

Report On
**“Multiple Valuation method: Difference between Market Price
& Implied share price of USA’s Machinery – Construction &
Mining Industry”**

By

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Student ID: 17204089

An internship report submitted to the Brac Business School in partial fulfillment of the
requirements for the degree of
Bachelor of Business Administration

Brac Business School
Brac University
June 2021

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Declaration

It is hereby declared that

1. The internship report submitted is my/our own original work while completing degree at Brac University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

Student's Full Name & Signature:

Sajid Shariar
17204089

Supervisor's Full Name & Signature:

Sohana Wadud Ahmad
Lecturer, Brac Business School
Brac University

Letter of Transmittal

Sohana Wadud Ahmad

Lecturer,

BRAC Business School

BRAC University

66 Mohakhali, Dhaka-1212

Subject: **Submission of Internship Report**

It is a great pleasure for me to inform you that I have successfully completed my internship report, titled with “Multiple Valuation method: Difference between Market Price & Implied share price of USA’s Machinery – Construction & Mining Industry”. This report has been completed by the knowledge gathered from my undergraduate journey and my internship experience. I have tried my level best to complete this paper as meaningful and insightful as much as possible. I would like to thank you so much for your constant support and guidelines. Without your inspiration and guidance, it becomes impossible for me to complete this task. I am now placing my report for your kind evaluation.

Lastly, again I express my gratitude to you, and hopefully, your prudent comment on this will inspire me to do a bigger task in the future and make the necessary corrections. I believe this report will meet your expectations. Sincerely yours,

Sajid Shariar

ID: 17204089

BRAC Business School

BRAC University

Date: June 05, 2021

Non-Disclosure Agreement

[This page is for Non-Disclosure Agreement between the Company and The Student]

This agreement is made and entered into by and between Bangla Trac Ltd (BanglaCAT) and the undersigned student at BRAC University Sajid Shariar, ID: 17204089

Acknowledgement

First of all, I would like to give my heartiest gratitude to almighty Allah to keep me safe and sound. By the grace of Allah (SWT), I can successfully complete my report. I would like to express my sincere gratitude to my internship supervisor, Sohana Wadud Ahmad miss for her valuable suggestions, feedbacks and guidelines to prepare this report. She has been gracious enough to spare time out from her busy schedule for giving me all the necessary assistance throughout the entire period of the report writing time. Without her help, this report might not have been a comprehensive one. I also like to give a special thanks to my onsite supervisor Md. Mamunur Rahman Khan and Mr Habibur Rahman. They were kind enough to provide me the necessary information to make my report as a meaningful one. Finally, I am really thankful to everyone who have motivated me, shared necessary information and provide feedback on my work.

Executive Summary

The journey of undergraduate life ends with submitting this internship report. I have learned so many concepts, theories, and methods throughout the whole journey but was unaware of the practical implementation of my knowledge. However, the internship is such an opportunity where one can implement his knowledge in the practical field. I have done my internship at BanglaCAT, and from there, I get the opportunity to acquire some practical experience. From there, I get some basic idea about how the corporate world really runs. However, I have written this report based on my financial knowledge. Since I have done my Internship in HR, but I find finance more interesting over it. Because of the strict privacy policy and lack of financial information of BCAT and its competitors, I forced to work with the parent company of BCAT like Caterpillar. I have used the multiple valuation models in this report to find out the implied share price of Caterpillar and compare it with the market price. Also, I have done the trend analysis of its competitors. From there, I have found that CAT has the tendency to overvalue its Stock, where most of its competitors follow the undervalued policy to sustain in the stock market. Then, I tried to show the impact of the COVID outbreak on the mining & constructions industry of the USA. Finally, in the recommendation side, I gave some advice to the investors and tried to showcase the pros & cons of overvalued and undervalued stocks. Also, I have mentioned that, before investing in any stock what the investors should check.

Keywords: BanglaCAT, Multiple Valuation, Caterpillar, COVID, Practical experience.

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List of Acronyms

BCAT - BanglaCAT

LBA - Large Business Account

PPD - Public Procurement Department

CAT – Caterpillar

TEX - Terex Corp

HEES - H&E Equip Services

MTW - Manitowoc Company

ASTE - Astec Inds Inc

Chapter 1: Overview of Internship

1.1 Student Information

Name: Sajid Shariar

ID: 17204089

Program: Bachelor of Business Administration

Major: Finance & Human Resource Management

1.2 Internship Information

1.2.1 Company Name: Bangla Trac Ltd (Bangla CAT)

Department: Human Resource Management

Address: House # 68, Road # 11, Block # H, Banani, - 1213 Dhaka.

1.2.2 Internship Company Supervisor's Information

Name: Md. Mamunur Rahman Khan

Position: Manager, HR (Operation, PMS & Compensation)

1.2.3 Job Scope

BanglaCAT is considered one of the most prominent and dominant companies in Bangladesh. It is a very well-known name in the construction industry of Bangladesh. I considered myself privilege and honoured to get the opportunity to work for BanglaCAT as an Intern in the Human Resource Department. The job responsibility of the Intern in BCAT has been unique in its way. I have learned practically how the HR department functions in the company as the company gave me exposure to do HR-related works. HR department's work is very much undervalued in the organization. However, the role of the HR department is very much significant in the smooth operation of the company. From my experience, I have seen that the HR department

not only helps the company to achieve its objectives but also it helps the company to achieve a sustainable advantage among the other competitors in the industry. My job role has been guided by various policies of the company such as recruitment policy, selection process & new employee orientation and induction of the company. I have worked with the HR department to finalize the budget of the recruiting personnel for the filling the vacant positions of the company according to the demand requirement of the various department of the company. I have also prepared a list of prospective candidates from the central database of Bangla CAT HR, where the Curricular Vitae of the promising candidates is stored with filtering. Right after this, I was assigned to report to the concerned department heads with the promising CVs of the candidates. It should be noted that my line manager supervised me throughout the process of filtering the CV of the promising candidates. Moreover, during the selection process, I was assigned to moderate the recruitment tests and help the candidates with answering any kind of questions from them. After this, I was given the responsibility to contact with the shortlisted candidates and help the HR department with the interview process. Lastly, I was assigned with induction of the new employees to the company with the help of my line manager and collecting the necessary documents & record them in the database of the company for the further process of the company. It should be noted that for the Covid-19, all the necessary precautions were followed by the company during this process. Overall, my job role during my internship with the company provided the practical knowledge of the HR functions of the company, which are necessary for finding the right persons for the company.

1.3 Internship Outcome

1.3.1 My Contribution to the Bangla CAT

Bangla CAT has been considered as one of the largest and renowned companies in Bangladesh. Its reputation in the construction industry has been remarkable. BanglaCAT provides ample opportunity for its employees to contribute to the company. During my internship period with Bangla CAT, I have got sufficient opportunity to have my mark in the company. I was assigned to the HR department as an intern, where I need to assist the HR department in the company's daily activities. I have been involved in their recruitment process, which started with the budget approval from the Finance department and conducting the demand analysis of the manpower among the various department of the Bangla CAT. After this, I have assisted in filtering the

CV of the potential candidates from the company's central server, where they have stored the CV of the various candidates.

Moreover, I have also assisted in calling the potential candidates and conducting recruitment exams of the potential candidates. It was a learning experience as I have practically experienced the operations of the HR department. Adding to this, I have been involved in selecting the potential candidates for the final interview with the help of my line manager and inviting them for the final interview. Lastly, I have been involved in introducing the new employees to the company and collecting the relevant papers to store the data for further assistance. I have also been involved in recording the data for the HR department in the purpose of Health Insurance, Performance Bonus and other purposes as per the need of the company. The overall contribution to the company from my side has been largely assisted by the line manager of the company. By getting proper guidance, I have successfully made my contribution to the company and learned how HR functions in the company, which will be helpful for my future career.

1.3.2 Benefits to Students:

There are different benefits that students can get from my internship report on Bangla CAT. The benefits are given below:

- **Understanding Corporate Culture:** Through this internship program, a student can understand the corporate culture of the workplace and implement these learnings in their future job opportunities. For example, a student can learn the work ethics and behavioural aspects of the corporate job world through this internship program and have an overall idea of the corporate work culture, which will help shape the future job performance of the student.

- **Understandings of the HR Operations:** As I have completed my internship in the HR department, so I have tried to provide my learnings in this report. Through this report, one student can learn the practical implementation of HR operations and can match their learnings with the HRM courses. This will help the students to understand the principles of HR in a more defined way, and they can also enrich their learnings which will be helpful for their future career.

- **Understanding New Workplace Environment during COVID-19:** Covid-19 has reshaped the workplace environment in a large way. The workplace environment of the corporate world has not been the same anymore like previous times. The introduction of the "Work from Home" has impacted the workplace environment drastically. During my internship with the Bangla CAT, I had to do office both from my home and physically attending the office. The importance of the online meeting platform like Zoom, Google Meet has been remarkable nowadays for the impact of Covid-19 around the world. The students from this report can easily understand the importance of the latest technology in workplace environment. At this time, the company focuses more on these skills during the recruitment period as these are important in the company's day-to-day activities. In my paper, I have tried to showcase the importance of these skills, including communication skills, for better placement of the students. From this, the students will be motivated enough to learn about the latest technology and have an edge in the corporate culture during their internship with the respective company.

- **Importance of Communication Skills:** Importance of the communication skills in HR operations has been remarkable. Without having proper communication skills, one can not have success in the HR department. In my paper, I have tried to provide the importance of the communication skills which are necessary for every aspect of the company. From my paper, they will easily understand the importance of communication skills which will help in their career.

1.3.3 Difficulties faced during the internship period:

In the office BCAT conducts vast paperwork. Sometimes it becomes very tough to maintain a massive bulk of paper, and for me, it's become very difficult to find any important document. In BCAT, the HR department basically depends on the physical work. As a result, during the pandemic situation, I need to attend the office physically. Though BCAT took all the precautions to ensure their employees' safety, but it seems risky for me to physically go to the office. Except for those things, I have experienced a very smooth journey at BanglaCAT.

Chapter 2: Organization Part: Overview, Operations and a Strategic Audit

2.1 Introduction

2.1.1 Objective:

The primary objective is to portray the BCAT's organizational structure and how all of its division functions. Though BCAT is one of the largest companies, many people might not properly know about their product offerings because of their less promotional activity. For them, I tried to list down their product mix and showed the competitive analysis. Also, in this part my aim is to show its SWOT analysis and marketing mix. There I tried to link how the economic growth of Bangladesh can manipulate this industry.

2.1.2 Methodology:

The information of these report is being collected from various sources. For this segment, I have collected data from both primary and secondary sources.

Primary Source: To collect the internal information, I have interviewed my on-site supervisor and some of his colleagues. As this company follows a strict policy regarding the safety of their data, I have no other choice than to take their physical interview. I came to know about the organizational structure, management practices, accounting practice, and financial practices from them.

Secondary source: I also used secondary sources to complete this study. To collect about the information of their product line, historical background etc. I was very dependent on the secondary sources. To get more information, I have explored so many research papers, articles and journals.

2.1.3 Scope:

The scope of this report is comprehensive. This report shows the reader a clear picture of BCAT's operational structure and financial condition. From there, the reader may also know about the practices initiates by this company. This study may help the reader in their further research on the constructions and mining industry or their academic purposes.

2.1.4 Limitations:

To collect the data I have faced many challenges which are -

1. For the consistent lockdown from the government forced the company to shut their office down. As a result, I could not go to the office for a long time and collect the necessary data timely. It causes a delay to start my report.
2. The availability of information for this company is very inadequate. BCAT follows a strict privacy policy. As a result, I faced difficulties with collecting authentic information.
3. This is for the first time I have worked in the corporate sector. So, coping with the new environment and organizational culture, it took some times.

2.1.5 Significance of the study:

This study showcases the reporting structure of BCAT and their organizational culture. Also, from there, one can understand about the benefit of technological advancement. However, these studies reveal what makes the BCAT unique from its competitor. These studies help the readers to know more about the corporate functions, and they can also implement those knowledge in their corporate life.

2.2 Company Overview:

2.2.1 About Bangla Trac Ltd. (BanglaCAT)

Bangla Trac Limited (BTL) is a private company limited by shares and registered in Bangladesh under the Companies Act, 1994 on October 2 2004, bearing the registration number C-54436 (1122)/04. Bangla Trac Limited (conducting business under the name 'Bangla CAT') was appointed as a Caterpillar Engines & Equipment dealer in Bangladesh on October 11, 2004. It is the only Authorized Dealer of Caterpillar INC USA in Bangladesh.

BanglaCAT is the sister concern of Bangla Trac Ltd. Its inception has proven itself the most significant power generation and infrastructure Development Company in Bangladesh. However, In the Bangladeshi industrial sectors, this company is the sole provider of power generation solutions. This company is also listed as the top five Caterpillar EPG dealers in the Asia Pacific and the largest Gas Engine dealer globally. This company is committed to providing the best quality services and facilities to their customs and building long-term professional relationships. The management of BanglaCAT come up with more than three decades of experience in the marketing of CAT® products in Bangladesh. Their ability to

produce a wide range of energy-generating goods increases their brand identification in the industry. Headquarter of this company is in Banani, Dhaka, and branch offices in Chittagong, Ashulia and Vulta, and the sites office in Sylhet, Sidderganj and Mawna. From there, the company is operating its business and provide services to its clients.

The rising number of workers, who had a modest start of 100 and now have more than 500 active full-time worker, of whom 300 are engineers, is a crucial factor in achieving the company's aims. BanglaCAT is now Bangladesh's largest independent energy generation supplier. In Bangladesh, CAT® generators are equivalent to over 35 per cent of the national electrical grid generation. This company is also a market leader in material handling, earthmoving, mining, marine propulsion, and power generation. In the pharmaceutical, steel, agricultural, food and beverage, chemical, ready-made (RMG) and building industries CAT® Solutions enjoys relative dominance. Furthermore, Caterpillar goods have been utilized to construct a country's infrastructure with equipment supplied to the UN and the Dhaka City Corporation (Bangladesh Army). Wheel Load-ers, used in buildings and transfer construction materials.

Background of BanglaCAT	
2004	<ul style="list-style-type: none"> ✓ With approximately 100 employees, BanglaCAT started its journey with Caterpillar Inc. USA as their authorized dealer in Bangladesh.
2005	<ul style="list-style-type: none"> ✓ With nearly 200 employees on board, BanglaCAT launched group insurance coverage & gratuity policy for the employees. ✓ Received the Top Asian-Pacific Power System Dealer Award for Highest Electric Power Sales.
2006	<ul style="list-style-type: none"> ✓ Received the Parts Growth Challenge Award and the Top Asia Pacific Power System Dealer Award for highest electric power sales.
2007-08	<ul style="list-style-type: none"> ✓ Received the Top Asia-Pacific Power System Dealer Award for highest electric power sales. ✓ Successfully installed 100MW for Client Hosaf power plant.
2009	<ul style="list-style-type: none"> ✓ Received the Top Asia-Pacific Power System Dealer Award. ✓ Caterpillar certified BanglaCAT's Ashulia facility as a 4-star contamination control full-fledged workshop – it was the second of its kind in the entire South-Asian region.
2010-11	<ul style="list-style-type: none"> ✓ Introduced the National wide 24/7 product and service support.

	<ul style="list-style-type: none"> ✓ Installed 100MW power plant for Desh Energy Ltd. ✓ Established a state of the art warehouse facility in Vulta, Rupganj, Narayangaj.
2012-13	<ul style="list-style-type: none"> ✓ Received Caterpillar's Dealer of Excellence Award and Excellence Award in the Fork Lift truck Business. Made a strong foot-hold in the Marine market with an aim to deliver. One-stop High Value solution with CAT marine propulsion system and marine power generation system. ✓ With a combined capacity of 3500MW, CAT generators in Bangladesh were supplying 35% of the national grids electricity production.
2014	<ul style="list-style-type: none"> ✓ Within a decade of operations, BCAT became one of the largest contributors in the power generation and infrastructure development sector in Bangladesh, and globally recognized as the largest EPG dealer of Caterpillar in the Asia-Pacific region. ✓ GBM- Group Brand Management department is launched to support the Brand Equity of the BCAT
2015	<ul style="list-style-type: none"> ✓ Topped the Diesel generators sales. ✓ Established its own call center – 16448. ✓ HR ERP Catlist got into live operation with full suite of functions.
2016	<ul style="list-style-type: none"> ✓ With nearly 500 employees, BCAT topped the Diesel Generator Sales for the second time in a row. CAT certified BCAT's Ashulia facility as a 5-star contamination control full-fledged workshop. ✓ CRM department in launched to ingrate all the sales function to create business synergy.
2017	<ul style="list-style-type: none"> ✓ Achieved High Bronze Level Performance for Service Excellence Program. ✓ Established first and the biggest Rental Yard in Bangladesh with a Machine Demonstration Ground ✓ Received Gold Global Warranty Excellence Award. ✓ Successfully floated 1250 million BDT worth of Zero- Coupon Bonds subscribed by large corporates in Bangladesh. ✓ Launched the parts sales counter in Ashulia.
2018	<ul style="list-style-type: none"> ✓ Launched Workopolo virtual office Application in BCAT. ✓ Launched Virtual office and work from home facilities for the employees.

	<ul style="list-style-type: none"> ✓ CAT generators have the combined capacity of over 4000MW and BCAT continues to be the largest contributor in the Power generator sector of Bangladesh.
2019-20	<ul style="list-style-type: none"> ✓ One stop service for customers at central service office Ashulia achieved Strong Silver accolade in Caterpillars worldwide service Excellence program and Strong Bronze in parts excellence program in 2019. ✓ Launched first ever Facebook instant game “Bangladesh Unlocked”

Table 1: Background of BanglaCAT

2.2.2 Mission

Bangla Trac Limited (BanglaCAT) is excellent in providing value-added service to its customers, and being country's leading contributors in the power generation and infrastructure development sectors. BanglaCAT strives to meet the demands of each and every one of its clients by creating and maintaining long-term relationships, understanding unique client demands, and delivering creative solutions in response. There is still no scope for complacency at BanglaCAT; the organization strives to give better and quicker services to its clients all time through advanced service and meditative practice. To ensure continual improvement and expansion, the organization aggressively promotes the idea of developing and maximizing the efficiency of its human resources, technology, and capital.

2.2.3 Vision

The vision of the company is to achieve advancement via technological innovation, ethics, integrity and environmentally responsible. The company's philosophy is upon the idea of offering high-quality customer service through consistent teamwork among responsible employees, as well as reliability and innovative techniques.

2.2.4 Tagline:

Their tagline is:

“Your Industry Our Energy”.

Through it they try to indicate the importance of their product for an industry. Their tag line seems like very logical to me, because without an engine or generator any industry cannot run their operation smoothly. By this line they tend to say, they are the powerhouse behind their customers success.

2.3 Management Practice:

Like other organization, BCAT follows a distinctive organization structure. This company follows functional organizational structure where responsibility moves from highest to lowest order. Yearly the company arrange twelve board meeting and once in a month. In the meeting the higher authority discuss about the company’s growth, strategic decisions, risk factors etc. The meeting held on the last Thursday or Sunday of every month. One dedicated team from executive’s office is responsible to arrange that meeting. In that meeting all department head need to be present, and they must share about their insights about their dedicated department and the overall company. Also, for doing the performance appraisal more effectively, authority form a team from HR department. This team is responsible to make the evaluation forms regarding on employee performance, and collecting the response on time. During the lockdown the management ensure work from home facilities for their employee. Also they ensure the social distancing in their office.

2.3.1 Values in BanglaCAT:

- **People First:** BCAT always prioritize their consumers need and they believe the success of their organization is heavily connected to their customer satisfaction. As a result they always want to provide the best possible service to their consumers.
- **Customer’s success:** To make their customer successful BACT always try to provide the best quality service. Even after selling the product the company do a routine checkup of their machine, and if needed take the necessary action. Also for the wellbeing of their customer BACAT developed their own call center. Through that the

company assure 24/7 servicing facility. From there I can understand that BCAT is very serious about their consumer success.

- **Integrity:** The management committee of BCAT try to ensure the honesty, accountability and integrity in their business operation.
- **Innovation:** This Company believes that to survive in this digital world innovation is necessary. As a result to make their employees life easier BCAT innovate Workopolo. Through it the employee can do their official activity from their home. It is one of the significant innovation in this pandemic situation.
- **Environmentally Responsible:** BCAT always concerned about the environmental issues. As a result they launched 3R in their organization. 3R stands for Reduce, Reuse and Recycle. This is another significant idea to save the environment.

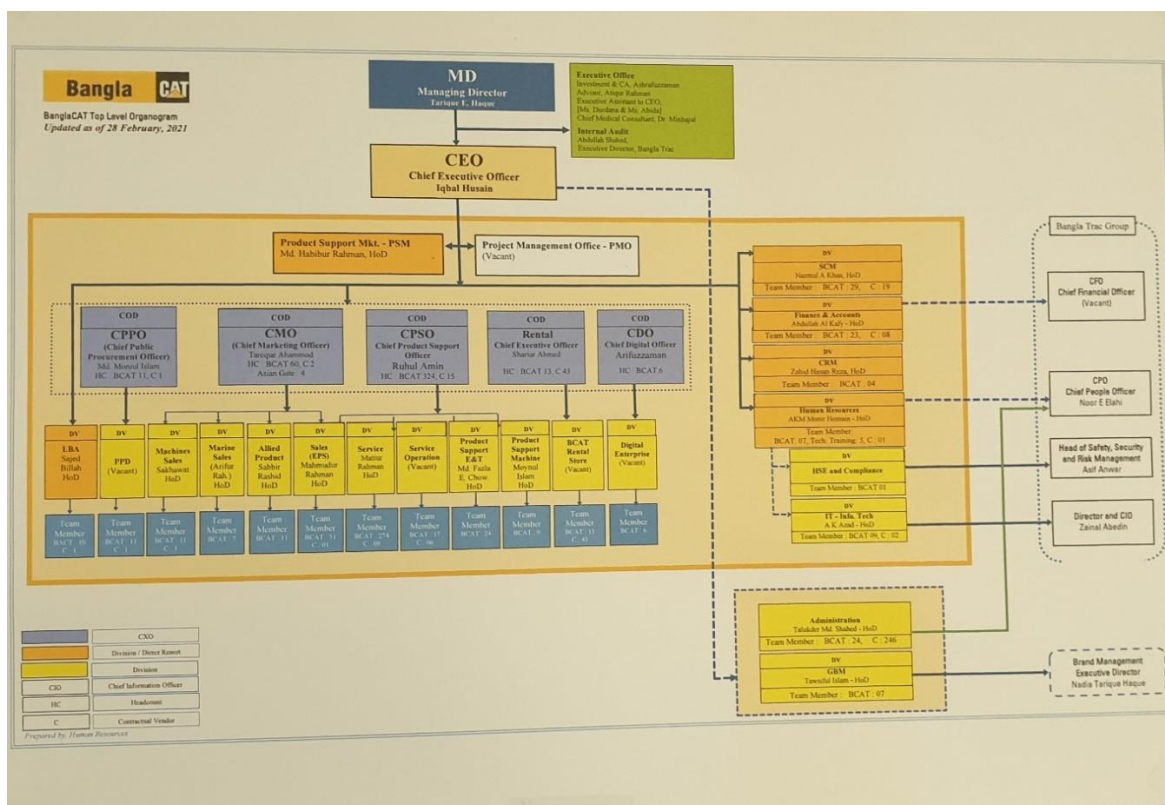


Figure 1: Organogram

2.3.2 Core Management Practice: BCAT follows a flexible and friendly working environment. Once a month, the CEO visits each division and takes the employee's opinion about their experience and challenges. Also, before taking any strategic decision, the top management asks about the review from the divisional head. Then the divisional head arranges

a meeting in his dedicated department and discusses the pros and cons of that decision. After that, the divisional head reaches the feedback of root level employees to the higher authority. And, based on the feedback, higher authority take the final decision. In that way BCAT, s management follows a supportive and decorative leadership style. However, the management promotes teamwork in their organization. It's like two to three people will conduct a training program, and the recruiting process will be conducted by three employees. In that way, the workload on the employees might reduce, and they might feel less stress. The management also organizes some training program to enhance the skill set of their employees.

2.4 Marketing Practice:

2.4.1 Marketing Mix: It is a type of marketing tactic which is use to promote one companies products or brands.

BCAT's Product Mix: BanglaCAT is a market leader in caterpillar products used in Bangladesh. The company has offered machinery to industries such as food and beverage, ready-made garments, and agro-processing. BanglaCAT's or EPG merchant for caterpillars globally. The company is ranked at the fifth position in EPG dealers in the Asia Pacific. BCAT also provides repairing facilities for their sold products. This company have established its own call centre to ensure a 24/7 servicing facility for its customers. The Product which BCAT offers are-

SL	Products	SL	Products
1	Gas generator	9	Diesel generator
2	Excavator	10	Forklift
3	Wheel loader	11	Backhoes
4	Heavy fuel oil generator	12	Dual fuel generator
5	Marine propulsion engine	13	Marine auxiliary generator
6	Motor graders	14	Paving equipment
7	Track type tractors	15	Compactors

8	Wheel dozers	16	CAT equipment spare parts, lubrication oil, transmission oil, hydraulic oil, etc.
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Table 2: Product Offerings

BCAT's Price Mix: BanglaCAT products have high prices; for example, a CAT powered generated costs 2,755,000 Taka. Worldwide, Caterpillar is well recognized for its best quality machines. Their product has a longer lifetime that is why the price is a bit higher. BCAT also ensure the warranty facility and best suitable services for their product. On the other hand, through rental service, buyers can also decide to hire the company's products and pay a lower price. For instance, a diesel generator for hire is approximately 24000 taka per month.

BCAT's Place or Distribution Mix: The Company sells directly to consumers through its website and physical stores. In Agrabad, Chittagong, they have their machine sales office. Also, BCAT has their workshop in Vulta, Narshingidi and Ashulia. Furthermore, they have a parts counter near Ashulia highway road. Furthermore, BCAT has its own rental yard, which located in Mathbari, Gazipur. It also sells machinery to suppliers across the world, where they sell the items to final consumers.

BCAT's Promotion Mix: The Company uses social media to increase brand awareness. The Facebook account of BanglaCAT is quite informative in describing the company's products, strengths and history. The company builds awareness through its website, where it showcases products, rentals, spare parts and services. BanglaCAT engages in outdoor advertising through trade fairs, seminars and trade shows.

2.5 Financial Performance & Accounting Practices:

2.5.1 Accounting Practice:

Every company have their own style of accounting practices. It is necessary for them to run their business smoothly. As this company is a private Ltd. company, the information regarding their financial practices is not publicly available. The company follows a strict policy in terms of its privacy issue. However, as an intern and to complete my report, they have shared some basic information with me. According to the information, the company's financial statements cover twelve months from July 1 to June 30 and is followed consistently. Here, in the financial

statement historical cost basis are used except for inventories which are measured at lower of cost and net realizable value, and for certain assets, which are stated either at a revalued amount or fair market value as explained in the accompanying notes.

In terms of depreciation, the company follows the declining balance methods on all fixed asset rather than land. Depreciation of building, rental assets and tools are charged in the cost of revenue as they are directly related to revenue generation. BCAT has exposure to credit, liquidity and market risk. To manage that type of risk, the company use enterprise resource planning software.

2.5.2 Financial Performance: Bangladesh is now a developing country, and by 2031 it aims to be a higher middle-income country. To achieve this goal Bangladesh government is currently holding some mega projects in its hand. The demand for material handling and construction equipment is now increasing day by day to complete those projects. On the other hand, BCAT is the market leader in this kind of equipment industry. As a result, I have seen healthy growth in their financial statements. Also, to assess its financial stability, I have calculated some ratios for this company.

During 2018, 19 & 20, their current asset ratio was more than one times, and their inventory turnover ratio was accordingly 2.7, 2.1 & 1.7 times. Also, in that three years, their debt to asset ratio was respectively, 13%, 17% & 22%. That means in 2020, 22% of the total asset were financed by debt. Last two years, this rate was below 20%, but due to the COVID outbreak last year, the debt financing has increased. The average collection period of this company was accordingly 115,183 and 208 days. It's the days that may require for the company to collect its receivables. In terms of net profit margin, it was accordingly 4, 6 and 8%. It means TK 100 of sales generate 4, 6 and 8 takas of profits in 2018, 19 & 20.

From the above information, I can say that this company is a profit-generating company, and soon, it may grow more. 2020 was not a suitable year for many industries to generate profit because, at that time, the whole world was infected by COVID- 19 virus. As a result, I have noticed that BCAT'S net sales dropped to 24%, and net profit dropped to 17% in that year. However, overall the company is doing well in its industry and considered as the market leader. From the above information, I can say that this company is profit-generating, and in the near future, it may grow more.

2.6 Operations Management and Information System Practices:

2.6.1 Responsibility of each division:

- **Large Business Account (LBA):** This department generally deals with the premium or large customer of BCAT. They ensure the after-sales service for their premium customers.
- **Product Support E&T:** this department deals with the general customer of BCAT and ensures the after-sales service for them.
- **Public Procurement Department (PPD):** This department is responsible for dealing with the government like; for several government projects, they need to use constructions materials or equipment, and for that government release tender in the market. So, to look after the government-related issues, BCAT has this dedicated division.
- **Machine Sales:** This department is responsible for ensuring all the machine sell related matter like selling of Wheel loader, Excavator etc.
- **Marine Sales:** This department provides the engine or generator for ship, vessel etc. All type of marine solutions is being handled by this department.
- **Allied Product:** it handles the selling portion of non-CAT products like Ingersoll Rand Air Compressors, Oil-Free Rotary Screw Air Compressors
- **Sales (EPS):** This department is only working on the generator side. All kinds of generators, like gas generator, diesel generator from BCAT, are being sold by this division.
- **Service:** After selling the generators, the company need to ensure after-sales service for their customers. So, to ensure this, the company create this dedicated division. As far the customers' needs and request they ensure the necessary service. They generally go directly to the site and do their repairing related task.
- **Service operation:** This division does the backend work of service like warranty management, product reporting, quality etc.
- **Digital Enterprise:** this department works to prepare the technological connectivity in the company like – workopolo: it is the reporting connectivity of the company, and through DRM machine the company can monitor the engines remotely. This was prepared by this division.

- **Product Support Machine:** This department ensures the after-sell services for BCAT machines.
- **BCAT Rental Store:** BCAT also do the rental activity. Instead of buying the machine or generators, sometimes their customer rent it from them. This department handles these activities.
- **Product Support marketing division:** The parts or products which needs promotion; this department do that part. Also, how many parts are required for a certain period of time- these types of assessment are done by them.
- **Project Management:** The project that BACT takes in their hand needs to be followed up with top management. So this department is responsible for developing, coordinating and sharing the project updates with the leaders.
- **Supply Chain Management:** Their duty is to sourcing & procuring the product from the suppliers and planning, managing & coordinating all the activities related to it. For example: ordering the parts from Caterpillar, maintaining the warehouse, delivering the parts etc.
- **Finance and Accounting:** this department works to keep track of companies financial condition like- doing bookkeeping, preparing budget and forecasting, estimating risk, managing the tax, helping the management to take the key strategic decisions.
- **Human Resource:** This department is very crucial for the company. Their duty is recruiting, keeping tracks of employee's records, arranging training session, preparing salary structure and dissolving conflict in the organization.

Except for these departments, the company also have a Customer relationship, Admin, IT and Group brand management department.

2.6.2 Who reports to whom?

According to the ORGANOGRAM, I have seen some doted & direct line. Here, the direct line means direct reporting, and the dotted line means doted reporting.

Here HR, Finance, CRM and SCM division directly report to the CEO but dotted report to the CFO& CPO. On the other hand, the admin department is liable to the chief people office and the GBM department directly reported to the Brand management executive director. However, both departments do dotted reporting to the CEO. Except for them, the LBA department directly reported to the CEO, but the PPD department reported to the chief public procurement officer (CPPO). Furthermore, Machine sales, Marine sales, Allied product and sales (EPS)

directly reported to Chief Marketing Officer (CMO). Then, Service, service operation and product support E&T departments do their reporting to Chief Product Support Officer (CPSO). In the same way, the Product support machine and BCAT Rental store report to the Chief executive officer and the Digital Enterprise department report to Chief Digital Officer. After that, all chief is directly liable to the Product Support Mkt, Project Management Office (PMO) and CEO. Finally, the CEO directly reports to the Managing Director (MD).

2.6.3 Software Used in BCAT:

- **My HR Software:** This is a kind of connectivity where all information about an employee is being stored. The information like- once education background, experience, personal details, nominee information etc. Anytime anywhere, an employee can enter in that software and can collect/ view the necessary data. The domain of this softer are given to the HR, so it's called My HR.
- **Workopolo Software:** This is used to keep track of an employee's daily activity and the progress of work from home. If any employee cannot come to the office physically, they can share their work updates here from home.
- **Enterprise Resource Planning software (by Lawson):** The revenue division mainly uses this software. They use it to do their day to day activity like- accounting, budgeting, risk management, forecasting etc.

2.6.4 The Grading Scale:

BCAT's employees are divided into three categories. The first one is BCAT. They are mainly officer level worker. However, their employee ID looks like BCAT-55 7. The second one is Acorn. They are the supporting stuff of the company like- peon, cleaner, driver etc. Their employee Id looks like- AC-31. Last one is Asian Gate. They are responsible to look after the service division. Their employee ID looks like AG-03.

Rank	Position
D	Head of the Department, CEO, CMO Etc.
M-1	Sr. Manager
M-2	Deputy Manager, Manager
M-3	Asst. Manager , Sr. Executive

M-4	Jr. Executive, Executive
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Table 3: Grading Scale

2.7 Industry and Competitive Analysis:

2.7.1 Porter's five generic strategies on BanglaCAT Ltd.

Porter's five forces model helps in assessing the firm's position and the effect on its profitability concerning substitute's availability, entry of new players in the industry, supplier power, buyer power, and competition. BanglaCAT's analysis based on Porter's five forces model is as follows:

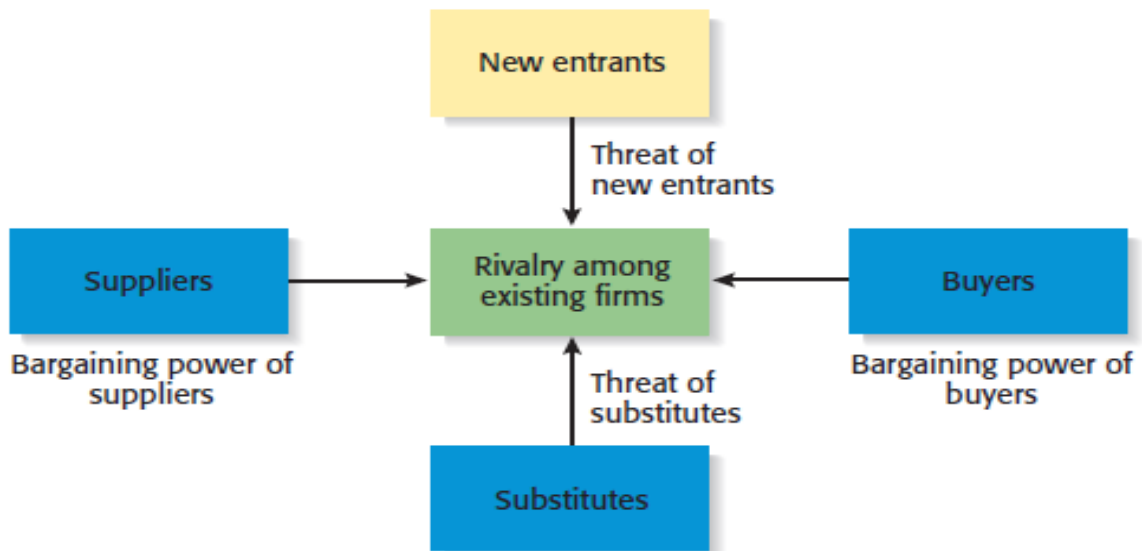


Figure 2: Porter's Five Forces

- ❖ **The threat of new entrants:** The industry in which the company functions requires a large amount of investment; one needs to be technologically advanced for manufacturing of the product portfolio BanglaCAT works on. Therefore we can say that it might seem complicated and risky for new entrants to join the sector. Thus we can conclude that threat of new entrants is low for the company.

- ❖ **The threat of substitutes:** The company seems to witness a minimal impact on its share of the market and profitability on account of substitute product availability. As BCAT deals in the sale of machinery, generators, and engines, and there are barely any

substitutes that can replace these products, and with the complexity in duplicating and replacement, the threat of substitutes remains low.

- ❖ **Rivalry among existing firms:** BanglaCAT holds a solid position concerning the existing firms, as it is reputed as one of the major contributors to the power and infrastructure sector in the country it operates and comes up as the largest EPG dealer in the Asia Pacific region. It would be difficult for the competitors to copy and match the company's productivity, range of products, the experience it holds in the field, etc. Thus we can say that the company holds a powerful position on account of competition and rivalry present.

- ❖ **Bargaining power of buyers:** With the presence of very few sellers of the product in which the company deals, the strong position of the organization in the market, versatility in the product range, with less opportunity on the part of the buyer to replace the product with its substitute, with efforts of the company to be identified as a best value-added service provider there are least chances of price conflict because of which the buyer will switch to other alternatives. Thus we can say that the buyer seems to have less bargaining power.

- ❖ **Bargaining power of suppliers:** Being an authorized dealer of other company's product and not the manufacturer itself (BanglaCAT a dealer of Caterpillar Inc. USA), the company seems to be dependent on Caterpillar for supplies. Furthermore, if the USA based company calls off the agreement with Bangla CAT or starts looking for more participants to offer dealership, it would impact the profitability of Bangla CAT. Thus we can say that supplier enjoys more bargaining power in comparison.

2.7.2 SWOT analysis of Bangla CAT Ltd.

The SWOT analysis of an organization helps in determining the company's strengths and weaknesses concerning its internal environment, and these are controllable. Weaknesses could be overcome and managed with required efforts, and consistency could be maintained on part of strengths; the analysis also reveals the opportunities and threats present concerning the external environment, and these are uncontrollable. These cannot be abolished or eradicated,

but their impact on the organization's operation could be minimized through required modifications.

The SWOT analysis of BanglaCAT based on information provided in the case is described as follows:

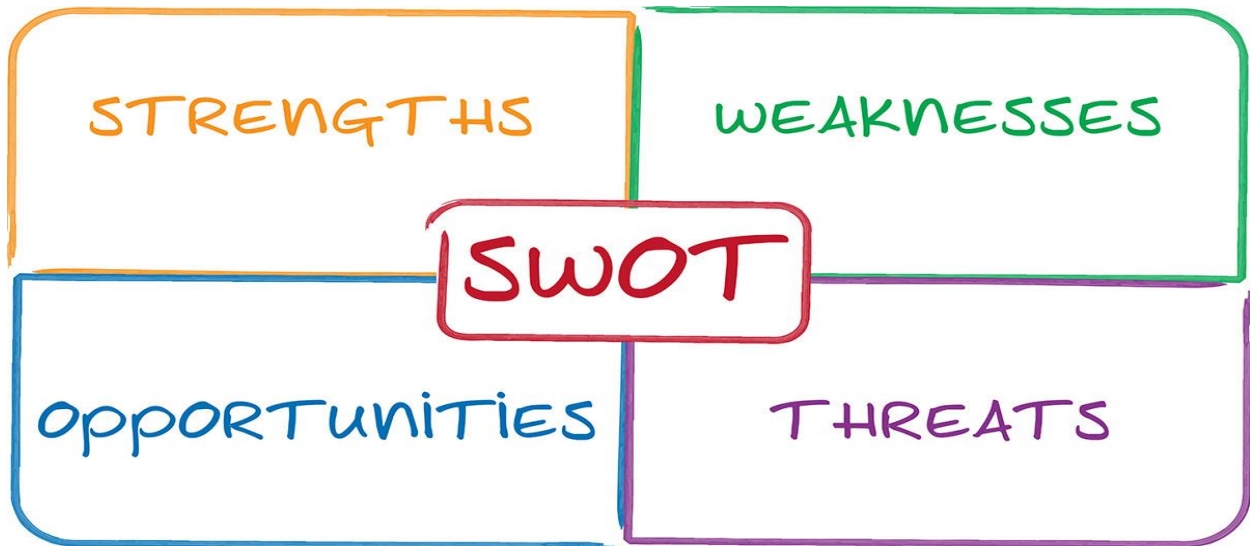


Figure 3: SWOT Analysis

1. Strengths:

Strong market presence: The organization enjoys a strong market presence through the recognition it gained since its inception. Being identified as the largest supplier of power generation equipment and machinery and the largest EPG dealer, the company owns a good hold over the market.

Rich experience of the field in which it functions: The amount of experience the company possesses in the marketing field distinguishes it from others in the business.

Product range: The Company's wide range of offerings adds to its profitability and helps to increase the customer base.

Customer service: The company's dedication towards the commencement of business operations effectively and the welfare of the consumer base provides the quickest possible service.

Human resources: Workforce inclined towards providing uninterrupted service and technological solutions to the customers helps the company in gaining a vehement position in terms of manpower.

2. Weaknesses:

Lack of control over the assembly and production process: The company lacks control over the assembly line and production process, as it simply sells on behalf of Caterpillar, and its decision on account of carrying out business or not would impact the identity of BanglaCAT.

3. Opportunities:

Greater chances of expansion: Being recognized as the best for its services in the Asia Pacific region provides the company greater chances of expanding its operations area in other neighboring countries.

Work culture: The company's approach focused on building the firm's identity as the best value-added service provider, and workforce promised towards meeting the needs of the customer on a priority basis adds on to the cultural aspect.

4. Threats:

Domestic country's business relations with other countries: Being based in Bangladesh, the company sells products of Caterpillar the U.S.-based company; thus the unsound relations between the two nations can impact the profitability of BanglaCAT, as it will hinder the business transactions between the two companies.

Supplier's control over the business: Being the supplier, Caterpillar holds control over the operations as it is the one that manufactures and then passes on to BanglaCAT for sale and rent.

2.8 Conclusion:

Lastly, I would like to say BCAT follows a friendly & flexible working environment, and this company is employee-centric. To support the workforce, the management introduces a unified insurance policy. Also, the management set their organizational structure in a way so that the accountability must be ensured, and the employee gets a clear idea about their task and whom they should report. Overall this company is a suitable place to work.

Chapter 3: “Multiple Valuation method: Difference between Market Price & Implied share price of USA’s Machinery – Construction & Mining Industry”

3.1 Introduction:

3.1.1 Background: In this report, I analyse the stock movement trends in the Machinery – Construction & Mining Industry of the USA. For my analysis, the focus company is Caterpillar Inc. The competitors are Terex Corp, H&E Equip Services, Manitowoc Company and Astec Inds Inc. Caterpillar enlisted as the fortune 100 company list in the USA. The company enlisted in this list is considered as the highest revenue generated company in the USA. (Kenton, 2021). However, I would like to analyse whether the investors are investing in the overvalued or undervalued stock in this part. I have used a valuation technique because valuation is the most effective technique to identify a company's intrinsic value or theoretical value of its stock. Different methods are being used to value a company. As an example – Relative valuation, discounted cash flow method, Multiple Valuation etc. Various forms of valuation may produce a different result. For these reports, multiple valuation techniques are being used to determine the implied value of the stock. Through these methods, I have analysed several financial Metrix in a similar industry. In these processes, especially six ratios are being used like – Price to Earnings per share o, Price to Book value, Price to Sales per share, EV/EBIT. EV/ EBITDA and EV/ Sales ratio. Here first three ratios are price-related, and the next three are enterprise-related ratios. These valuation techniques can simplify the complicated information into a series of values. So, an analyst can easily interpret complex data within a short period of time and can easily come to a conclusion. The drawback of this technique is, it can be used for a certain period of time, besides it overlook the future. According to Taylor & Francis, Ltd (1990), “this method is automated and more flexible version of the stock "screens" performed by the traditional investment managers”. This method is straightforward, and by it, an investor can easily decide in which stock they should invest. This technique can work better for the company, whose activity is similar in nature. For this reason, here use these techniques for the Machinery- Construction & Mining industry of the USA.

3.1.2 Objective: My main objective was to know about the financial feasibility of Caterpillar Inc. and its competitors as well. I tend to examine whether the USA Machinery – Construction & Mining Industries stock is being traded on overvalue or undervalue. Also, in this report, I tried to find out the actual value of the stock. Finally, I tried to show how the Covid-19 pandemic adversely hits a giant company like Caterpillar Inc.

3.1.3 Significance of the Study: From this report, the reader can understand the importance of multiple valuation approaches and by using it how an investor can easily know about the actual value of the stock. Also, the reader can know, if the stocks are becoming overvalued, what steps they can take with that stocks. Also, the same guidelines are given for undervalued stocks. Furthermore, the reader will get information about the competitors of the industry and how they are performing in the market. This report will give the actual information about the market and identified which stocks are more risky. Based on the analysis, the investors can decide which company is more preferable because, from this report, they will get five years of stock movement analysis.

3.1.4 Why NASDAQ:

NASDAQ is the USA-based global electronic marketplace, where the securities are being sold & bought. The data enlisted here are more transparent and easy to understand. It is an investor's centric market. However, I select this because my focused company is being enlisted here, and the companies are also USA-based. So, to collect the more accurate data, I select the NASDAQ

3.2 Methodology:

The information of these report are being collected from various sources. The primary sources of my data are secondary.

Secondary Data: For this report, I was dependent primarily on secondary sources. First of all, I have sorted the list of my necessary data. According to the need, I started collecting the annual report of my targeted company. For this part, I was highly dependent on the company's website. Then, to collect some specific information, I explored the NASDAQ, Bar chart, and New York stock exchange website. From there, I got my desired data. For the analytical part of the report, I tried to use some authentic information. To get that information, I have explored so many

research papers, articles and journals. The data from this source make my report an analytical and meaningful one.

3.3 Findings & Analysis:

3.3.1 Trend Analysis on Machinery – Construction & Mining Industry

Trend Analysis: Through the trend analysis, one can easily understand a company's financial conditions and capabilities in the market. For this part, the leading indicators of my analysis are the company's stock movement sequence and financial statements.

For Caterpillar Inc.:

Caterpillar Inc. was shortly denoted as CAT in the New York stock market. CAT is the trading code of this company. This is a USA-based company, and it is operating its business for more than 90 years. It is mainly the manufacturers of mining and construction equipment, Industrial and natural gas engines and diesel-electric locomotives. This giant company currently operates its business in 192 countries through its 161 dedicated dealers (*Caterpillar at a Glance*). This is also enlisted as the fortune 100 company in the USA. From the stock movement analysis, I can easily predict that this company has a good reputation and acceptance in the market. Let's begin with the stock movement analysis –

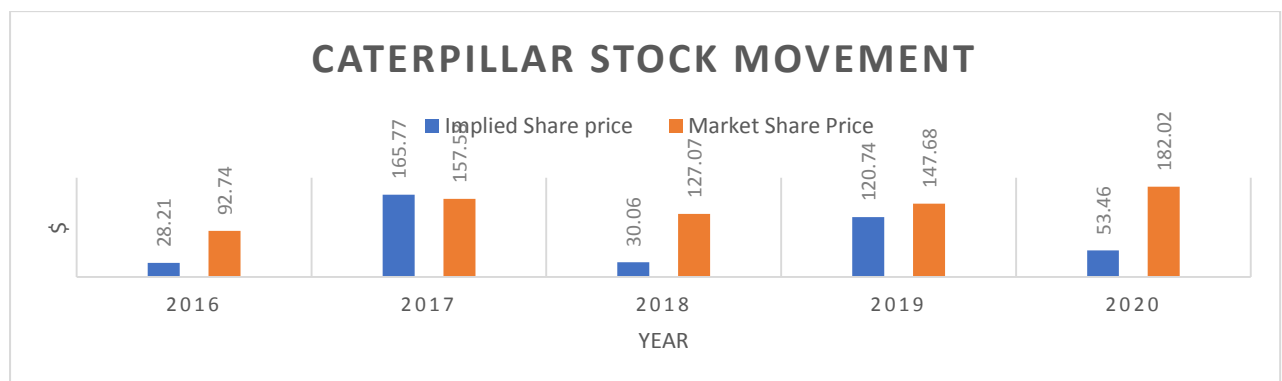


Figure 4: Caterpillar's Stock Price Movement

If I look at its 2016 data, I have noticed that its net profit margin was negative. This really hit hard on its actual share price. In 2016, the actual value of their stock was \$28, but their market value was \$92.74. It was overvalued because the market price was far above its actual price. Though the company is making a loss, their stockholder was not losing their hope on them. The stockholders kept their trust in CAT and believed that the company would backfire

enormously. In reality, actually, that has happened. From minus net profit margin, in 2017, it becomes 1.66%. This result is also visible in their actual stock prices. In that year, the price was undervalued, which means their market price, \$157.58, was less than their actual stock prices, which was \$165.77. Those people who have used this gape became profitable at that time. In 2018 I noticed an unusual movement in the stock price. This analysis shows that the implied stock price was drastically dropped, and it became \$30.06. The market value was 127.07. That indicates, the price was overvalued. The reason behind actual price fall was the US-China trade war. At that time, both countries imposed a tariff on each other and banned some of the products. That cold war hit very hard to the CAT because this company has a large market in China. Since, US imposed a tariff on the metal, so the company's production has slowdown. According to CAT's CEO, "due to the uncertainty in the economy, the dealer started to lessen the inventory and their demand also going down "(Egan, The trade war is stinging Caterpillar, and its outlook is dimming 2019).

As a result, the investors also reduced their investment and waited to change the situation. In 2019 when the two countries came up in a negotiable situation, the situation was improving. Though the stock was overvalued, the actual price was increased from \$30.06 to 120.74. This fluctuation is immense. However, in 2020 the company's actual stock price dropped to 57% in comparison with 2019. Also, the stock price was becoming overvalued that year. Then I noticed a significant drop in the implied prices. Where the market value was \$182.02, but the implied value was \$53.46. The reason behind this is the COVID 19 pandemic. Due to the consecutive lockdowns and economic recession, the company suffers a lot. Their profit and revenues become half in comparison to the previous year.

Notwithstanding, from the stock movement analysis, I can understand that those who want to take the risk and earn more money can invest here. From here, they can earn their desire amount of profit. Also, before investing here, the investor should calculate the probable risk associate with this company.

For Terex Corp.:

This company is one of the leading heavy machinery companies in the USA. This is established in 1972. This company is considered as the nearest competitor of Caterpillar Inc. In the New York Stock Exchange, the trading code for this company is TEX. Below I am going to discuss the trend of its stock.

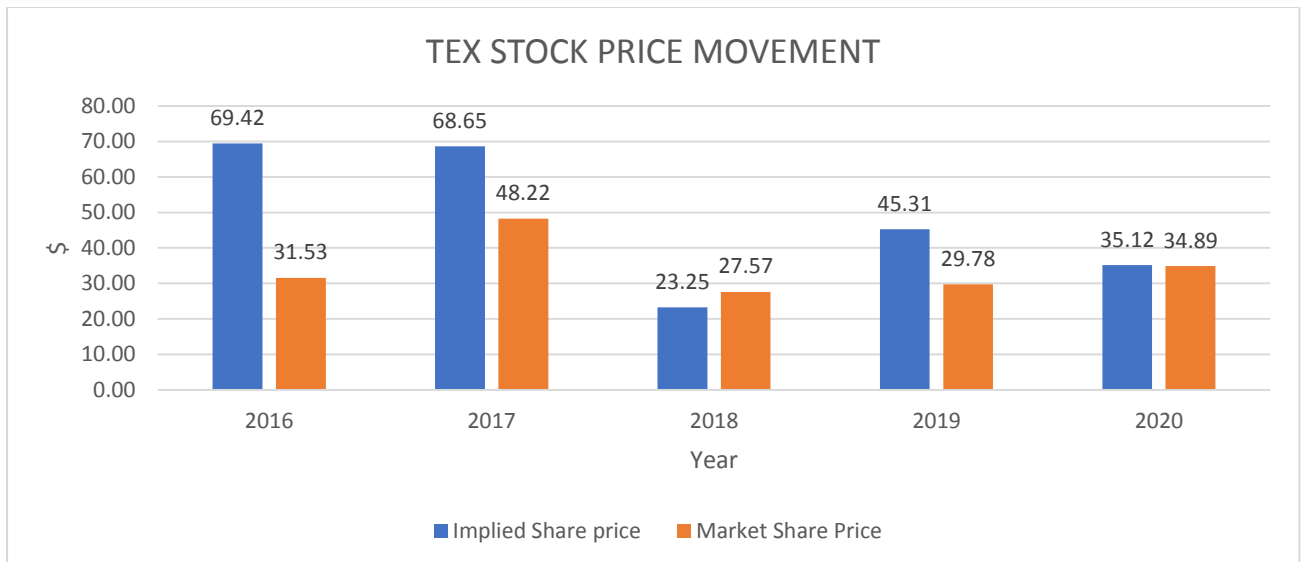


Figure 5: TEX's Stock Price Movement

According to the chart, I can say that in 2016, the market value of the stock was \$31.53, but the actual value of the stock was \$69.42. That means the stock was undervalued. At that time, the economic condition of the USA was not that much preferable. In that year, the natural gas and oil price was drastically dropped. The value of the oil and gas fall by \$190.1 billion compared to its previous year. (*Global Oil & Gas market shrinks by 13.6% in 2016 as low crude oil prices push down revenues 2020*).

For this reason, the oil demand suddenly increased a lot, but the production was the same. As a result, the market was facing a shortage of oil & gas supply. Furthermore, because of it, the heavy machinery and equipment company had lost their production and revenue. Specially Terex Corp had experienced a negative income at that time. At that time, if the company increased its stock prices than its actual value, the investors might be panicked and willing to sell their share. If everyone wanted to sell their share, it might bring fatal consequences for the company. So, to avoid it, the company might undervalue its stock. In 2017, again, the company undervalued its stock. During that year, the market value was increased to \$48.22. And the profit was increased to more than 7%. However, in 2018, the market value was \$27.57, and the implied value was \$23.25. In that year, the company overvalued its stock. The fluctuation was meagre.

On the other hand, in 2019, the implied value of the stock was \$45.31, and the market value was \$29.78. Which indicates the company undervalued its stock in that year. However, in 2020, the market value and the actual value of the stock were close to equal. There were very few differences between them.

From the above analysis, I can understand that the company is carefully trying to handle its stock market. From the annual report, I have found that the company is increasing its common share in the market every year. From it, I believe the company wants the investor to invest in their stock. An undervalued stock indicates, the probability of the loss is very little, and in the future, the investor might be profitable by selling their stocks. So, here the risk is very little, and in a time of recession, the company might not hit hard.

For H&E Equip Services:

This company was established in 1961. it maintains a high standard for rental equipment, services, parts etc. It is also the biggest dealer of Manitowoc and Grove Crane products in the world. In NASDAQ, it is enlisted as the code of HEES. Below I am going to discuss the movement of its stock.

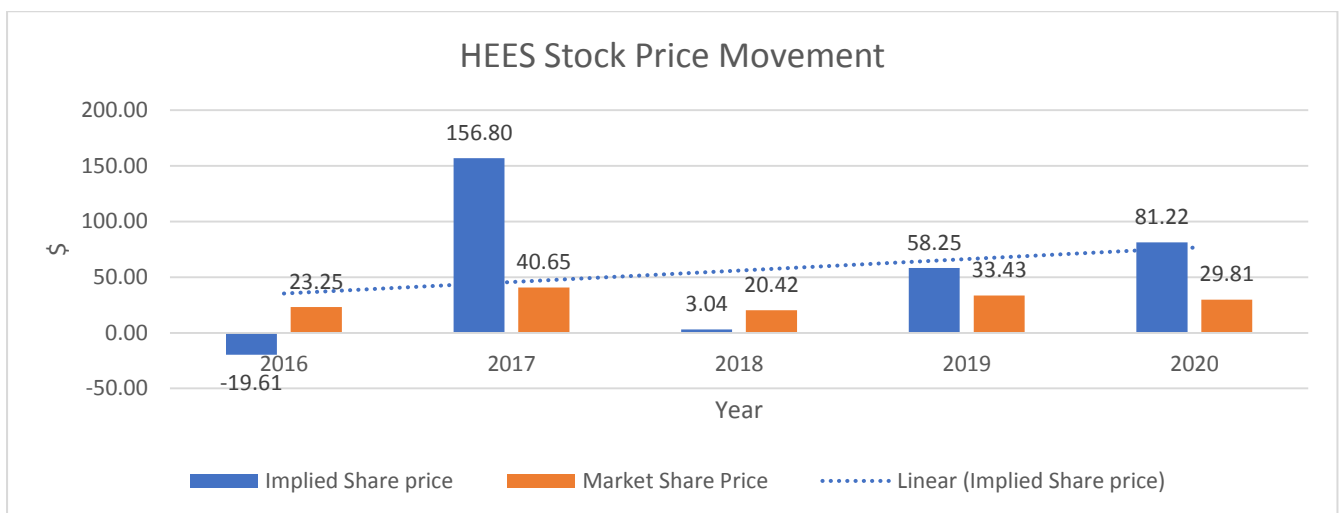


Figure 6: HEES's Stock Price Movement

In 2016, the companies actual share price was negative, like -\$19.61, but the market price was \$23.25. It indicates the price was overvalued at that time. As a company, HESS was doing well, but macroeconomic factors hampered this company a lot. When every company in this industry was struggling to make a profit, HEES became able to earn a moderate amount of profit. Also, its EPS was positive. Even though the company was doing well, its stock's value was heavily affected by its overall industry. Sudden reduction in the oil & gas value hit hardly the USA heavy machinery industry. Furthermore, overall, it reduces the value of their stock. However, in 2017, the company came back very strongly with an actual value of \$156.80, whereas the market value was \$40.65. That means the stock was undervalued. In 2018, again, the company

overvalued its stock. That year, the company was affected by the USA vs. China trade war. During 2019 & 2020 the actual value of the stock were, \$58.25 & \$81.22. Moreover, the market value was \$33.43 & \$29.81 accordingly. In the last two years, the stock was undervalued. The company might want to increase the investment; that is why they undervalued their stock. Those who want to avoid the risk can invest in this company.

For Manitowoc Company:

This company was established in 1925 and one of the largest crawler cranes manufacturers in the world. Under NASDAQ, the trading code of this company is MTW. However, it is considered as one of the most formidable competitors of CATERPILLAR INC. Below, I am going to analyses its stock price movement.

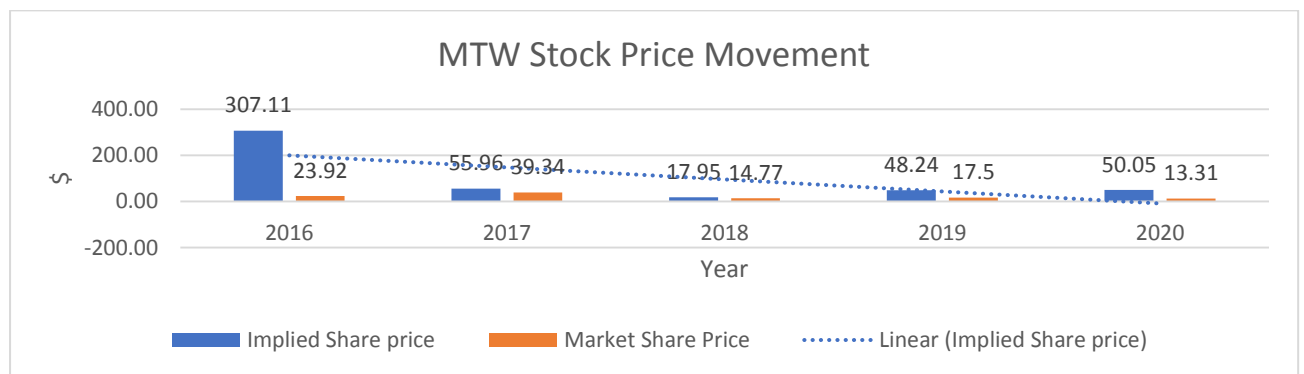


Figure 7: MTW's Stock Price Movement

During 2016, the market price was \$23.92, but the actual price was \$307.11. The fluctuation between the two values is immense. In that year, the whole industry suffered a huge loss, and these effects are also visible in the MTW's net income. The net income and EPS both was negative at that time. Besides, in that year, the company launch a large number of common shares in the market. In number, it was 139,841,214. It was the highest, compared to the last five years. So, the company has the pressure to sell those shares. Therefore, the company may undervalue its stock prices and wanted more investors to invest in their company. Undervalued share means, in reality, the share has more values than the current trading. Those who tends to take less risk can invest in that type of shares because the chances of losing the money are less here. However, in 2017, the company again undervalued its stocks. At that year, the market price was \$39.34, and the actual price was \$55.96. Also, the EPS was positive at that time. On

the other hand, in 2018, the company's net profit and EPS again became negative. The trade war was responsible for this loss. So, to recover from the loss, the company undervalued its stock. In 2019 and 2020, the market value was \$17.5 & \$13.31, and the implied value were accordingly \$48.24 & \$50.05. That means in both two years; the company undervalued their stock. The company is trying to play in safe mode in the market. Because of undervalued techniques, the company was able to enhance its actual value in the pandemic time.

For Astec Inds Inc.:

This company was founded in 1972, and during 1986 it went public. However, it is one of the leading manufacturers of road-building materials or equipment and stone crushers. In NASDAQ, the trading code of this company is ASTE. Now I am going discuss the movement of its stock -

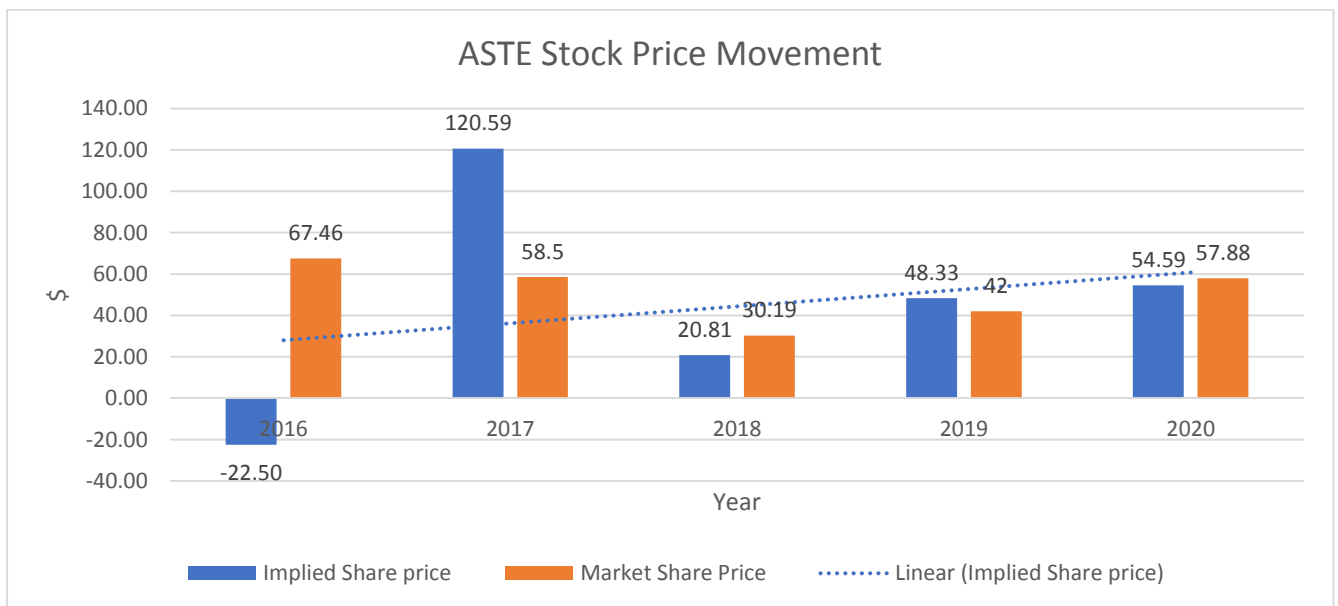


Figure 8: ASTE's Stock Price Movement

According to the above charts, in 2016, the company's actual value was negative \$22.50, and the market value was \$67.46. That means the stock was overvalued. The reason behind that was the unrest situation of the world oil & gas market. In that year, I have witnessed that the net profit margin 4.81% and ROA & ROE were accordingly 6.54% and 8.5%, which was the highest in the last five years. That is why the demand for their stock might increase at that year,

and the company might overvalue their stock. However, in 2017, the companies implied value was \$120.59, and the market value was \$58.5, which indicates the undervalued stocks. On the other hand, in 2018, the company overvalued its stocks in the market. During the economic depression, the company may predict that the war between the USA & China would be temporary, and soon, the market will go up. This has happened in reality. At that time, both the market and actual value were increased. Therefore, again the company undervalued their stock. However, in 2020 the company overvalued its stock. From that year, the world is suffering by Covid impact. So, the overvalued stock seems like a bit risky at that time. Those who aim to take rise and earn more profit were encouraged to invest in that company. One interesting fact of this company is that a year after another, the company overvalued its stock, and during the economic crisis, it overvalued its stock. As an example, in 2016, the oil and gas price were drastically dropped; in 2018, due to the trade war, this industry suffered a lot, and in 2020 the Covid pandemic situation hit this industry hard. Nevertheless, during that time frame, interestingly, the company overvalued its stock.

3.3.2 Price-related ratio Analysis for CATERPILLAR INC.: In this part, I will show the price-related ratio for CAT analysis.

Ratio	2016	2017	2018	2019	2020
P/E	-843.09	125.06	12.38	13.75	33.34
Industry Average	-162.83	72.19	4.27	24.59	-45.6
P/B	5.72	9.33	7.35	8.23	9.65
Industry Average	4.45	5.03	2.97	3.46	4.01
P/S	\$1.96	\$2.82	\$1.89	\$2.24	\$3.55
Industry Average	\$1.43	\$1.58	\$0.77	\$0.97	\$1.4

Table 4: Price Related Ratio

Price to earnings ratio: A company can understand how much an investor is willing to pay for every reported earnings through analysing it. It is like a measurement tool to indicate a company's current share price in returns for its earnings per share. By seeing at this, the investors can decide whether they are investing in the right company or not. A high P/E ratio indicates that the stock price is higher than the relative earnings and a low one indicates the

vice versa situation. Also, when this ratio constantly remains negative, it signals that the company is running towards bankruptcy. So, this ratio is an essential tool to understand a company's financial health.

For this ratio, I saw a massive fluctuation in 2016. At that year, the company's P/E ratio was - \$843, and the industry average was -\$162.83. This difference is very unusual for the CAT. This was a bad signal for the investors who were planning to invest at CAT. This analysis indicates that the stock price was undervalued, and investors were not interested in CAT. For every reported earnings, the investors are willing to pay less than negative value.

However, in 2017 the situation has been changed, and investors sowed a vast interest in CAT. They were willing to pay \$125.06 for every reported earnings, which was far ahead of the industry average. It indicates that the investors have faith in the company and hope that it will grow in the future.

In 2018, the whole industry suffered a lot because of China vs. USA trade war. At that year, the company's stock price was overvalued compared to its industries. The investors were willing to pay more than the industry average. As the CAT is a sizeable reputed company, investors may think that the probability of loss might be less compared to others if they invest here.

In 2019, the stock price again dropped below the industry average. Furthermore, the stock was undervalued; the reason behind that CAT might be focusing more on recovering their previous year's loss. In this situation, the investors should hold the CAT's stock. If the investors wanted to sell the stock, they might earn less profit than the others company.

Besides, in 2020 where the whole industry struggled to survive in the global pandemic situation, CAT held its value in the market. Their P/E ratio was more than the industry average. That means the share was overvalued. For that, my suggestion is, the investors should sell the share at that time. From my point of view, an overvalued price can fall at any time. There is no certainty.

Price to Book value ratio: It determines the perception of the market over a particular stock. A high P/B ratio may indicate that stock is overvalued, and in case of bankruptcy, the investor will get an adequate amount to cover his loss.

For the low P/B ratio, it behaves oppositely. It indicates the stock is undervalued, which means one is paying too much against what the company will be left in the time of bankruptcy. However, one drawback of this ratio is that it might not work better for the company, mainly depending on intangible assets.

Here in 2016, the company's P/B ratio was \$5.72. Furthermore, the industry average was \$4.45. Here, the difference is very little, but investors were ready to pay more for CAT. That means in that year; the stock was overvalued. Though in that year, the company made losses, but their revenue portion was lucrative. Also, the company had maintained a sufficient amount of cash balance in that year. In that year, not only CAT but also its competitors suffer a lot to recover the damage from the Great Recession. CAT has a glorious history, and that reputation helped the CAT stand in the market firmly.

However, in 2017, 2018, 2019 & 2020 the companies P/B ratio was accordingly \$ 9.33, \$7.35, \$8.23 & \$9.65. Every year, CAT has maintained a higher ratio compared to its overall industry. That means every year, the company's stock was overvalued. For every \$1 of net asset, the investors were willing to pay more than seven or eight times of its assets. This has happened because the investors believe that the company's assets will not be devalued in terms of bankruptcy. That means in returns of today's investment; they might gain more in the future. Their view looks very logical because in the annual report I have seen every year, the company maintains relative differences between its assets and net debt. Every year, the company's total assets can cover its net debt, and they are practicing it consistently.

Price to sales ratio: It is another crucial indicator for making a proper valuation of a company. This ratio actually compares the stock price with its revenue and signals the investors for their stocks how much they are actually paying against the company's sales per dollar. If it is above the industry average, then it indicates the stock is overvalued, and investors trust that the company will grow more in the future. On the other hand, if it performs below the industry average, then it is considered undervalued. Furthermore, it means the investors do not have that much faith in the company.

For 2016, 2017, 2018, 2019 & 2020, the companies P/S ratio is accordingly \$1.96, \$2.82, \$1.89, \$2.24 and \$3.55. Also, the industry average for this ratio is \$1.43, \$1.58, \$0.77, \$0.97 and \$1.4. Here, I have identified that the investors are paying more than the industry average for each year from my analysis. It indicates that the company's stocks are overvalued.

There might be several reasons behind that. Firstly, I have noticed that CAT's revenue is increasing every year. As an example: From 2016 to 2017, the revenue has increased to 12%. However, in 2018 it was enhanced by 7%, and in 2019 their revenue reduced by very little, which was .8 %. Then, in 2020 due to the Covid outbreak, the company has lost its revenue portion by 50%. In the pandemic situation, the whole industry is hitting hard. This sales record of the company gives a positive signal to the investors and gives them the guts about its future

growth. Secondly, with slight fluctuation, the company maintains a consistent EPS, like 10.26, 10.74 and 5.56.

For the above reason, I think the company can maintain a healthy P/S ratio.

3.3.3 Covid-19 Effect on Caterpillar Inc.:

Today's world is now facing a severe infectious disease named Corona Virus. The whole world is now under fear of it. The outreach of this pandemic outbreak is now adversely attacking the world's economy. Because of it, every country is now suffering. From the movements of the unemployment rate between developed countries, anyone can predict its effects. For example, For the USA, UK and Canada, this rate has increased to more than 3% compared to 2019 (Lora Jones, *Coronavirus: How the pandemic has changed the world economy* 2021). Also, worldwide lots of people are losing their jobs, business and standard of livings.

However, as CAT is operating its operation worldwide, so this pandemic situation immensely hit this company. To reduce the severe impact of these diseases, most of the country goes for the lockdown policy. According to this policy, every physical activity like- office, school-college, market, shopping complex, social gathering is strictly prohibited. As a result, CAT has lost huge equity throughout the world. Besides, the companies supply chain system and operations were affected heavily. For an extended period, trade between two countries was prohibited. As a result, the export and import activity was being stopped. Since most of the profit comes through its dealers, the economic outbreak reduces their demand as well because, due to the constant lockdown and curfew from the government, all projects like constructions, manufacturing, etc., were being hanged. Therefore, the dealers faced difficulties in selling their already stocked products. In that situation ordering a new cycle of products would be a deadly step for the dealers. So, overall, the demand of the dealers drastically falls. Besides, in 2020, dealers' inventories have been reduced by \$2.5 billion (Foelber, *Caterpillar Stock Looks Expensive: Here Are 3 Reasons It's Still Cheap* 2021). It all happened because of the COVID situation. If we look at the below charts, we can relate how much revenue the company has lost.

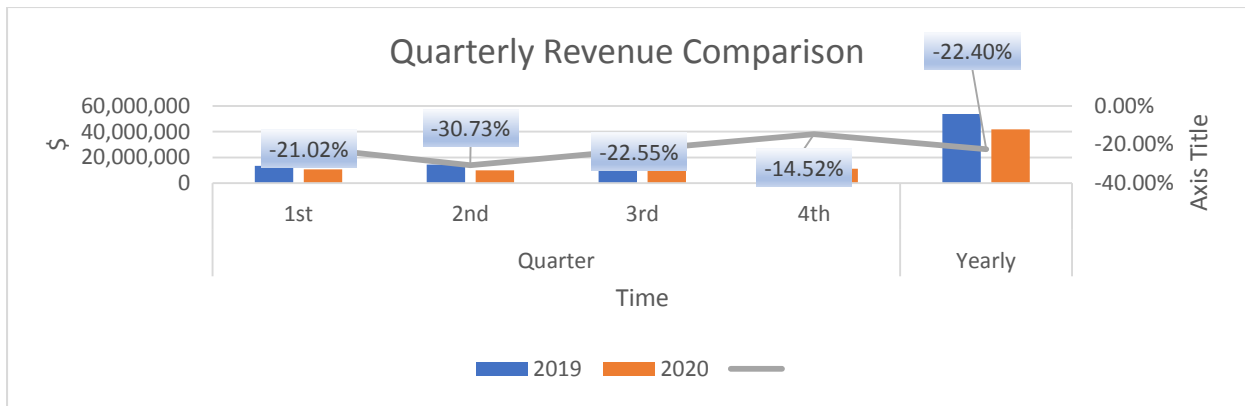


Figure 9: Quarterly Revenue Comparison

In this chart, I tried to show the revenue comparison between 2019 & 2020, quarterly and yearly. Here, in the first quarter of 2019, the total revenue was \$13,466 (million), and at the same time, in 2020, the revenue was \$10,635 (million). It means that by the time frame, the sales dropped to 21.02%. In the 2nd quarter, the Covid virus spread worldwide, especially in Europe and America. At that time, in comparison to 2019, sales dropped to 30.73%. Besides in third and 4th quarter, it dropped by 22.55% & 14.52%. Also, if I make the yearly comparison, then evidently, it around a drop of 22.4%.

Moreover, due to this situation, the commodities price was increased very much. For this reason, the company needs to buy its raw materials like spat, aluminum, and iron at a very high price. For this reason, the production cost was increased than the last year. Also, the company needs to redesign its distribution process and rethink its stakeholder's safety issues. Overall, it increases the company's expenses, which has a significant impact on its net income. In the charts, I tried to compare the quarterly & yearly net income.

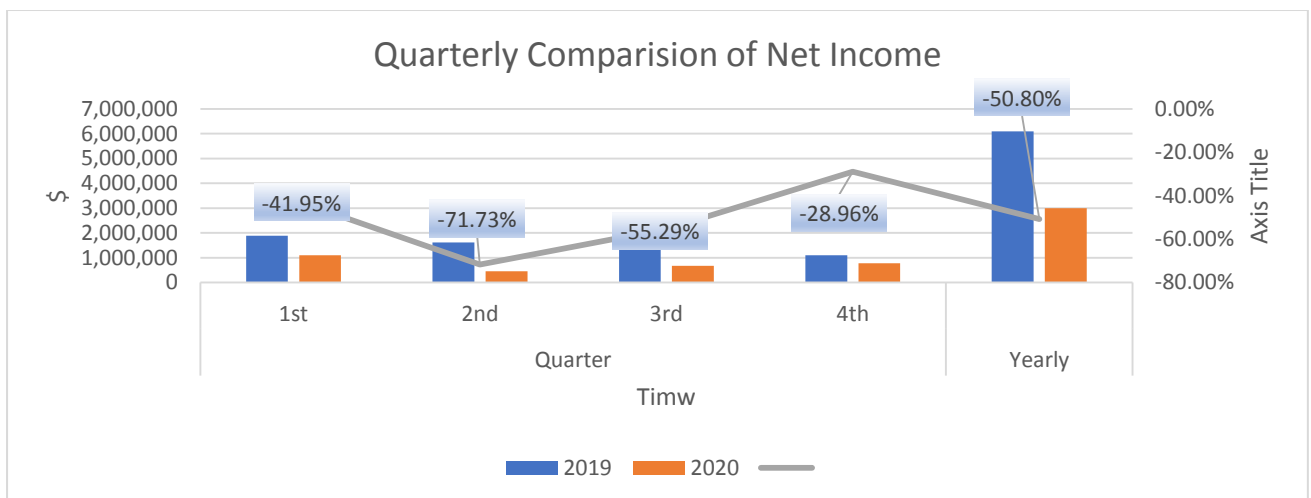


Figure 10: Quarterly Net Income Comparison

According to the above charts, during the first quarter, the company's net profit decreased to 41.95%, and in the 2nd quarter, the company has incurred more losses which were 71.73%. However, in the last two quarters, the profit dropped accordingly 55.29% & 28.96%. In comparison to 2019, the company's net income dropped more than 50%. According to CAT's CEO, the company's debt had enhanced by 22% (*Caterpillar: Overvalued As Price Ahead Of Fundamentals (NYSE: CAT)*). It might be the biggest reason behind this fall. In regards to the company's profitability ratio, I have noticed a vast fluctuation. This Pandemic situation hardly affects the company's profitability ratio.

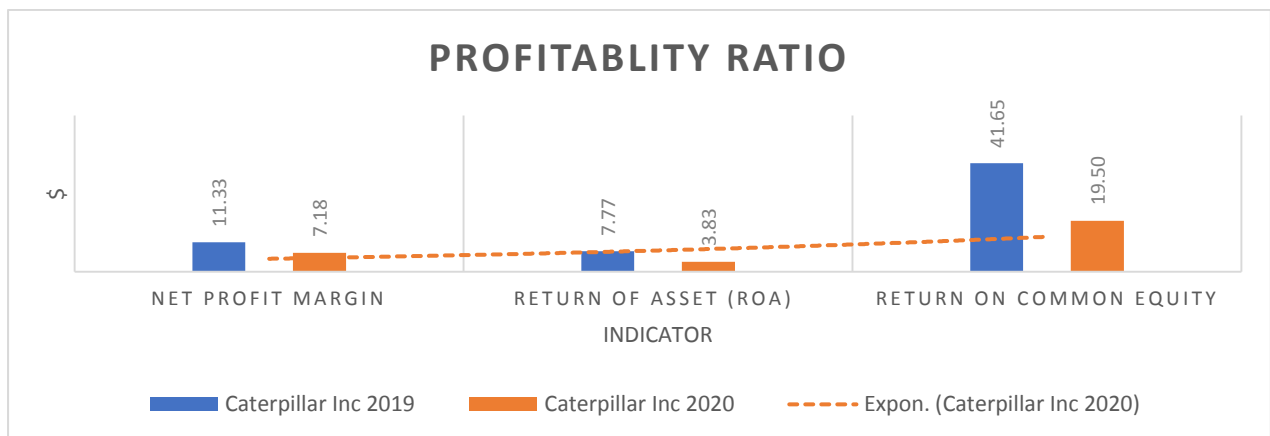


Figure 11: Profitability Ratios

Firstly, the net profit margin in 2019 was \$11.33. That means in that year, every \$100 of sales can generate \$11.33 of net profit. However, in 2020 it becomes \$7.18. It indicates around a 37% drop in net profit.

Secondly, for ROA, it was \$7.77 in 2019. On the other hand, in 2020, it became \$3.83. It means, every \$100 of total assets generated \$3.83. So, here I can clearly say that this ratio is also reduced by more than 50%.

Finally, for ROE, its falls from \$41.65 to \$19.50. It indicates the common shareholders lost their income by 54%. Also, the EPS dropped to \$5.46 from \$10.74

In the end, from the above analysis, we come to the conclusion that the Covid pandemic situation hit very strongly to this company. Nevertheless, the company is very optimistic about its future growth. The reopening of the Chinese market and many European markets gives a positive signal to the company. They believe the Biden administrations might announce some

supportive stimulus packages and new rules that might help them run their business more flexibly.

3.4 Summary & Conclusion:

Multiple Valuation is an essential indicator to find out the actual value of the stock. For this report, by using the multiple valuation approach, I have found out the actual price of the stock and try to compare it with the market price. From the above analysis, I think the market leader of these industries is caterpillar Inc. because its profit margin is higher than the others. As this company is enlisted in the fortune 100 lists, so it has a good reputation in the market. As a result, their stocks have a huge demand in the market. For this reason, during the last two years, the company is overvaluing its stocks. The investors know this company is the top revenue earning company in the USA, so they can easily keep trust in the company. Therefore, by using reputation and fame, the company is enhancing its stock prices. The investors who are willing to earn more profit and take more risk, for them this company is a perfect organization to invest in. On the other hand, the other four companies tend to play on the safe side. They try to undervalue their stock to get more investment. The undervalued stocks are more volatile during the economic recession. However, the whole industry was affected on a large scale by the Covid – 19 pandemics.

3.5 Recommendation:

- For the investors of Caterpillar Inc., my suggestion is, If they own the shares, then they should sell them immediately. If they sell the stock, then they might earn some profit. Since the company has overvalued its share too much, so any sudden economic depression can reduce its value. As a result, the investors might face a huge loss.
- Those who are risk-averse can invest in TAX, HEES & MTW's stock. Because their stocks are undervalued, and sudden economic depression will not affect its investors. However, those who are risk-takers can invest in CAT & ASTE's stocks.
- The companies who have overvalued their stock should address the reason behind that. They should examine, is it their actual value or it is just the bubble in the market. If they have failed to identify that, they might hit hard in the time of economic recession.
- Before investing in any company, the investor should do thoro research about the company. The research may include the company's stock movement analyses and its financial feasibility. Like- how much revenue the company is generating, how much the net profit is fluctuating, its EPS and dividend history, and whether the companies can pay their debt or not. If all the things look satisfactory, then the investor should invest in a particular company.
- The investors should analyse the competitors of the similar industry and try to find out why their focused company seems more attractive than others.
- While buying a share, the investor should look at the actual value of the stock rather than its market value.

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Appendix:

1. Necessary Ratio Calculation:

2020

Year	Ratio	Terex Corp	Caterpillar Inc	H&E Equip Services	Manitowoc Company	Astec Inds Inc	Industry Average
2020	P/EPS	-232.60	33.34	-32.76	-24.20	28.23	-45.60
2020	P/Book Value	3.14	9.65	4.52	0.72	2.04	4.01
2020	P/sales per share	0.94	3.55	0.92	0.32	1.28	1.40
2020	Enterprise value/EBIT	52.84	38.70	37.86	22.17	27.56	35.83
2020	Enterprise Value/EBITDA	30.60	23.26	5.96	11.03	16.95	17.56
2020	Enterprise Value /Sales	1.17	4.22	2.00	0.59	1.16	1.83

2019

Year	Ratio	Terex Corp	Caterpillar Inc	H&E Equip Services	Manitowoc Company	Astec Inds Inc	Industry Average
2019	P/EPS	39.18	13.75	13.81	13.36	42.86	24.59
2019	P/Book Value	2.63	8.23	3.90	0.96	1.57	3.46
2019	P/sales per share	0.56	2.24	0.89	0.34	0.81	0.97
2019	Enterprise value/EBIT	9.86	18.01	13.71	8.77	36.79	17.43
2019	Enterprise Value/EBITDA	8.59	12.84	5.25	6.55	18.00	10.25
2019	Enterprise Value /Sales	0.76	2.77	1.83	0.52	0.79	1.33

2018

Year	Ratio	Terex Corp	Caterpillar Inc	H&E Equip Services	Manitowoc Company	Astec Inds Inc	Industry Average
2018	P/EPS	18.63	12.38	9.59	-7.81	-11.44	4.27
2018	P/Book Value	2.60	7.35	2.84	0.87	1.16	2.97
2018	P/sales per share	0.50	1.89	0.59	0.28	0.58	0.77
2018	Enterprise value/EBIT	8.03	15.91	10.87	-42.97	-8.50	-3.33
2018	Enterprise Value/EBITDA	7.01	11.20	4.48	43.88	-12.56	10.80
2018	Enterprise Value /Sales	0.73	2.41	1.46	0.45	0.63	1.14

2017

Year	Ratio	Terex Corp	Caterpillar Inc	H&E Equip Services	Manitowoc Company	Astec Inds Inc	Industry Average
2017	P/EPS	35.46	125.06	13.24	151.31	35.89	72.19
2017	P/Book Value	5.14	9.33	6.68	2.05	1.97	5.03
2017	P/sales per share	1.66	2.82	1.41	0.88	1.14	1.58
2017	Enterprise value/EBIT	30.09	35.07	17.08	207.38	23.61	62.64
2017	Enterprise Value/EBITDA	23.30	19.59	7.08	35.41	16.12	20.30
2017	Enterprise Value /Sales	1.81	3.44	2.29	1.10	1.11	1.95

2016

Year	Ratio	Terex Corp	Caterpillar Inc	H&E Equip Services	Manitowoc Company	Astec Inds Inc	Industry Average
2016	P/EPS	-19.34	-843.09	22.14	-2.19	28.34	-162.83
2016	P/Book Value	2.69	5.72	5.79	5.66	2.40	4.45
2016	P/sales per share	0.92	1.96	0.85	2.07	1.35	1.43
2016	Enterprise value/EBIT	-40.45	89.30	14.68	-26.50	17.19	10.84
2016	Enterprise Value/EBITDA	-127.19	21.65	5.39	-41.10	13.38	-25.57
2016	Enterprise Value /Sales	1.29	2.69	1.66	2.35	1.31	1.86

2. Calculation of implied Share Price:

For CAT:

2020

Items	Industry Average	Caterpillar Inc. Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	45.60	EPS	5.46	-248.96				-248.96
P/B	4.01	BPS	18.87	75.68				75.68
P/S	1.40	SPS	51.23	71.82				71.82
EV/EBITDA	35.83	EBITDA	7574000000	271356857922	27,877,000,000	243479957922	814,894,624	298.79
EV/EBIT	17.56	EBIT	4553000000	79962129208	27,877,000,000	52085129208	814,894,624	63.92
EV/Sales	1.83	Sales	41748000000	76378590514	27,877,000,000	48501590514	814,894,624	59.52
							Average	53.46

2019

Items	Industry Average	Caterpillar Inc. Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	24.59	EPS	10.74	264.13				264.13
P/B	3.46	BPS	17.95	62.04				62.04
P/S	0.97	SPS	66.02	63.85				63.85
EV/EBITDA	17.43	EBITDA	11621000000	202530197729	28,919,000,000	17361197729	814,894,624	213.05
EV/EBIT	10.25	EBIT	8290000000	84948021340	28,919,000,000	56023021340	814,894,624	68.76
EV/Sales	1.33	Sales	53800000000	71800194030	28,919,000,000	42881194030	814,894,624	52.62
							Average	120.74

2018

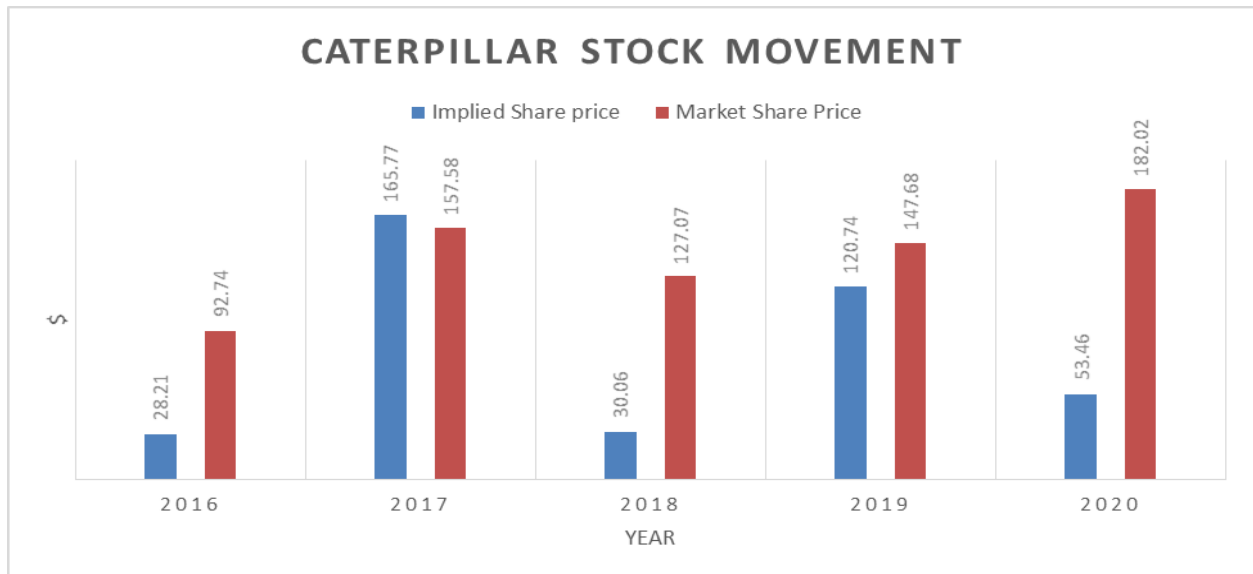
Items	Industry Average	Caterpillar Inc. Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	4.27	EPS	10.26	43.81				43.81
P/B	2.97	BPS	17.28	51.26				51.26
P/S	0.77	SPS	67.15	51.60				51.60
EV/EBITDA	-3.33	EBITDA	11781000000	-39277775577	28354000000	-67631775577	814,894,624	-82.99
EV/EBIT	10.80	EBIT	8293000000	89578961818	28354000000	61224961818	814,894,624	75.13
EV/Sales	1.14	Sales	54722000000	62187030576	28354000000	33833030576	814,894,624	41.52
							Average	30.06

2017

Items	Industry Average	Caterpillar Inc. Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	72.19	EPS	1.26	90.96				90.96
P/B	5.03	BPS	16.89	85.04				85.04
P/S	1.58	SPS	55.79	88.21				88.21
EV/EBITDA	62.64	EBITDA	7983000000.00	500083901207	28,004,000,000	472079901207	814,894,624	579.31
EV/EBIT	20.30	EBIT	4460000000.00	90536648371	28,004,000,000	62532648371	814,894,624	76.74
EV/Sales	1.95	Sales	45462000000.00	88605965875	28,004,000,000	60601965875	814,894,624	74.37
							Average	165.77

2016

Items	Industry Average	Caterpillar Inc. Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-162.83	EPS	-0.11	17.91				17.91
P/B	4.45	BPS	16.21	72.18				72.18
P/S	1.43	SPS	47.29	67.67				67.67
EV/EBITDA	10.84	EBITDA	4792000000	51959460526	28,191,000,000	23768460526	814,894,624	29.17
EV/EBIT	-25.57	EBIT	1162000000	-29716943073	28,191,000,000	-57907943073	814,894,624	-71.06
EV/Sales	1.86	Sales	38537000000	71688073466	28,191,000,000	43497073466	814,894,624	53.38
							Average	28.21



For TEX:

2020

Items	Industry Average	TEREX CORP Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-46.60	EPS	-0.15	6.84				6.84
P/B	4.01	BPS	11.12	44.58				44.58
P/S	1.40	SPS	37.11	52.03				52.03
EV/EBITDA	35.83	EBITDA	118100000	4231219531.37	722,000,000	3509219531	82,900,000	42.33
EV/EBIT	17.56	EBIT	68400000	1201276002.16	722,000,000	479276002	82,900,000	5.78
EV/Sales	1.83	Sales	3076400000	5628319820.29	722,000,000	4906319820	82,900,000	59.18
							Average	35.12

2019

Items	Industry Average	TEREX CORP Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	24.59	EPS	0.76	18.69				18.69
P/B	3.46	BPS	11.34	39.20				39.20
P/S	0.97	SPS	52.96	51.21				51.21
EV/EBITDA	17.43	EBITDA	384600000	6702789265	855,800,000	5846989265	82,200,000	71.13
EV/EBIT	10.25	EBIT	335000000	3432760814	855,800,000	2576960814	82,200,000	31.35
EV/Sales	1.33	Sales	4363100000	5809543209	855,800,000	4953743209	82,200,000	60.26
							Average	45.31

2018

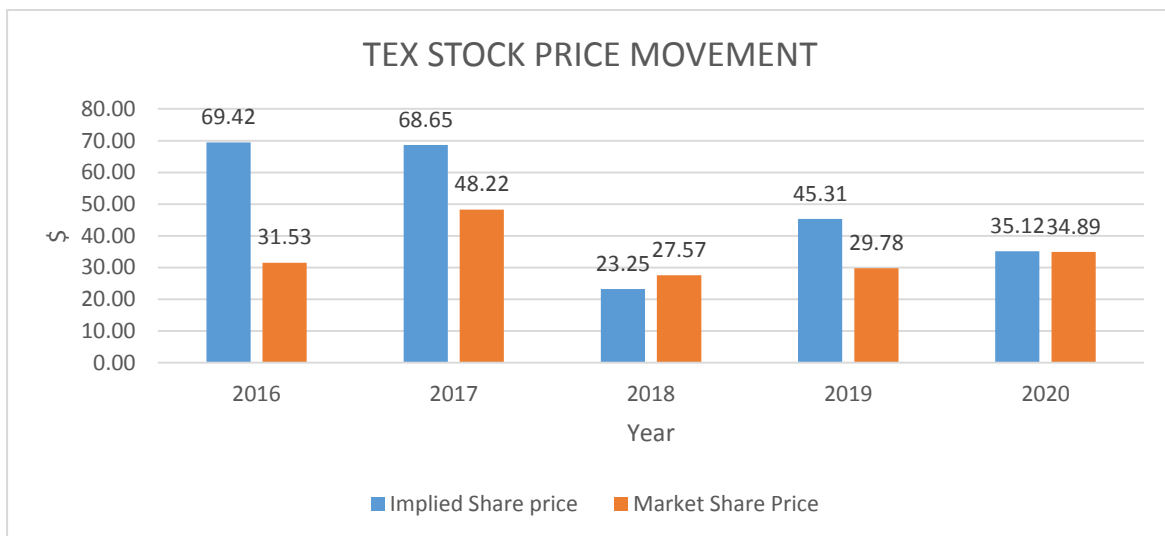
Items	Industry Average	TEREX CORP Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	4.27	EPS	1.48	6.32				6.32
P/B	2.97	BPS	10.59	31.42				31.42
P/S	0.77	SPS	55.56	42.70				42.70
EV/EBITDA	-3.33	EBITDA	472200000	-1574311657	1070700000	-2645011657	81,300,000	-32.53
EV/EBIT	10.80	EBIT	412500000	4455724316	1070700000	3385024316	81,300,000	41.64
EV/Sales	1.14	Sales	4517200000	5133424482	1070700000	4062724482	81,300,000	49.97
							Average	23.25

2017

Items	Industry Average	TEREX CORP Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	72.19	EPS	1.36	98.18				98.18
P/B	5.03	BPS	9.38	47.19				47.19
P/S	1.58	SPS	29.09	46.00				46.00
EV/EBITDA	62.64	EBITDA	294700000.00	18461070485	578,000,000	17883070485	130,400,000	137.14
EV/EBIT	20.30	EBIT	228200000.00	4632390843	578,000,000	4054390843	130,400,000	31.09
EV/Sales	1.95	Sales	3793700000.00	7393965350	578,000,000	6815965350	130,400,000	52.27
Average								68.65

2016

Items	Industry Average	TEREX CORP Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-162.83	EPS	-1.63	265.41				265.41
P/B	4.45	BPS	11.74	52.25				52.25
P/S	1.43	SPS	34.28	49.06				49.06
EV/EBITDA	10.84	EBITDA	-45100000	-489017460	1,650,100,000	-2139117460	129,600,000	-16.51
EV/EBIT	-25.57	EBIT	-141800000	3626387718	1,650,100,000	1976287718	129,600,000	15.25
EV/Sales	1.86	Sales	4443100000	8265232873	1,650,100,000	6615132873	129,600,000	51.04
Average								69.42



For HEES:

2020

Items	Industry Average	H&E Equip Services Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-45.60	EPS	-0.91	41.49				41.49
P/B	4.01	BPS	6.60	26.47				26.47
P/S	1.40	SPS	32.39	45.41				45.41
EV/EBITDA	35.83	EBITDA	392647000	14067533068.03	1,265,014,000	12802519068	36,092,555	354.71
EV/EBIT	17.56	EBIT	61824000	1085784905.82	1,265,014,000	-179223094	36,092,555	-4.97
EV/Sales	1.83	Sales	1169120000	2138922529.03	1,265,014,000	873908529	36,092,555	24.21
							Average	81.22

2019

Items	Industry Average	H&E Equip Services Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	24.59	EPS	2.42	59.51				59.51
P/B	3.46	BPS	8.58	29.65				29.65
P/S	0.97	SPS	37.61	36.37				36.37
EV/EBITDA	17.43	EBITDA	470332000	8196922206	1,271,260,000	6925662206	35,848,089	193.19
EV/EBIT	10.25	EBIT	180161000	1846118272	1,271,260,000	574858272	35,848,089	16.04
EV/Sales	1.33	Sales	1348365000	1799495699	1,271,260,000	528235699	35,848,089	14.74
							Average	58.25

2018

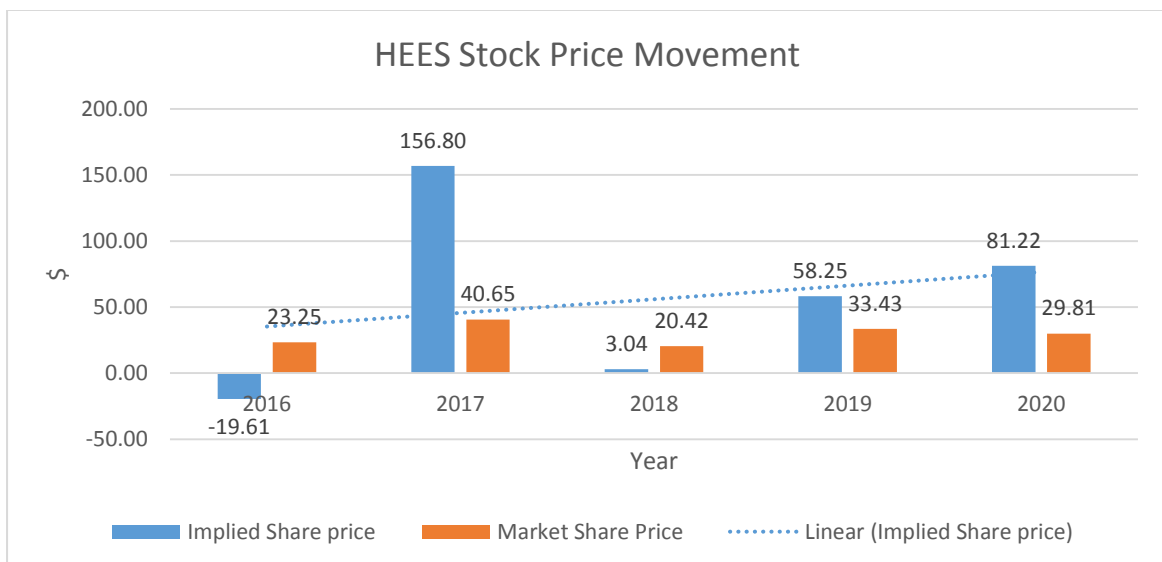
Items	Industry Average	H&E Equip Services Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	4.27	EPS	2.13	9.10				9.10
P/B	2.97	BPS	7.19	21.32				21.32
P/S	0.77	SPS	34.67	26.64				26.64
EV/EBITDA	-3.33	EBITDA	404572000	-1349840355	1081942000	-2430782355	35,733,569	-68.03
EV/EBIT	10.80	EBIT	166646000	1800069417	1081942000	718127417	35,733,569	20.10
EV/Sales	1.14	Sales	1238961000	1407976784	1081942000	326034784	35,733,569	9.12
							Average	3.04

2017

Items	Industry Average	H&E Equip Services Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	72.19	EPS	3.07	221.63				221.63
P/B	5.03	BPS	6.08	30.61				30.61
P/S	1.58	SPS	28.90	45.69				45.69
EV/EBITDA	62.64	EBITDA	332480000.00	20827745894	906,115,000	19921630894	35,646,585	558.87
EV/EBIT	20.30	EBIT	137915000.00	2799632704	906,115,000	1893517704	35,646,585	53.12
EV/Sales	1.95	Sales	1030019000.00	2007518991	906,115,000	1101403991	35,646,585	30.90
Average								156.80

2016

Items	Industry Average	H&E Equip Services Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-162.83	EPS	1.05	-170.97				-170.97
P/B	4.45	BPS	4.02	17.87				17.87
P/S	1.43	SPS	27.51	39.37				39.37
EV/EBITDA	10.84	EBITDA	301684000	3271147306	799,567,000	2471580306	35,554,491	69.52
EV/EBIT	-25.57	EBIT	110767000	-2832750975	799,567,000	-3632317975	35,554,491	-102.16
EV/Sales	1.86	Sales	978137000	1819569689	799,567,000	1020002689	35,554,491	28.69
Average								-19.61



For MTW:

2020

Items	Industry Average	Manitowoc Company Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-45.60	EPS	-0.55	25.08				25.08
P/B	4.01	BPS	18.61	74.62				74.62
P/S	1.40	SPS	41.74	58.52				58.52
EV/EBITDA	35.83	EBITDA	7760000	2780208599.78	395,500,000	2384708600	34,580,638	68.96
EV/EBIT	17.56	EBIT	38600000	677913065.55	395,500,000	282413066	34,580,638	8.17
EV/Sales	1.83	Sales	1443400000	2640721892.02	395,500,000	2245221892	34,580,638	64.93
							Average	50.05

2019

Items	Industry Average	Manitowoc Company Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	24.59	EPS	1.31	32.22				32.22
P/B	3.46	BPS	18.26	63.10				63.10
P/S	0.97	SPS	51.85	50.14				50.14
EV/EBITDA	17.43	EBITDA	145200000	2530538225	331,600,000	2198938225	35,374,537	62.16
EV/EBIT	10.25	EBIT	108400000	1110779917	331,600,000	779179917	35,374,537	22.03
EV/Sales	1.33	Sales	1834100000	2447746020	331,600,000	2116146020	35,374,537	59.82
							Average	48.24

2018

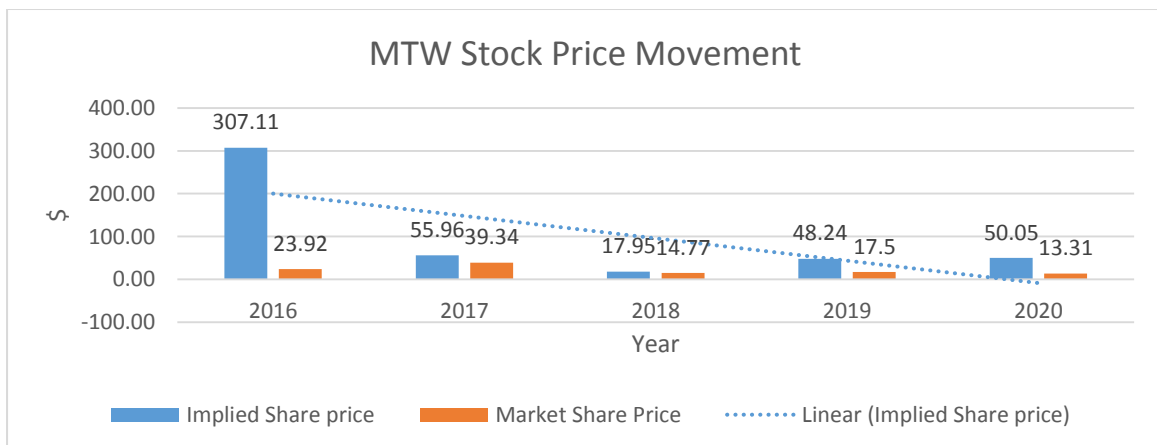
Items	Industry Average	Manitowoc Company Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	4.27	EPS	-1.89	-8.07				-8.07
P/B	2.97	BPS	16.90	50.13				50.13
P/S	0.77	SPS	51.89	39.88				39.88
EV/EBITDA	-3.33	EBITDA	18900000	-63012474	303700000	-366712474	35,588,833	-10.30
EV/EBIT	10.80	EBIT	-19300000	-208473889	303700000	-512173889	35,588,833	-14.39
EV/Sales	1.14	Sales	1846800000	2098735574	303700000	1795035574	35,588,833	50.44
							Average	17.95

2017

Items	Industry Average	Manitowoc Company Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	72.19	EPS	0.26	18.77				18.77
P/B	5.03	BPS	19.21	96.68				96.68
P/S	1.58	SPS	44.83	70.88				70.88
EV/EBITDA	62.64	EBITDA	49200000.00	3082065381	354,300,000	2727765381	35,273,864	77.33
EV/EBIT	20.30	EBIT	8400000.00	170517454	354,300,000	-183782546	35,273,864	-5.21
EV/Sales	1.95	Sales	1581300000.00	3081972061	354,300,000	2727672061	35,273,864	77.33
Average								55.96

2016

Items	Industry Average	Manitowoc Company Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-162.83	EPS	-10.91	1776.45				1776.45
P/B	4.45	BPS	4.22	18.80				18.80
P/S	1.43	SPS	11.54	16.51				16.51
EV/EBITDA	10.84	EBITDA	-92200000	-999720839	444,600,000	-1444320839	139,841,214	-10.33
EV/EBIT	-25.57	EBIT	-143000000	3657076471	444,600,000	3212476471	139,841,214	22.97
EV/Sales	1.86	Sales	1613100000	3000753336	444,600,000	2556153336	139,841,214	18.28
Average								307.11



For ASTE:

2020

Items	Industry Average	Astec Inds Inc Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-45.60	EPS	2.05	-93.47				-93.47
P/B	4.01	BPS	28.44	114.04				114.04
P/S	1.40	SPS	45.30	63.51				63.51
EV/EBITDA	35.83	EBITDA	69900000	2504337385.63	-123,700,000	2628037386	22,611,976	116.22
EV/EBIT	17.56	EBIT	43000000	755188130.02	-123,700,000	878888130	22,611,976	38.87
EV/Sales	1.83	Sales	1024400000	1874155124.14	-123,700,000	1997855124	22,611,976	88.35
							Average	54.59

2019

Items	Industry Average	Astec Inds Inc Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	24.59	EPS	0.98	24.10				24.10
P/B	3.46	BPS	26.71	92.32				92.32
P/S	0.97	SPS	51.86	50.16				50.16
EV/EBITDA	17.43	EBITDA	51300000	894053794	-23,600,000	917653794	22,551,183	40.69
EV/EBIT	10.25	EBIT	25100000	257200885	-23,600,000	280800885	22,551,183	12.45
EV/Sales	1.33	Sales	1169600000	1560920203	-23,600,000	1584520203	22,551,183	70.26
							Average	48.33

2018

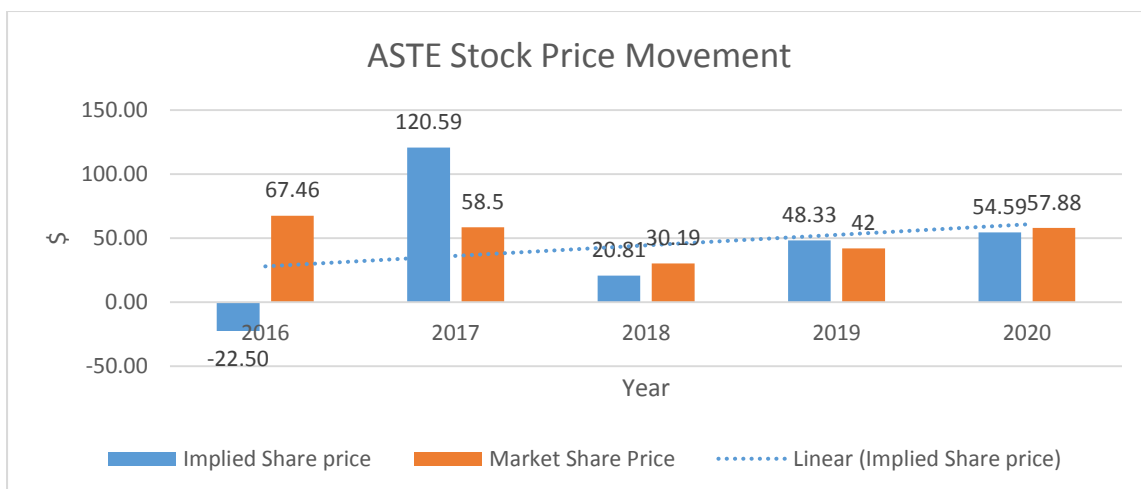
Items	Industry Average	Astec Inds Inc Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	4.27	EPS	-2.64	-11.27				-11.27
P/B	2.97	BPS	26.00	77.13				77.13
P/S	0.77	SPS	52.04	39.99				39.99
EV/EBITDA	-3.33	EBITDA	-58500000	195038611	55115000	139923611	22,513,000	6.22
EV/EBIT	10.80	EBIT	-86400000	-933271711	55115000	-988386711	22,513,000	-43.90
EV/Sales	1.14	Sales	1171600000	1331426575	55115000	1276311575	22,513,000	56.69
							Average	20.81

2017

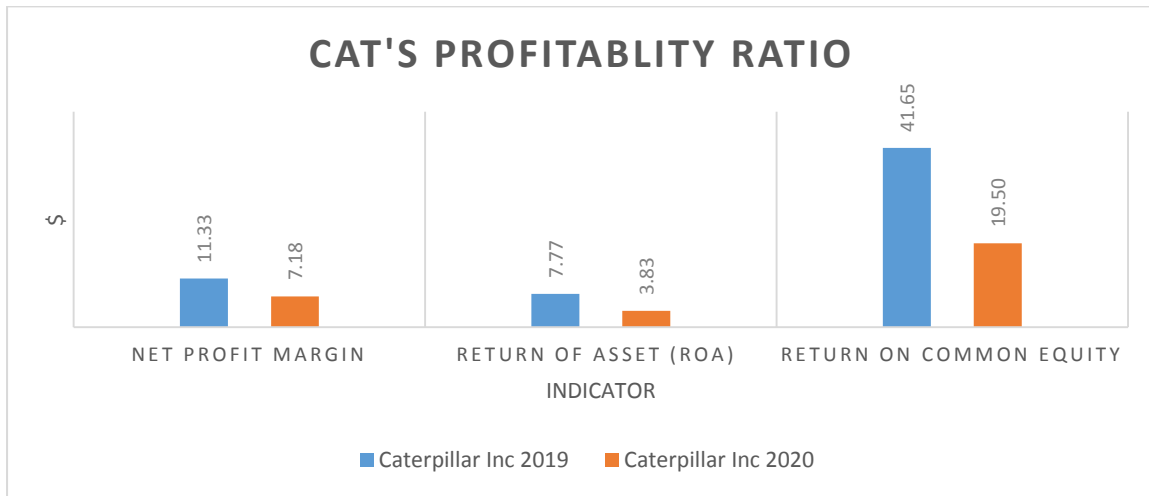
Items	Industry Average	Astec Inds Inc Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	72.19	EPS	1.63	117.67				117.67
P/B	5.03	BPS	29.77	149.85				149.85
P/S	1.58	SPS	51.35	81.20				81.20
EV/EBITDA	62.64	EBITDA	81339000.00	5095368212	-38,612,000	5133980212	23,070,000	222.54
EV/EBIT	20.30	EBIT	55537000.00	1127394269	-38,612,000	1165996269	23,070,000	50.54
EV/Sales	1.95	Sales	1184739000.00	2309070067	-38,612,000	2347682067	23,070,000	101.76
Average								120.59

2016

Items	Industry Average	Astec Inds Inc Metric		Implied Price or EV	Less: Net Debt	Implied Equity Value	Number of Outstanding Shares	Implied Share price
P/E	-162.83	EPS	2.38	-387.53				-387.53
P/B	4.45	BPS	28.15	125.32				125.32
P/S	1.43	SPS	49.79	71.24				71.24
EV/EBITDA	10.84	EBITDA	111968000	1214064457	-56,472,000	1270536457	23,046,000	55.13
EV/EBIT	-25.57	EBIT	87155000	-2228898600	-56,472,000	-2172426600	23,046,000	-94.26
EV/Sales	1.86	Sales	1147431000	2134497180	-56,472,000	2190969180	23,046,000	95.07
Average								-22.50



3. Profitability Ratio Analysis for Caterpillar Inc.: (2019 – 2020)



4. Quarterly Revenue & Net Income Comparison for CAT (2020):

