channels show through how KBC is publicizing its brand and services. KBC is using its website, social media such as Instagram, Facebook, Twitter & LinkedIn. Trade and Financial presses will be released regularly to keep open about their company dealings and products. Trade shows and collaborations are usually done by the company to show how advanced technology they have been using. Customer service and contact forms are the easy ways for the customers to get in touch with the company.

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
1.Strategic partnership with -Electronic, Automotive and well reputed companies Eg- BOSCH 2. Acquisitions Eg- Vossloh Kiepe, Federal Mogul Ind. Property Rights and Hitachi Automotive Systems 3. Service centers partnerships 4. Research and Development on a global basis 5. Rail operators 6. Universities 7. OEM technology Partners. 8. Investors 9. Insurance	1.World wide supply according to norms and standards. 2. Continuously increasing safety and emission standards. 3. Able to offer harmonised products globally. 4.Use of new technology for production and able to solve problems of road traffic and rails operations in an efficient way. Key Resources 1. Raw Material Suppliers 2. Design team 3. Workshops and skilled labour 4. R&D for Technology development 5. Tools and Machinery 6. Finance team 7. Patents 8. Human Resource 9. Logistics 10. Contacts & Contracts	Safety and critical Rail and Commercial vehicle systems. 1. RVS ( Rail Vehicle Systems) a. Modernisation b. Service c.Spare d. Transport Capacity e. Availability f. Eco-friendly 2. CVS (Commercial Vehicle System) a. Service b. Interchangeable and Non-Interchangeable parts c. Wear parts and Service kits d. Traffic safety e. Emission Reduction f. E-Mobility g.Automated Driving h. Connectivity 3. Global Service 4. Global Delivery 5. Safer Mobility 6. Customisation by customer needs.	1.Public- Company image 2.Annuity like Regulated maintenance intervals, Leverages high installed base and 20-30 years long relationship. 3.Strong customer retention (homologation) like high switching cost, IP protection, Focus on safety and quality. 4. World class customer service. Channels Website Customer Service & Contact forms Trade shows Trade & Financial press Social Media TV, Radio & News paper Collaborations Stock trading	1.Concentric Diversification in Braking system by different operators and manufacturers such as: a. Rail b. Truck c. Car d. Agricultural machinery Global OEM (Original Equipment Manufacturers) in both Rail and Truck operations 2. Conglomerate Diversification in Critical safety of roads& trucks and Electrification of vehicle systems. a. Rail operators b. Truck operators 3. Multi sided market in Truck servicing a. Truck owners
Cost Structures		Revenue Streams		
1.Cost of raw materials 2. Depreciation, amortization and impairment 3. operating income and expenses 3. Tax on income 4. R&D for Technology expense 5. Property, Plant & Equipment 6.Inventories 7.Wages and salaries 8.Cash flow in operating activities		1.Rail Vehicle Systems - 45% 2. Commercial Vehicle systems. 3. Earnings by shares- 2.97 euros per share 4. Acquisition of companies has later add on revenues Eg- Acquisition of EVAC group added 17.5 million of revenue by the end of September 2021.		

Figure 3 Business Model Canvas [14,17]

4. Customer Relationships: Knorr- Bremse gives dedicated personal assistance by giving customers world class services, strong customer retention with homologation which means granting approval by an official authority which helps customers with IP protection, high switching cost. For maintain



relationships with customers, KBC provides annuity with payment, and by giving regulated maintenance. KBC also maintaining more than 20-30 years of long relationships with their customers.

5. **Key Partners:** First, customers are the most important partners. Strategic partnerships are made with well reputed companies for increasing their brand value for KBC BOSCH is one of the companies. Acquisitions are made with different companies for increasing market and extending the footprints to various markets than the existing once. Research and development, universities and OEM (Original equipment manufacturers) are most important partners of the KBC because they are for constant improvising of technology and increasing the customer base.

6. **Key Activities:** Worldwide supply of products are done by KBC according to the norms and standards such as (UIC, GOST, AAR, ARA) [14]. They are being able to produce harmonized products globally. Using new technology to solve the problems of road and rail traffic. Continuously increasing the safety and emission standards.

7. **Key Resources:** The main key resources are cast iron and plastic for producing brakes and other products, KBC's encourages local suppliers wherever their plant is located around the world. Best design teams for products and world class workshops are being in Knorr-Bremse for constantly improving their quality. Tools and machinery are also resources for a manufacturing plant. Other resources include insurance, logistics, human resources etc.

8. **Cost Structure:** Cost structure focuses on evaluating and delivering value proposition. They include, cost of raw materials, operating, machinery, inventories. Wages and salaries, tax on expenses and income, R&D technologies and depreciation.

9. **Revenue Streams:** The main sources company is generating its revenue are RVS & CVS, either by following transaction-based revenue or recurring revenue. Mostly, RVS system has been a recurring based revenue. Other sources include shares, the current value of a Knorr-Bremse is 81.04 euros per share (by 24<sup>th</sup> February 2022) and Knorr Bremse gets 2.0-3.9 euros per share. Acquisition of different technology companies later adds the benefit, Knorr Bremse got benefited by 17.5 million euros by acquisition of EVAC [22].

## MARKET POSITION:

The current share value of Knorr Bremse is 79.92 euros (February 27, 2022). The main competitor to the Knorr Bremse is WABCO and Knorr Bremse stood 1<sup>st</sup> in the market position having their market around the world. In braking system KBC stood 1<sup>st</sup> in Europe and American market.

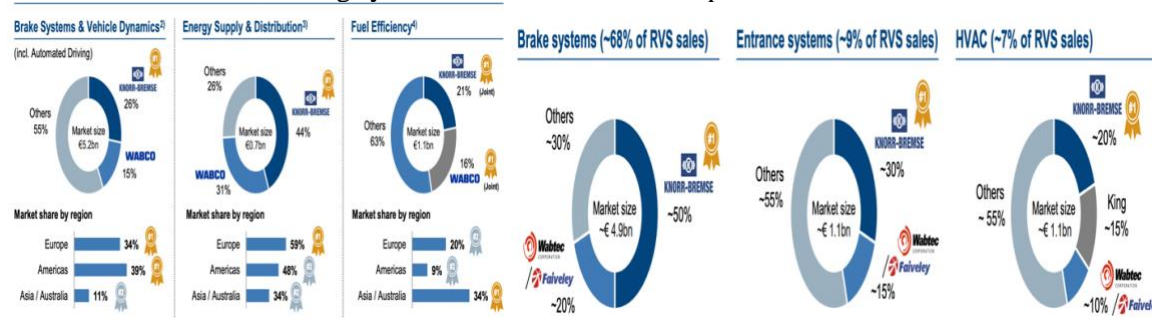


Figure 4 Global Market in both CVS & RVS [14]

## BALANCE SHEETS, FINANCIAL SITUATION:

According to Preliminary Financial results of year 2021, Knorr Bremse released their balance sheets of the company on 24<sup>th</sup> of February 2022 and are shown below in figures 7 & 8[24]. Due to Covid pandemic company sales went down slightly but the overall revenue was generated and is higher than the 2019. Revenue decrease in both CVS and RVS systems reduce in the year of 2020 is shown below

## Revenue for Group, RVS & CVS FY/20

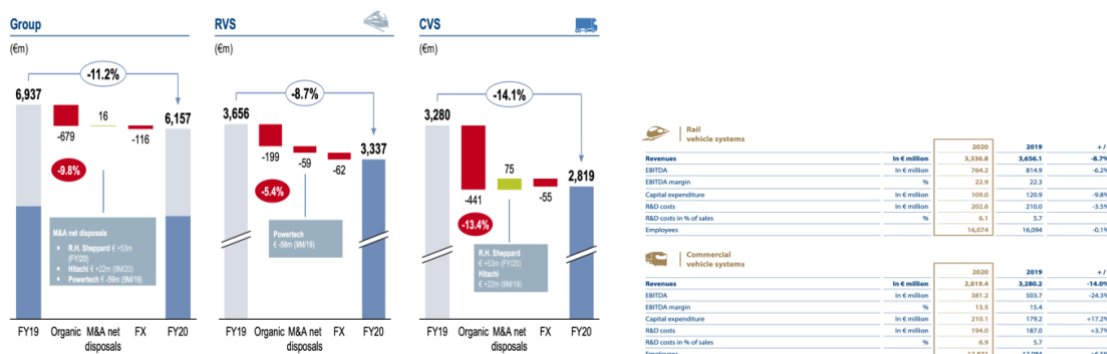


Figure 5 Revenue in 2020 of Knorr Bremse [17,13]

After gradual decrease of covid situation company again started to make more revenue and sales gradually in the year 2021. Fig.6 explains the revenue, order intake and earnings of both divisions CVS and RVS individually.

Divisions:	Full Year			Fourth Quarter		
	2021	2020		2021	2020	
	EUR million	EUR million	A	EUR million	EUR million	A
<b>RVS</b>						
Order intake	3,470.7	3,485.1	(0.4%)	1,261.0	1,095.2	+17.0%
Revenues	3,317.0	3,336.8	(0.6%)	857.3	774.2	+10.7%
EBITDA	718.4	764.2	(5.0%)	186.9	196.1	(4.7%)
EBITDA margin	21.7%	22.9%	(120 bp)	21.8%	25.3%	(350 bp)
operating EBITDA margin	22.0%	22.9%	(90 bp)	22.7%	25.3%	(260 bp)
EBIT	587.7	636.6	(7.7%)	147.9	164.6	(10.2%)
EBIT margin	17.7%	19.1%	(140 bp)	17.2%	21.3%	(410 bp)
operating EBIT margin	18.1%	19.1%	(100 bp)	18.2%	21.3%	(310 bp)
<b>CVS</b>						
Order intake	3,618.0	2,954.2	+22.5%	968.3	991.6	(2.4%)
Revenues	3,390.2	2,819.4	+20.2%	840.8	793.2	+6.0%
EBITDA	500.6	381.2	+31.3%	100.8	121.4	(16.9%)
EBITDA margin	14.8%	13.5%	+130 bp	12.0%	15.3%	(330 bp)
operating EBITDA margin	14.8%	13.5%	+130 bp	12.0%	15.3%	(330 bp)
EBIT	361.1	235.1	+53.6%	62.5	77.2	(19.0%)
EBIT margin	10.7%	8.3%	+240 bp	7.4%	9.7%	(230 bp)
operating EBIT margin	10.7%	8.3%	+240 bp	7.4%	9.7%	(230 bp)

Figure 6 Key figures of 2020 & 2021 in both CVS and RVS [25]

## Balance sheet / assets

BALANCE SHEET		2020				2021			
€m		31.03.2020	30.06.2020	30.09.2020	31.12.2020	31.03.2021	30.06.2021	30.09.2021	31.12.2021
<b>Assets</b>									
Intangible assets and goodwill		858.8	896.2	888.5	887.8	899.2	967.5	986.9	1,005.8
Property, plant and equipment		1,437.2	1,490.0	1,479.5	1,544.7	1,589.1	1,611.6	1,618.1	1,794.6
Investments accounted for using the equity method		16.6	17.8	17.7	24.7	24.2	23.0	23.0	22.1
Other financial assets		52.5	57.8	59.9	140.8	164.9	212.8	195.9	215.2
Other assets		70.5	52.3	54.9	57.3	75.9	74.9	75.3	79.1
Income tax receivables		1.9	0.0	0.0	0.0	1.0	1.0	1.7	1.0
Assets from employee benefits		30.5	29.8	38.4	21.0	22.2	29.0	22.0	30.1
Deferred tax assets		118.8	123.9	122.8	116.4	117.0	120.0	126.5	133.8
<b>Non-current assets</b>		<b>2,586.7</b>	<b>2,667.8</b>	<b>2,661.6</b>	<b>2,792.6</b>	<b>2,893.4</b>	<b>3,039.8</b>	<b>3,049.6</b>	<b>3,281.6</b>
Inventories		865.4	933.2	904.2	844.6	927.7	956.4	1,009.4	1,002.2
Trade accounts receivable		1,353.6	1,411.6	1,427.7	1,141.1	1,519.5	1,536.4	1,424.8	1,230.3
Other financial assets		58.2	41.5	52.0	39.8	71.5	71.7	38.7	63.8
Other assets		128.7	167.0	172.5	161.8	113.7	120.2	138.0	130.6
Contract assets		91.7	91.4	91.3	84.2	88.8	93.4	83.7	75.0
Income tax receivables		68.9	61.3	43.8	48.7	33.8	36.9	41.5	55.5
Cash and cash equivalents		1,983.7	2,293.2	2,131.6	2,277.0	1,989.3	1,502.0	1,640.6	1,380.2
<b>Current assets</b>		<b>4,550.2</b>	<b>4,999.2</b>	<b>4,823.1</b>	<b>4,597.3</b>	<b>4,744.4</b>	<b>4,316.9</b>	<b>4,376.6</b>	<b>3,937.6</b>
<b>Total assets</b>		<b>7,136.9</b>	<b>7,667.1</b>	<b>7,484.7</b>	<b>7,390.0</b>	<b>7,637.8</b>	<b>7,356.7</b>	<b>7,426.2</b>	<b>7,219.2</b>

Figure 7 Balance sheet of assets in 2021 of Knorr Bremse [24]

By Figure.6, CVS division increased its sales and revenue than RVS with an increase of 29.2% of order intake in CVS market, RVS has seen both order intake and revenue with 0.4% and 0.6% decrease than 2020. When comes global market Knorr Bremse took 50% of share in RVS and 26% of share in CVS. Overall, in the global market Knorr Bremse stood in the 1<sup>st</sup> position with 2.8 billion sales in 2020. In the year 2021, even though RVS market has reduced its demand in China (Asia) there is an increase of 6% in the revenues from Q4 of 2020 to Q4 of 2021. The theme of Knorr Bremse in 2021 is "Driving Digitalization". The target 2021 of Knorr Bremse was achieved with 13.6% of EBIT margin according to their reports [24]

## Balance sheet / liabilities

€m	2020				2021			
	31.03.2020	30.06.2020	30.09.2020	31.12.2020	31.03.2021	30.06.2021	30.09.2021	31.12.2021
<b>Equity</b>								
Subscribed capital	161.2	161.2	161.2	161.2	161.2	161.2	161.2	161.2
Capital reserves	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
Retained earnings	34.2	34.2	34.2	13.3	13.3	13.3	13.3	13.3
Other components of equity	-233.5	-272.2	-305.7	-317.6	-241.4	-247.2	-250.9	-196.2
Profit carried forward	1,754.5	1,464.3	1,464.3	1,464.3	1,959.8	1,714.8	1,714.8	1,714.8
Profit attributable to the shareholders of Knorr-Bremse AG	134.4	237.1	369.2	495.5	169.1	333.3	479.2	624.3
<b>Equity attributable to the shareholders of Knorr-Bremse AG</b>	<b>1,864.6</b>	<b>1,638.5</b>	<b>1,737.0</b>	<b>1,830.7</b>	<b>2,076.0</b>	<b>1,989.2</b>	<b>2,131.5</b>	<b>2,331.4</b>
Equity attributable to non-controlling interests	121.7	103.0	103.0	91.0	101.1	100.0	90.6	97.2
thereof share of non-controlling interests in net income	7.5	19.9	28.3	36.7	7.2	12.8	16.9	26.1
<b>Equity</b>	<b>1,996.3</b>	<b>1,741.5</b>	<b>1,840.1</b>	<b>1,921.7</b>	<b>2,177.1</b>	<b>2,089.2</b>	<b>2,220.0</b>	<b>2,428.5</b>
<b>Liabilities</b>								
Provisions for pensions	301.3	347.8	362.1	354.9	296.6	330.5	327.6	312.1
Provisions for other employee benefits	22.2	19.8	20.9	17.4	18.6	17.4	18.7	21.7
Other provisions	262.0	270.7	270.2	269.0	277.7	262.8	253.1	227.8
<b>Financial liabilities</b>	<b>1,663.1</b>	<b>1,657.8</b>	<b>1,642.9</b>	<b>1,158.7</b>	<b>1,203.7</b>	<b>1,216.9</b>	<b>1,211.3</b>	<b>1,296.1</b>
Other liabilities	5.1	3.4	2.5	3.5	5.3	4.2	4.3	3.9
Income tax liabilities	51.6	52.6	59.8	59.2	63.7	67.1	71.4	79.8
Deferred tax liabilities	85.9	94.7	97.0	114.5	135.4	135.4	147.3	151.9
<b>Non-current liabilities</b>	<b>2,391.3</b>	<b>2,446.8</b>	<b>2,455.5</b>	<b>1,976.2</b>	<b>2,001.0</b>	<b>2,034.5</b>	<b>2,033.6</b>	<b>2,093.3</b>
Provisions for other employee benefits	22.4	21.7	19.9	19.2	20.4	20.4	18.9	7.9
Other provisions	193.6	202.4	200.2	194.0	191.9	193.3	195.4	240.7
Trade accounts payable	978.0	946.2	959.0	1,027.7	1,166.4	1,175.1	1,112.5	1,166.1
<b>Financial liabilities</b>	<b>1,170.8</b>	<b>1,859.8</b>	<b>1,992.2</b>	<b>1,818.2</b>	<b>1,646.5</b>	<b>1,395.9</b>	<b>1,411.8</b>	<b>852.4</b>
Other liabilities	91.2	109.3	83.8	90.3	88.0	102.8	86.0	102.0
<b>Contract liabilities</b>	<b>274.1</b>	<b>293.2</b>	<b>283.1</b>	<b>295.9</b>	<b>294.0</b>	<b>284.8</b>	<b>283.5</b>	<b>285.6</b>
Income tax liabilities	29.1	46.2	50.9	46.8	52.5	61.1	62.5	62.7
<b>Current liabilities</b>	<b>2,759.3</b>	<b>3,478.8</b>	<b>3,169.2</b>	<b>3,492.1</b>	<b>3,459.7</b>	<b>3,233.0</b>	<b>3,170.6</b>	<b>2,697.3</b>
<b>Liabilities</b>	<b>5,150.6</b>	<b>5,925.6</b>	<b>5,644.6</b>	<b>5,468.3</b>	<b>5,460.7</b>	<b>5,267.5</b>	<b>5,204.2</b>	<b>4,790.7</b>
<b>Total assets</b>	<b>7,136.9</b>	<b>7,667.1</b>	<b>7,484.7</b>	<b>7,390.0</b>	<b>7,637.8</b>	<b>7,356.7</b>	<b>7,426.2</b>	<b>7,219.2</b>

Figure 8 Balance sheet of Liabilities in 2021 of Knorr Bremse [24]

Figures 7 & 8 are the balance sheets of both assets and liabilities of Knorr Bremse in year 2021 and there is a slight decrease in total assets and liabilities when compared to 2020. Covid situation will also continue in 2022 and the situation is explained by Knorr Bremse as shown below.

### Covid-impact still visible but positive market outlook for rail and truck in 2022



Figure 9

Overall, Significant 13.1 % received in orders received of EUR 7.3 billion. With approximately EUR 5.6 billion in orders on books. Free cash flow of EUR 600 million at year end and cash-conversion ratio of 92.3 %. With revenue between EUR 6.8 billion and EUR 7.2 billion, an operating EBIT margin between 12,5 % and 14.0 % and a free cash flow between EUR 500 million and EUR 600 million, Knorr Bremse is a strong company with strong financials [25]. The maximum share value of Knorr Bremse is 92.86 euros and dividend paid by the company in 2020 was EUR 245 million and 1.52 euros per share [26].

## COMPANY STRATEGIES:

Knorr Bremse strategies are so clear, the company wants to grow bigger by capturing every opportunity. Attracting customers with new technology and continuous improvement of the existing technology is the main attractive point of KBC.

1. Business Strategy: Knorr Bremse is following two business strategies; both are used to expand their business in a global level. They also include internalization by of the business.
  - a. Capturing Megatrend opportunities.
  - b. Leverage Global Presence. (Internalization)
- Targeting most populated urban areas like India and China helps to expand their business to Asia and helps in "Internalization". Indian Railway Services (IRS) is a large market in India and one of the top customers of Knorr Bremse, 4% sales of Knorr Bremse in 2019 are to IRS. Almost 15% of sales of KBC are from China Railway Rolling Stock Corporation (CRRC). KBC is providing its OE to these both countries increased their market and brand value.



Another company which is so important to KBC is “Bombardier”, it is a Canadian jet company and has 8% sales of KBC to it. KBC has its global footprints around the world by dealing with each continent. When comes to CVS market PACCAR, VOLVO and ISUZU 13%, 10% and 3% sales form KBC in the year 2019.

Figure 11 & 12 explains KBC’s position in global market and how it stood in top positions when compared to its competitors. Knorr Bremse is situated more than 120 locations around the world.

## Clear vision for future value creation



Figure 10 Strategies of Knorr Bremse [14]

2. **Transformational Strategy:** KBC is trying to expand technology leadership. Acquisitions of companies with new technology also helped the growth and some of the companies include Vossloh Kiepe, TRS, Ted drive steering system, TMD friction, Icer Rail, Haldex, GT group [27] helped Knorr Bremse to increase its revenue and a step forward in expansion of combined technologies with the OE of KBC. Some of the important technological strategies KBC wants to follow are:

- a. Combined Braking and Steering system in CVS.
- b. Automated Driving in CVS.
- c. Digitalization in RVS.

By transforming the existing technology into new once which are quite efficient and environment friendly Knorr Bremse is attracting new customers [14]. For new technology Knorr Bremse invests more in R&D and tie with new startups and universities.

3. **Operational Strategy:** The strategies used by Knorr Bremse during and after production of their products are:

- a. Continuous efficiency and excellence
- b. Growth after market strategy
- c. Climate strategy

Knorr Bremse is trying to continuously improve their quality and efficiency of the equipment they are producing. Recently KBC is concentrating more on carbon reduction and fuel efficiency. Because of the quality products produced the percentage of returns of the Knorr Bremse equipment is 37%, the share of RVS is 45% and CVS is 27%. With high after market returns the customers are showing more interest in KBC. Also producing products with less carbon emissions and works with renewable energy resource [30].

**SWOT analysis:** Due to covid pandemic situation the supply chain of KBC has becomes its weakness, due to weak supply chain the global market went down. Detailed Strength-Weakness-Opportunities- Threat analysis has explained below.

## Knorr-Bremse SWOT Matrix / Weighted SWOT Analysis

	Opportunities	Threats
<b>Strengths</b>	<b>Strength Opportunities (SO) Strategies</b> Leveraging brand recognition in new segments	<b>Strength Threats (ST) Strategies</b> Investing into R&D to thwart Transportation industry disruptors.
<b>Weaknesses</b>	<b>Weakness Opportunities (WO) Strategies</b> Investing into customer oriented services and supply chain	<b>Weaknesses Threats (WT) Strategies</b> Get out of the business and focus on growth areas

Figure 11 SWOT Analysis of Knorr Bremse [28]

- Strengths- “First mover advantage in railroad industry, Diverse revenue models with both RVS & CVS, Large geographic presence, Services to different customers segments within Railroads segment, success of new technological innovations and Track record of innovation.” [28]
- Weakness- “Gross margins and operating margins, Business model, Low investments into Knorr-Bremse's customer-oriented services, Niche markets and local monopolies, High cost of replacing existing experts, Declining market share.” [28]
- Threats- “Changing political environment, Trade Relation between US and China, Competitors catching up with the product development, Competitive pressures, Distrust of institutions, Changing demographic.” [28]
- Opportunities- “Local Collaboration, increasing government regulations, increasing customer base in lower segments, lower inflation rate, accelerated technological innovations and advances, opportunities in online Space.” [28]

## EMPLOYER BRANDING STRATEGY:

By setting some policies and doing services Knorr Bremse is branding its image to its public. They are as follows:

Human resources policy and code of conduct Knorr Bremse is attracting its employs and customers with Rights and Policies to employs. [29]

All the employs who are working at Knorr Bremse have certain rights such as:

1. Respect to personal dignity and privacy of personal data.
2. Health support and safety in working environment.
3. Ban on discrimination and protection against harassment.
4. Freedom of expression
5. Ban on child labor and forced labor.
6. Good remuneration for and working time.
7. Employ rights such as wage bargaining.

In addition to it Knorr Bremse set their goal of gender equality which they are advertising more in social media. Knorr Bremse made Gender equality as sustainable development goal.

With all the above rights Knorr Bremse is attracting all the employs. Similarly, there are certain policies and values of Knorr Bremse which are followed with business partnership, suppliers and with customers. [29]

1. Doing business with a fair competition.
2. Ban of corruption and bribery
3. Avoiding conflicts of interest and treating everyone equally.
4. Protection of company property and confidentiality.

5. Product safety and quality
6. Export control
7. Climate and environment protection
8. Social commitment

With the above values customers and suppliers will choose Knorr Breme and trust them with their business.



Figure 12 Sustainable development goals of Knorr Bremse [14]

### Awards & Ratings :

Knorr Bremse is branding itself with all the awards and ratings it's got for its excellent work it like, Top employer in a 5<sup>th</sup> row, Supplier sustainability awards in 2014, Industrial sustainability supplier 2015, green award in 2018. Some of the ratings to KBC are Sustainalytics gave 18.9, S&P global rating is 52, ISS ESG is C+, MSCI ESG rating is A and CDP disclosure rating is A-. [30]

The above figure 14 shows some of the goals of Knorr Bremse and it is branding its company with those goals. Some of the main goals are gender equality, decent work and economic growth.

### Support to Education, Health, Social cohesion & Environment by Knorr-Bremse:

The total donations by Knorr Bremse in the year of 2020 is 4.5 million euros. [23] Knorr Bremse is helping environment and people by conducting several projects around the world. Projects of Knorr Bremse are

- Asia/ Australia- Environment and Climate protection, beach and countryside projects, office waste reduction project in Dalian, Nankou in China, Hongkong. Funding scholarships and supporting low-income families, extension of school building for allowing more children (India). Supporting autistic, blind children. Donating clothes, food and school materials for poor families. Building Soup kitchen in Australia for poor. [23]
- Europe/ Africa- Preservation of forest in Liberec, Tree planting and giving funds for saplings in UK and Italy. Financing cancer organization and ambulance purchase in Germany, Italy, Hungary. Educational games for socially disadvantaged children and school material for children in France, Austria [23].
- America: Pollinator Garden for bees, beach cleans ups and financing nature conservation organization. Finance support to Dementia, Alzheimer, Heart health organizations. Car oil change for single mothers, Thrift stores to fund houses, food banks for low-income families. Construction of playgrounds, giving scholarships and financing local universities [23].

By all the above policies and branding its image, Knorr Bremse is standing as one of the top global companies ranking 1182 globally in 2021 by Forbes [31]. A German based company which manufactures brake systems is now one of the best competitors globally of their OE products.

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