SUMMER INTERNSHIP REPORT

FINAL REPORT

Topic: Enterprise Risk Management

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Executive Summary

In India, all the industries are exposed to many predictable and unpredictable risks all through its business cycle, which might have an immense effect on the performance of the company. To attend such uncertainties, SEBI has made it compulsory for the companies to have a risk management policy and a risk management committee. Many top companies have adopted internationally accepted Enterprise Risk Management framework, to have a positive impact on its financials and non- financials and increase its value among stakeholders. This study examines the determinants and effects of ERM adoption for 15 companies in 3 different industries which are listed in Indian stock exchanges. It further examines what is the effect of ERM framework on the performance of the company, how the companies have implemented the framework in its organisation and how its competitors have implemented. Based on it which framework has generated better results and how it helped in the decision making process of the company.

Introduction

The businesses are getting affected by numerous volatility and complexities of risks are growing continuously with the current trends, globalisation, China-US trade war and now the Covid-19 pandemic which resulted in a complete nationwide lockdown and a halt of business for almost 2 months there is huge uncertainty and high risk in many industries and business environment. From the financial crisis of 2008, and now the ongoing Covid-19 Pandemic volatilities are going to see a rise in companies going for Enterprise Risk Management. Traditionally, whenever there were risks in the company it used to be managed by the company's respective functional managers independently, but in actual, this risk management model cannot identify that different risks can combine to hinder achievements of the company or else overlap to cancel each other. The ERM framework mitigates it by taking a holistic, broad, strategic, and top-down approach in managing risks. Through the ERM framework the decision making in daily operations, reporting, strategy making or compliance it combines it along with risk management. In this, the risks involved at all levels can be managed in the organisation.

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) defines Enterprise Risk Management as

"A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives."[1]

Many organisations are showing interest in ERM and following them, but academic research is not growing. And, many rating agencies while calculating the credit rating of the company is also taking into consideration the company's ERM strength. It provides to give the company a long competitive advantage over other companies in terms of the trade-off between risks and return which further improves its value.

With the rise in globalization, many companies all over the world are expanding their mode of operations into many locations and are also getting themselves listed in their foreign exchanges. Because of this, the companies have many risks due to different cultural, political, economic

[1] https://www.coso.org/Pages/erm.aspx

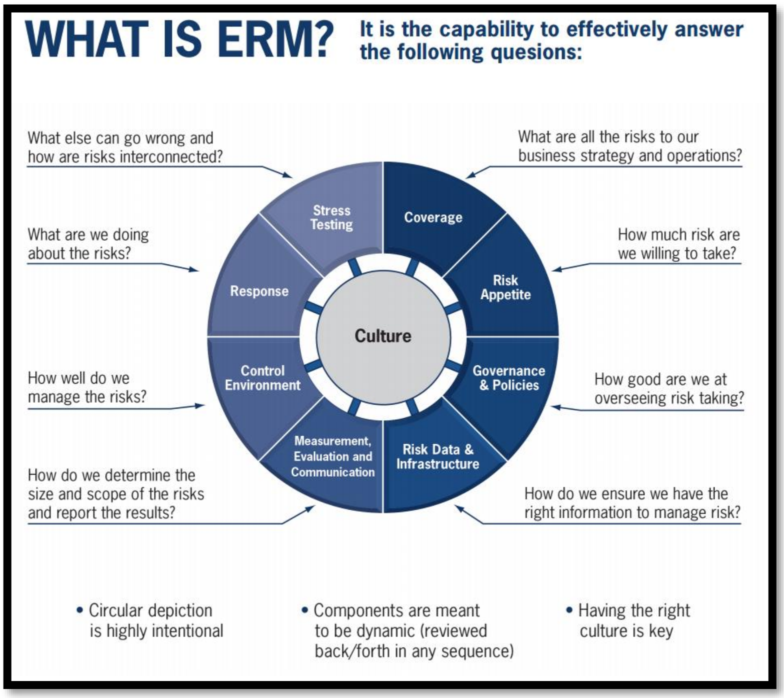
and many other global uncertainties. And so, for the companies to adhere and sustain in this situation they must adopt ERM framework for success.

As per the framework the ERM helps in getting the answers for three basic business questions:

1. Should the company take up that work? (this helps in knowing whether it is aligned with the organisation's strategy, the risk appetite of the organisation, culture and values and ethics of the management)
2. Can the organisation do the work? (this helps in assessing the people working, the structure of the organisation and finally the technological capabilities of the organisation)
3. Did the company do it? (This helps in assessing the previous results of the organisation's performance, the future expected results and the robust system of checks and balances of the company)

According to the ERM framework, it says that the culture of the top management of the organization is the main factor which affects the organisation's risk and so it lies in the centre of the framework. The remaining which have effects on the risks are classified are in the following framework figure.

Figure 1.1[2]



[2] https://www.rmahq.org/erm-framework/

Objective

To know the concept of Enterprise Resource Management Framework and how it affects the company when they adopt it and do a comparative study based on qualitative as well as quantitative parameters.

Factors Identified Influencing ERM In A Company

There are many factors which have directly influenced the company's adoption of ERM framework.

1. **Profitability**- As a company is more profitable then it has more chances to create assets which can stand out compared to its peers. So, the company needs to follow ERM to successfully mitigate the risks associated.
2. **Size**- As, when the companies grow with their growth they get more economies of scale in its operations, with it the volume also increases and also the complexity associated with it, so to manage it the ERM needs to be followed.
3. **The volatility of Stock Returns-** If the stock returns are very cyclical then the stocks are very volatile and uncertain and that they are facing greater risks. So to minimize the risks the companies can follow ERM.
4. **Firm complexity**—When the company have many businesses under its head like Reliance then they have many complexities. These companies face many integration and coordination challenges which weakens the internal control of the company. The companies must follow ERM to mitigate the risks.
5. **Leverage-** When the company have greater leverage, they face more financial risks. And, with there are chances of default or bankruptcy if the risks are not attended properly and for that ERM adoption eases the operation.

Research Methodology

Learning the concept of ERM framework and then selecting 2 industries and 5 companies in each industry and studying how the companies have implemented the ERM and how it has affected the company. Doing the qualitative and quantitative analysis by doing regression on taking the above factors.

Analysis

Industry 1: IT Industry

Company 1: Infosys Limited

Company Overview:

Infosys Limited is an Indian MNC, its businesses are outsourcing its services, proving business consulting, and IT services. Its headquarters is in Bangalore which itself is known as the IT hub of India or Silicon Valley of India. It is the second biggest Indian Information Technology based company after TCS based on its revenue. It has almost more than 2,40,000 employees working in the organisation. It was founded by 7 people in 1981 and N. R Narayana Murthy was its first CEO.

Definition and Categorisation of Risk

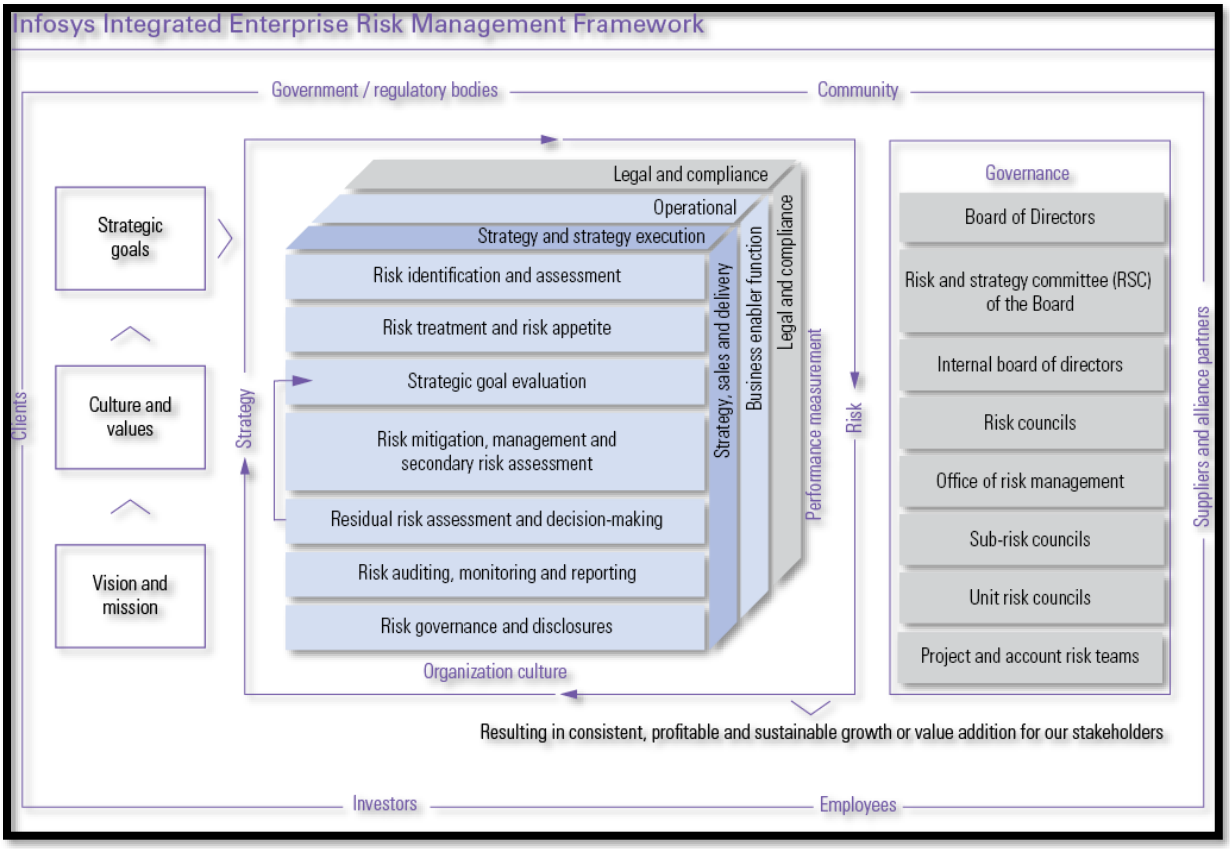
According to Infosys ERM framework, they have identified that it helps in enabling of achieving the strategic objectives by identification of the risk or potential threat to these objectives, assessing them, then mitigating it, and later monitoring and governing it. For the company, the strategic objectives are its key driver, its customers, obligations and commitment to its employees, investors, partners, its values, regulatory bodies, culture and community around it is the foundation is what its ERM framework is developed.

Approach to ERM

The company's ERM framework is based on international standards and tailored to suit its business needs made by its risk management office. They have taken into account all its risks which they are facing under different categories like operational, strategic, and legal and compliance risks. And, that any of these categories may have internal or external dimensions and that relevant risk indicator are used to identify risks proactively. Its ERM unit functions as if a decision enabler which seeks to minimize the impact of the risks and also enables effective and efficient resource allocation based on its risk impact ranking and its risk appetite.

Strategy and Objective setting of Infosys Enterprise Risk Management

Figure 1[3]

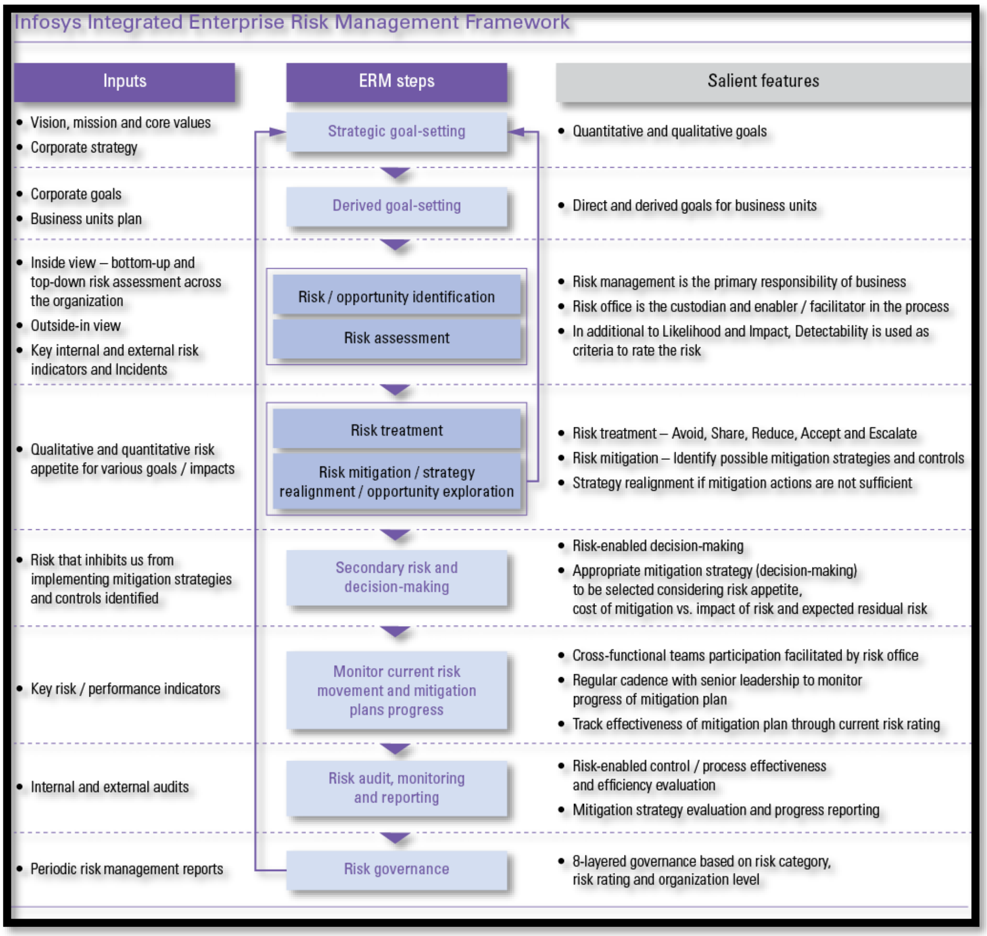


1. Strategic Goal setting
2. Derived goal setting
3. Risk/operational identification
4. Risk assessment
5. Risk treatment
6. Risk mitigation/ strategy realignment/ opportunity exploration
7. Secondary risk and decision making
8. Monitor current risk movement and mitigation plans progress
9. Risk audit, monitoring and reporting
10. Risk governance

These have been explained briefly in the below diagram.

[3]https://www.infosys.com/content/dam/infosys-web/en/investors/reports-filings/annual-report/annual/documents/ar-2018/risk-management-report.html

Figure 2[4]



Key Risks:

The key risks identified by the company are

i. Market Fluctuations
ii. Financial Risks
iii. Regulatory Risks
iv. Operational Risks and
v. Social Risks

Governance and Oversight

The risks are identified by the risk management functions or roles at different levels in the organization are presented at appropriate councils in the governance structure. Critical risks or cross-functional risks at each level are escalated to the next level in the governance structure.

[4] https://www.infosys.com/content/dam/infosys-web/en/investors/reports-filings/annual-report/annual/documents/ar-2018/risk-management-report.html

Critical risks under different categories of risks at the group level are reviewed by the CEO, COO, CFO, CRO and General Counsel in various councils. Critical risks from these councils are presented to the Internal Board of Directors and then to the risk and strategy committee of the Board every quarter.

Quantitative Analysis

Leverage- total assets/net worth (shareholders fund is the net worth)

Liquidity- Net cash flow from operating activities/ total assets

Profitability- Return on assets

The volatility of Stock returns- Standard deviation of annual stock returns over a 5-year preceding the current year.

Table 1

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	4.96	84738	64948	1.304705303	18.17
2018	3.8	79890	64923	1.230534633	20.06
2017	3.39	83355	68982	1.208358702	17.21
2016	4.51	75350	61744	1.220361493	17.9
2015	5	66289	50736	1.306547619	18.66

Table 2

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	661	731.75	10.70347958	8.888119679	3.295531559	11.54508412
2018	520	659.85	26.89423077	8.888119679	324.2200366	11.54508412
2017	506	519.65	2.697628458	8.888119679	38.32218155	11.54508412
2016	550	505.35	-8.118181818	8.888119679	289.2142906	11.54508412
2015	491.95	552.28	12.26344141	8.888119679	11.39279677	11.54508412

Company 2: Mindtree Limited

Company Overview

Mindtree Limited is an Indian MNC which deals in IT and outsourcing. It is headquartered in Bangalore, India and New Jersey, USA. It has been founded in 1999 and now is owned by L&T Group. Many of its clients are cloud computing, e-commerce, digital transformations, mobile apps, enterprise application integration, ERP and data analytics.

Definition and Categorisation of Risk

The company identifies the ERM framework as an essential and important tool to properly analyse the risks to the sustainability and scalability of the company so that it can achieve its business target of gaining value for its stakeholders.

Approach to ERM

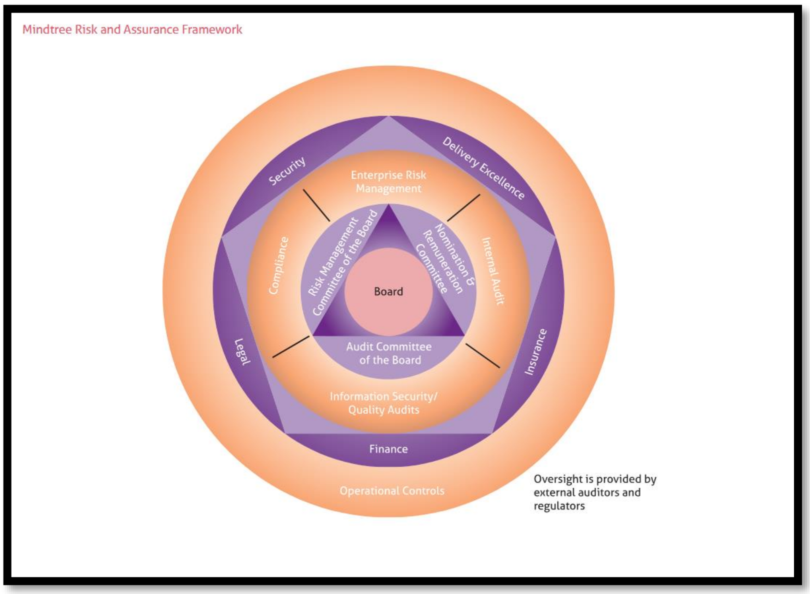
The organisation uses the framework to continuously identify, assess, treat, monitor, and report the potential risks which might arise, and to create a risk awareness culture within the whole organisation. The organisation's ERM framework has been designed by following and according to the leading risk management standards such as COSO Enterprise Risk Management, and IRM Risk Management Standard. The company has appointed Chief Risk Officer to be the custodian of the framework and even Risk Management Committee is also formed.

Strategy and Objective setting

Unlike Infosys Risk Management framework, the Mindtree has adopted a multi-layer integrated risk framework. The strategy adopted by the company is

i. Key business goals
ii. Risk identification
iii. Risk assessment
iv. Risk treatment
v. Monitoring & reporting

Figure 3:



Key Risks:

The key risks identified by the company are

1. Strategic Risks, like competition, industry changes etc

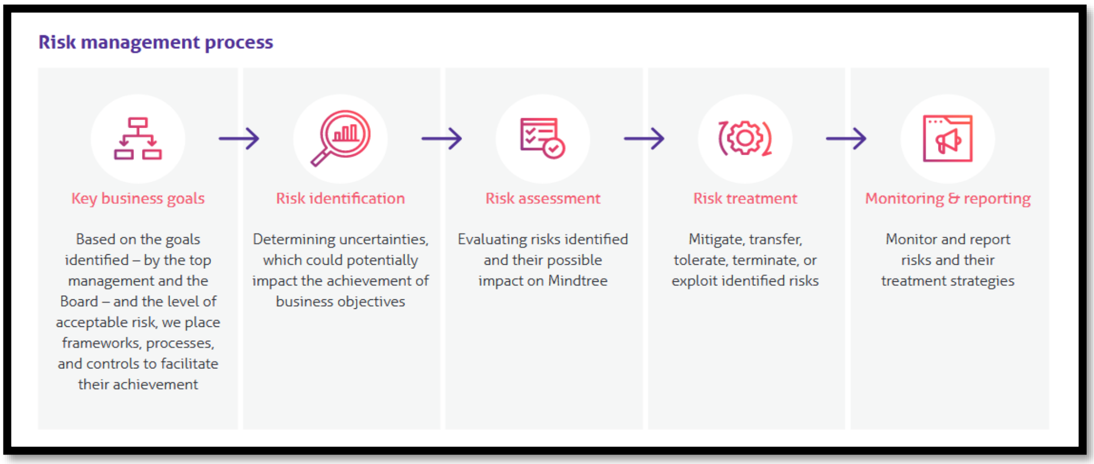
2. Operational Risks, like immigration, BCP, fraud etc.

3. Compliance and Internal control Risks

4. Contractual and counter party risks

5. Environment and market risks

Figure 4[5]



[5] https://www.mindtree.com/sites/default/files/2019-06/annual-report-2018-19.pdf

Governance and Oversight:

The whole Framework implementation is governed by the BOD through the Risk Management Committee of the Board. The organisation's RMC has 3 Executive Directors including Executive Chairman, CEO, Executive Vice Chairman, and an Independent Director. The company has structured the committee such a way that for any potential risk it has a designated risk owner who takes up the charge and responsibility for that risk treatment as per its policy. And the Risk Management Committee has a review meeting every quarter to discuss the risks and their respective treatment plan which have emerged during the period.

Quantitative Analysis

Table 3

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets
2019	4.69	4179	3306.1	1.264027101	18.04
2018	4.63	3736.5	2741.4	1.362989713	15.25
2017	2.95	3390.6	2577.1	1.315664895	12.34
2016	4.53	3276.9	2414.9	1.356950598	16.86
2015	5.43	2654.9	2012.4	1.319270523	20.2

Table 4

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns(AR)	(ARR-AR)^2	Standard Deviation
2019	856.5	799.2	-6.69	6.78941	181.695	23.0237
2018	612.05	863.35	41.0587	6.78941	1174.39	23.0237
2017	524.15	610.1	16.398	6.78941	92.3246	23.0237
2016	721.1	521.75	-27.645	6.78941	1185.75	23.0237
2015	648	718.15	10.8256	6.78941	16.291	23.0237

Company 3: Wipro

Company Overview

Western India Palm Refined Oil Limited, now which is known as Wipro Limited is an Indian MNC which deals in services like IT, business consulting and process services. It is headquartered in the Indian Silicon Valley city Bangalore. Recently in 2013, it has separated its non-IT business services and formed Wipro Enterprises. The company was incorporated by Mohammed Premji in 1945 who is also known for his philanthropies and his simplicity. The company's primary business during that period was manufacturing vegetable and refined oils and later expanded its businesses and operations into many fields.

Definition and Categorisation of Risk

Wipro identifies that the main risks which are a threat for the organisation are the daily update in the technology of Information Security and Business Continuity, Cybersecurity, Data Privacy and Large Deal Execution. And to mitigate these risks the company has employed a risk management framework so that it can proactively identify, prioritize, and mitigate the risks.

Approach to ERM

The organisation's ERM framework has been based on the principles laid out by 4 globally recognized risk management standards ISO – ISO 31000:2018, COSO ERM framework, Orange Book by UK Government Treasury, and AS/NZS ISO 31000:2009 Risk Management.

Strategy and Objective setting

The strategy used by Wipro to mitigate risks are

i. Risk identification
ii. Risk Analysis
iii. Risk Evaluation
iv. Risk Treatment and
v. Risk Monitoring.

Figure 5[6]

Key Risks:

i. Business Continuity and Disaster Risks
ii. Cyber Risks
iii. Intellectual Property Infringement Risks
iv. Employee Health and Safety related risks
v. Large Program Risks
vi. Proactive fraud risks
vii. Stress testing Risks

Governance and Oversight:

The whole Framework implementation is governed by the BOD through the Risk Management Committee of the Board, and also the audit committee of the board. The Risk Management Committee has a review meeting every quarter to discuss the risks and their respective treatment plan which have emerged during the period.

6 https://www.wipro.com/content/dam/nexus/en/investor/annual-reports/2018-2019/annual-report-for-fy-2018-19.pdf

Quantitative Analysis

Table 5

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	2.72	82924.8	56422.6	1.469708946	10.85
2018	2.66	75693.3	47926.3	1.579368739	10.57
2017	2.42	78982	51670.2	1.528579336	10.75
2016	3.02	72019.2	46144.8	1.560721901	12.36
2015	4.18	58376.8	37092	1.573838024	14.83

Table 6

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	250.9	246	-1.965082908	4.308510084	39.35796903	15.42181375
2018	235.1	247.7	5.377579238	4.308510084	1.142908857	15.42181375
2017	178.1	235.1	31.95419076	4.308510084	764.28366	15.42181375
2016	209.3	177.8	-15.05376344	4.308510084	374.8976361	15.42181375
2015	207.4	209.9	1.229626772	4.308510084	9.47952245	15.42181375

Company 4: Tech Mahindra Limited

Company Overview

Tech Mahindra is an Indian MNC which is a subsidiary of the Mahindra Group. Its main business offerings are BPO services and IT services to various companies. In 2013, Tech Mahindra acquired Satyam. The company is chaired by Anand Mahindra and it is headquartered in Pune. It has its operations spread across 90 countries and is ranked 5th among Indian IT firms.

Definition and Categorisation of Risk

Tech Mahindra defines Risk management as a mechanism which helps in identifying, classifying, and managing financial and non-financial risks by thoroughly analysing every risk possibility, in short, medium, and long run. Some of the risks which are identified by the company are High concentration in communication vertical, global economy risk, Mergers and acquisition and integration risks, competitors' risk, cybersecurity risk, litigation risk, technology risk, supply-side risks etc.

Reporting risk helps to integrate them into management decision making and ensure business continuity. It also provides opportunities for improvement; internal innovation; and development of new solutions that can give us a competitive advantage.

Approach to ERM

The approach to risk management is early-stage identification, communication, and management. Risk management includes focused actions like strengthening operational controls; deploying business continuity and disaster recovery; building business resilience; conducting associate awareness on risks and identifying business opportunities.

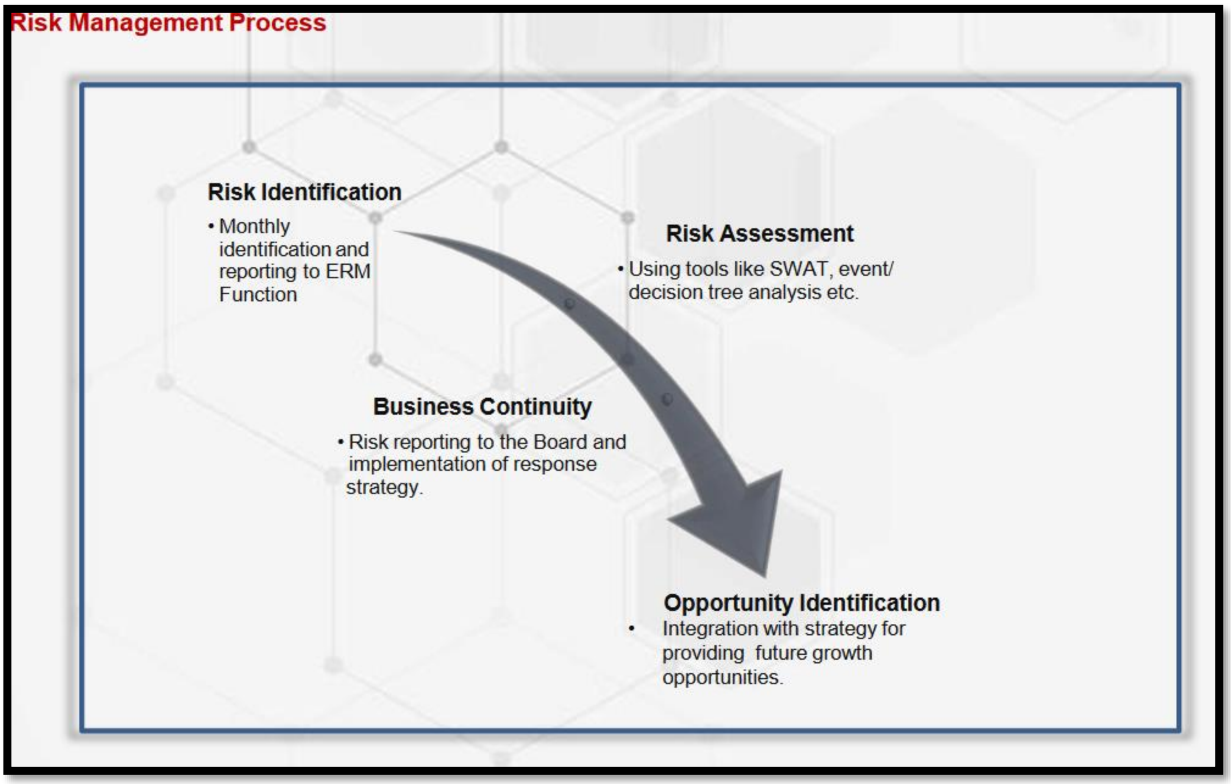
The organisation uses the framework to continuously identify, assess, treat, monitor, and report the potential risks which might arise, and to create a risk awareness culture within the whole organisation.

Strategy and Objective setting

The strategy implemented by Tech Mahindra is

i. Risk identification
ii. Risk assessment
iii. Business Continuity
iv. Opportunity Identification

Figure 6[7]



Key Risks:

The risks identified by Tech Mahindra are

i. Cyber-attack risks
ii. Financial risks
iii. Global economy risks
iv. Mergers and acquisitions and integration risk
v. Competition risks
vi. Currency risks

[7] https://cache.techmahindra.com/static/img/pdf/Integrated-Report-19.pdf

vii. Data privacy risks
viii. Litigation risks
ix. Technology risks
x. Supply side and employee related risks

Governance and Oversight:

Risk Management Approach Risk assessment is entrusted with ERM Team in conjunction with various business functions. Chief Risk Officer heads, ERM function & all business functions have a designated Risk officer. ERM Council report to the Risk Management Committee at the Board Level enabling Board to be conversant to all risks that directly or indirectly have the potential to affect Tech Mahindra's Business, operations, Brand and Reputation. All Risks, impacts and strategies are reported to the Board each quarter and are set out in the Management Discussion and Analysis Section of the Annual Report.

Quantitative Analysis

Table 7

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	3.4	33446.9	20282.4	1.649060269	12.84
2018	2.99	30437.2	18840.4	1.615528333	12.48
2017	2.45	26066.5	16435.2	1.586016599	10.79
2016	2.84	22524.7	14589.5	1.543898009	13.28
2015	4.94	19848.1	12248.6	1.620438254	13.23

Table 8

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	715	762.6	6.657342657	5.364633492	1.671096986	21.36774372
2018	500	721.1	44.22	5.364633492	1509.739506	21.36774372
2017	494	503.9	1.993927126	5.364633492	11.36166141	21.36774372
2016	523	488.7	-6.549383306	5.364633492	141.9437963	21.36774372
2015	647.9	521.6	-19.49871902	5.364633492	618.186298	21.36774372

Company 5: HCL Technologies Ltd.

Company Overview

HCL Technologies Limited is an Indian MNC company which is headquartered in Noida, India. It mainly deals in IT services and consultancies. It is a subsidiary of HCL enterprise. It operates in 44 countries including UK, USA, and France with a worldwide network of R&D. It operates in many sectors like aerospace, defence, banking, capital markets etc.

Definition and Categorisation of Risk

HCL has defined that the Risk management policy as a component which provides foundations and organisational arrangement to design, implement, monitor, review and continually improve risk management throughout the organisation.

Approach to ERM

The approach to the ERM framework is made according to the SEBI's Listing Obligation and Disclosure Requirements Regulation. This helps the stakeholders get more confidence in the company's way of operating and also helps in managing the risks in a better way. It is based on COSO ERM framework developed in 2017 by the Treadway Commission.

Strategy and Objective setting

The strategy adopted by HCL is

1. Risk Identification
2. Risk Evaluation and Assessment
3. Risk Mitigation and Treatment
4. Risk Monitoring
5. Risk Reporting and Review

Key Risks:

i. Technology Adoption and Consumption Risk
ii. Political and Economic Risk
iii. Regulatory Compliance Risk
iv. Business Continuity Risk
v. Information and Cyber Security Risk
vi. Privacy Risk

vii. Forex Exchange Risk

viii. Acquisitions and Strategic Partnership Risk

ix. HR Related Risk

x. Tax Related Risk

Governance and Oversight

The governance is done by the apex authorities, the Chief Risk Officer looks over the whole risk management and reports it to the Board of Directors of the Company who overlooks the progress and define changes wherever necessary.

Technical Analysis

Table 9

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	3.56	58575	41366	1.416017986	17.27
2018	3.7	48023	36386	1.31982081	18.16
2017	3.78	45762	32949	1.388873714	18.8
2016	4.19	39340.6	27390.77	1.436272146	14.24
2015	5.35	35244.67	24224.39	1.454924974	20.76

Table 10

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	482.5	568.25	17.77202073	7.84679251	98.51015514	6.408131629
2018	442.63	481.28	8.731897973	7.84679251	0.783411682	6.408131629
2017	412.5	445.33	7.958787879	7.84679251	0.012542963	6.408131629
2016	424	413.7	-2.429245283	7.84679251	105.5969527	6.408131629
2015	399	427.73	7.200501253	7.84679251	0.417692388	6.408131629

IT Industry Conclusion

Table 11

Years	Average Price to Book Value of companies who implemented ERM framework positively(Infosys, Mindtree, Wipro)	Average Price to Book Value of companies who implemented ERM framework not effectively(Tech Mahindra, HCL Technologies)
2019	3.313333	3.48
2018	3.466667	3.345
2017	2.62	3.115
2016	3.193333	3.515
2015	3.613333	5.145

It is observed that the average price to book value of the companies who implemented ERM framework effectively have **lower** ratio compared to other companies in the Information Technology industry. This means that the companies which do not have strong risk management framework have better performance than the companies with good risk management framework in place.

Industry 2: Mining Industry

Company 1: JSW Steel

Company Overview

Jindal Vijayanagar Steel Ltd., popularly known as JSW steel founded in 1982 by Sajjan Jindal is an Indian steel making company which is headquartered in Mumbai India. It is one of the subsidiaries of the JSW group. It has grown to be second-largest private steel company in India, and recently it had a merger with ISPAT steel which further boosted their growth. The company has footprints over 140 countries and is one of the fastest-growing international company.

Definition and Characterization of Risk

The company's framework helps in identifying, evaluating, and mitigating business risks to protect its stakeholders' interest, achieve long term sustainable growth and also achieve its business objectives. The company has categorised its objectives for implementing risk management into 2 types, they are financial objective and Non-financial objectives.

Approach To ERM:

The company defines that as the organisation progress forward it has or may face many diverse and new age risks like digital effectiveness and cyber risks along with the conventional ones like regulatory risks etc. To effectively manage these risks and challenges JSW has followed the Internationally accepted COSO framework in its framework.

Strategy and objective setting

The risk mitigation strategy followed by the company is

1. Risk Identification and assessment
2. Risk ownership, impact assessment, proactive action and regular tracking
3. Training all its risk owners to view embedding risk intelligence
    a. Decision making
    b. Performance
4. Reporting to Directors' committee to oversee the risks
5. Independent review through a risk-based audit.

Key Risks

i. Market Fluctuations

ii. Financial Risks
iii. Regulatory Risks
iv. Operational Risks and
v. Social Risks

Governance and Oversight:

The company has appointed the departmental heads as the risk owners where they look after the department audit and see that the risks are identified. At next stage is then passed to Risk Management Committee which further discusses, finds the solution, and monitors the situation.

In the third stage, it then overlooked by Senior Management members who control the functions and monitors the situation. Their main job is to mitigate the risks and build a contingency plan. The final stage is the Board, where its main activity is to oversee the risk strategy and is responsible for the performance of the company and the risk management of the organisation.

Technical Analysis

Table 12

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	2.53	114914	35026	3.280819962	6.64
2018	3.11	92018	27998	3.286591899	6.75
2017	2.49	88089	22647	3.889654259	3.99
2016	2.03	82465.07	19612.76	4.204664208	-0.4
2015	1.23	85919.16	23054.08	3.726852687	2.09

Table 13

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	310	269.9	-12.92143894	24.86089909	1427.505067	31.90816324
2018	269	306.3	13.84758364	24.86089909	121.293117	31.90816324
2017	162.4	269.7	66.07142857	24.86089909	1698.307741	31.90816324
2016	102.3	162.5	58.7763878	24.86089909	1150.260375	31.90816324
2015	104.8	103.3	-1.469465649	24.86089909	693.288107	31.90816324

Company 2: Tata Steel

Company Overview

Tata Steel Limited, subsidiary of Tata Group was founded by JD Tata in 1907, is an Indian Multinational Steel Company formerly known as Tata Iron and Steel Company Limited (TISCO). They are headquartered in Kolkata; India and they are one of the top steel producing companies all over the world and are the second-largest steel company in India. Its operations are spread over 26 countries all over the globe. The company has even won an award for being the Best Risk Management Framework & Systems in the 4th India Risk Management Awards 2018 by CNBC TV18.

Definition and Categorisation of Risk

The company defines that the ERM framework allows it to undertake risks so that they stay competitive and to mitigate other risks to get sustainable results. Tata steel has adopted ERM formally in 2013 intending to become risk intelligent organisation which supports its decision making and prepare itself to handle unforeseen situations which are a probable threat to the progress of the organisation.

Approach to ERM

Tata Steel has developed the ERM framework by incorporating inputs from benchmark industry practices, international standards, and references like COSO and ISO 31000, leadership direction and continuous feedback from key stakeholders. It is been customised by the company to meet the organisation's requirements and been implemented all across its business units in India.

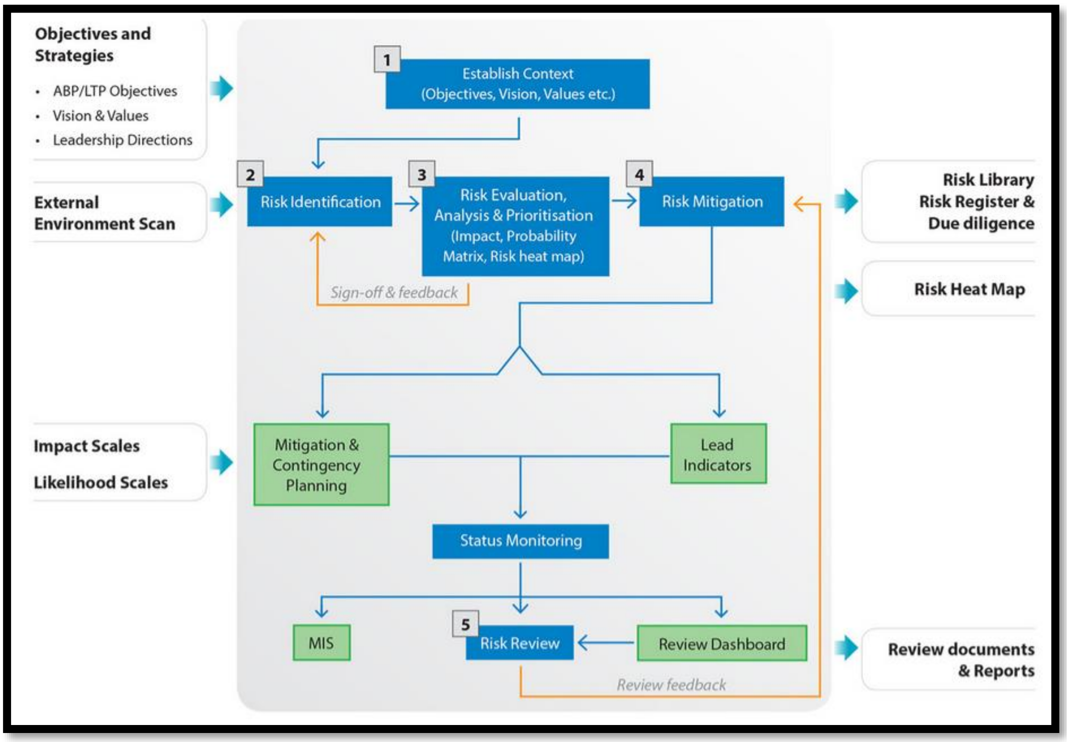
Strategy and Objective setting

The main objective of Tata steel to come up with a Risk Management Framework is to make the company Risk Intelligent by strengthening is risk resilience to significant risk exposures, providing agility and competitive edge over others to preserve as well as enhance long-term value for their stakeholders.

1. Establishing a context- where the objectives, vision and values of the company are defined.
2. Risk Identification

3. Risk Evaluation and Prioritisation- Here the probable impact, probability matrix and Risk heat map are made. Feedback is also sent back if any errors are there.
4. Risk Mitigation
   i. Mitigation and Contingency Planning
   ii. Lead Indications
5. Status Monitoring
   i. MIS
   ii. Review dashboard
6. Risk Review

Figure 7[8]



Key Risks

Tata steel has categorised key risk in 8 types.

1. Macroeconomic Risks
2. Regulatory Risks
3. Financial Risks
4. Operational Risks

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[8] https://www.tatasteel.com/investors/annual-report-2015-16/html/risks-and-opportunities.html

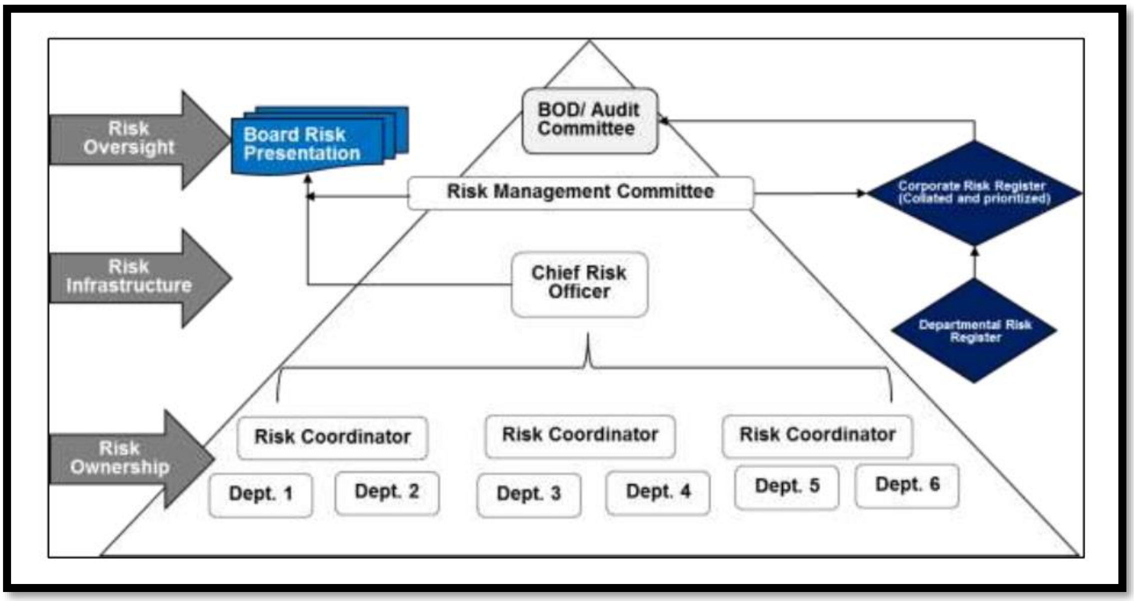
5. Market-Related Risks
6. Climate Change Risks
7. People Risks and
8. Strategic Risks

Based on these heads the risks are then classified and identified under which head it comes under and then mitigation strategies which are developed by them are used accordingly.

Governance and Oversight

The company has categorised the process under 3 stages, in the 1st stage for every 2 departments a risk coordinator is assigned. All the risk coordinators need to report their works to the Chief Risk Officer, who then reports to risk Management committee and then finally it is overseen by the Board of directors and the Audit Committee.

Figure 8[9]



[9] https://www.tatasteellp.com/wp-content/uploads/2019/08/Risk-Management-Policy.pdf

Quantitative Analysis

Table 14

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	0.89	233582.39	66650.08	3.504607796	4.37
2018	1.12	209757.94	58595.6	3.579755818	6.4
2017	1.32	173333.24	35544.31	4.876539733	-2.44
2016	0.75	177511.44	41457.55	4.281763877	-0.21
2015	0.98	158945.53	31349.41	5.070128274	-2.46

Table 15

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	522.1	472	-9.587204291	13.6596226	540.4149605	47.24657074
2018	697.9	521.9	-25.22031955	13.6596226	1511.649902	47.24657074
2017	371.7	697.8	87.71453166	13.6596226	5484.129556	47.24657074
2016	248.7	372.6	49.8491856	13.6596226	1309.68447	47.24657074
2015	377.3	247.3	-34.45808042	13.6596226	2315.313344	47.24657074

Company 3: Hindalco Industries Ltd.

Company Overview

Hindalco Industries Limited, earlier known as Hindustan Aluminium Corporation Limited was started in 1958, it is an Indian Multinational Manufacturing Company. It is a subsidiary of Aditya Birla Group and it manufactures Aluminium and Copper mainly. It is headquartered in Mumbai, India and is one of the biggest producers of Aluminium in the world.

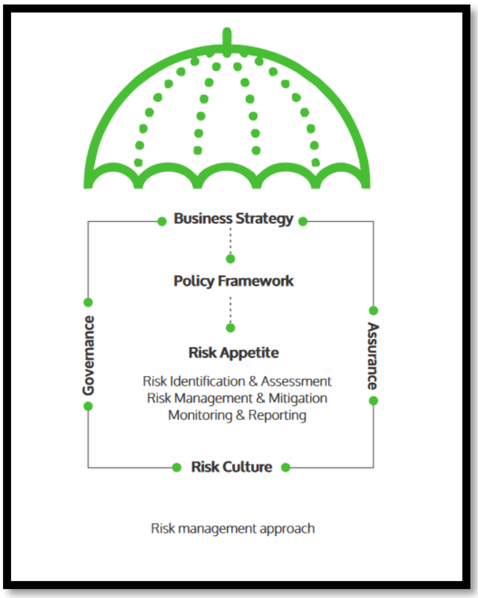
Definition and Categorisation of Risk

The company defines the ERM helps them to strengthen their commitment to being a responsible enterprise by adapting to a holistic approach to risk management. The framework also helps in tracking and managing any risks.

Approach to ERM

The risk management approach of the company is that, it has given risk culture, governance, assurance and business strategy as main components and the risk appetite and policy framework as the core components of the framework

Figure 9[10]



[10] http://www.hindalco.com/upload/pdf/sustainability-report-2018-19.pdf

Strategy and Objective setting

The approach of Hindalco to risk management has 3 steps,

1. Risk Identification and Assessment
2. Risk Management and Mitigation and
3. Monitoring and Reporting.

The risks are identified by the analysis of sector-specific, scenario of the industry, strategic lens and risk intelligence.

Key Risks

i. Operational and commercial Risks
ii. Strategic and technological risks
iii. Business model and sustainability related risks

Governance and Oversight

The governance is done by the apex authorities, the Chief Risk Officer looks over the whole risk management and reports it to the Board of Directors of the Company who overlooks the progress and define changes wherever necessary.

Quantitative Analysis

Table 16

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	0.79	152631.69	57497.84	2.654563893	3.6
2018	0.87	147827.27	54847.83	2.695225499	4.11
2017	0.94	146994.18	46055.02	3.191708092	1.29
2016	0.44	141986.56	40606.58	3.496639215	-0.17
2015	0.7	143138.87	38,328.54	3.734524456	0.59

Table 17

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	226.9	216.1	-4.759806082	18.08083992	521.6951098	51.89369705
2018	273.5	226.1	-17.3308958	18.08083992	1253.991026	51.89369705
2017	155.2	273.7	76.40992588	18.08083992	3402.282269	51.89369705
2016	85	155.1	82.41176471	18.08083992	4138.467884	51.89369705
2015	157.9	84.75	-46.32678911	18.08083992	4148.342677	51.89369705

Company 4: Vedanta Limited

Company Overview

Vedanta Limited is a mining company who mainly operate in zinc, lead, oil and gas, steel, gold, iron ore and Aluminium mining. The company is based in India, it was previously known as Sterlite Industries, and has started its operations from 1980. It was founded by D.P. Agarwal and is headquartered in Mumbai.

Definition and Categorisation of Risk

The company has designed the risk management framework to provide clarity on managing and reporting risks properly.

Approach to ERM

The company has customised the company the framework to meet the organisation's requirements and has implemented all across its business units in India.

Strategy and Objective setting

The strategy steps followed by the company are

1. Identifying the potential risks to the company

2. Evaluating these risks and formulating the mitigation strategy

3. Mitigating the risks

4. Monitoring the progress of the mitigation plan and also see how well the plan is.

Figure 10[11]

[11] https://www.vedantalimited.com/AR2019/opportunities-and-risks.html

Key Risks

The company has characterized risks into 4 types

1. Sustainable Risks

2. Operational Risks

3. Compliance Risks and

4. Financial Risks

Governance and Oversight

The company has appropriately allocated works to the respective departments. In the bottom, the risks must be identified by the respective business unit management teams, they further need to report to the Group Risk Management Committee and EXCO. They need to further report to the Audit Committee. They scrutinise more and check whether there are any lapses and implement the corrections required. The Audit company should report this to the Board of Directors. This is where all the objectives of the companies and framework are checked and where there are lapses and is governed totally by them

Quantitative Analysis

Table 18

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	1.1	202043	62299	3.243117867	3.49
2018	1.63	184798	63508	2.909838131	5.59
2017	1.69	199030	60500	3.289752066	3.49
2016	0.61	195231.1	44039.17	4.433123967	-6.28
2015	1.04	190282.42	53875.27	3.531906569	-8.22

Table 19

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	202.7	152.5	-24.76566354	13.51774448	1465.61933	71.94644841
2018	331	202.4	-38.86706949	13.51774448	2744.168734	71.94644841
2017	216	329.8	52.66203704	13.51774448	1532.27564	71.94644841
2016	91.55	216.3	136.2643364	13.51774448	15066.72583	71.94644841
2015	213.5	90.3	-57.70491803	13.51774448	5072.667656	71.94644841

Company 5: Coal India

Company Overview

Coal India Limited which was a private company at first, was undertaken by the government of India in 1971, it is headquartered in Kolkata, India. Its main operations are coal mining and refining. It contributes to almost 82.5% of coal production in India, accounting to almost 610.14 million tonnes of raw coal. It ranks 8th among the top 20 companies behind a third of all global carbon emissions.

Definition and Categorisation of Risk

The company defines that to improve the strategy making and decision-making process of the firm risk management framework is applied through which it can achieve its objectives.

1. While making the strategic decisions getting insights.

2. Aligning the objectives, performance, strategy and outcomes of the organisation.

3. Providing effective risk-managed governance and oversight on the performance of the company.

4. Providing more transparency for the stakeholders.

Approach to ERM

The company's enterprise risk management is based on the COSO framework and through it, the company wants to get more positive outcomes and reduce negative surprises, reduce performance variability, improving resource deployment and increase opportunity range. The company has formalized ERM and its mechanism such that it can sustain both Coal India and also its subsidiaries.

Key Risks

1. Credit Risk of receivables

2. risk by specific subsidiary companies with relation to redeemable preference shares

3. Evacuation challenges for coal off-take

4. Operational safety risks from mining operations

5. Technology up-gradation and equipment utilization

6. Impact of unviable underground operations

7. Competition Risk from Mining and Alternate energy sources

Strategy and Objective setting

The strategy implemented by the company is that,

1. Monitoring of risks, development of Risk Management Calendar to identify and monitor activities at different levels of management at the company and its subsidiaries

2. Identification of risks which are relevant for the company from the existing risk registers keeping in mind the changes in the business environment, policy changes etc.

3. Update key risks which are relevant to the Risk Management Committee and the Board of Directors.

4. For important risks, the risks Management team initiates workshops to finalize the mitigation plans.

Governance and Oversight

The risks are identified by the risk management committee and mitigation plans are formulated by the committee. Biannual meetings are held by the risk management committee where the board of directors, the CEO also participate and overlook all the progress and happening in the company.

Quantitative Analysis

Table 20

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	5.52	132718.83	26453.92	5.016981604	13.15
2018	8.87	127491.73	19846.57	6.423867197	5.5
2017	7.41	117815.22	24518.09	4.80523646	7.87
2016	5.29	112828.2	34833.16	3.239103199	12.64
2015	5.67	10,654.35	40,353.07	0.264028239	12.41

Table 21

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	241	211.4	-12.28215768	-11.6791528	0.363614869	2.094418749
2018	266	240.8	-9.475465313	-11.6791528	4.856238583	2.094418749
2017	303	263	-13.20132013	-11.6791528	2.316993357	2.094418749
2016	329.8	300	-9.03577926	-11.6791528	6.987423722	2.094418749
2015	384	328.7	-14.40104167	-11.6791528	7.40867895	2.094418749

Mining Industry Conclusion

Table 22

Years	Average Price to Book Value of companies who implemented ERM framework effectively (Coal India, Tata Steel, JSW Steel)	Average Price to Book Value of companies who implemented ERM framework not so effectively (Hindalco, Vedanta Limited)
2019	2.98	0.945
2018	4.366667	1.25
2017	3.74	1.315
2016	2.69	0.525
2015	2.626667	0.87

It is observed that the average price to book value of the companies who implemented ERM framework effectively have **greater** ratio compared to other companies in the mining industry. This means that the companies which have strong risk management framework are performing better than the companies with not so effective risk management framework in place.

Industry 3: Automotive Sector

Company 1: Ashok Leyland

Company Overview

Ashok Leyland is an Indian automobile firm which is owned by Hinduja Group, is headquartered in Chennai, India. It started its operations in 1948 and is the 2nd largest commercial vehicle manufacturer in India and the 4th largest manufacturer of buses in the world and 10th largest manufacturer of trucks globally. The company has been formed by merging Ashok Motors and Leyland Motors by Raghunandan Saran in 1954.

Definition and Categorisation of Risk

The company has implemented ERM to identify, measure, communicate and control risks within the company. It has characterised the risks as strategic risks, operational risks, financial risks, legal and compliance risks. This enables the business to identify and proactively address the risks and opportunities by assessing them in terms of likelihood and potential impact, determining the response strategy, monitoring them regularly.

Approach to ERM

The ERM framework embodies the principles of the COSO ERM framework and ISO 31000:2009 standard. This encourages a sound risk culture in the company and facilitates informed decision making. The risk management is overseen by the BOD through the RMC which is responsible to ensure the company has appropriate and effective ERM framework.

Strategy and Objective setting

The Risk management process was identifying the risks, assessing its impact on the organisation, formulating and implementation of risk mitigation plans and risk reporting to the higher authorities.

Key Risks

The key risks identified by the company are

1. Sustainable Risks

2. Operational Risks

3. Compliance Risks and

4. Financial Risks

Governance and Oversight

The risk management is governed by the BOD through the RMC which is responsible to ensure the company has appropriate and effective ERM framework. Also, an internal risk steering committee is there which comprises of key members of senior leaders and core business vertical heads who are responsible for the risk management process. The RMC reports to the board periodically regarding the effectiveness of the risk management framework, the risks faced by the company, the strategy formulated and implementation of mitigation plans.

Quantitative Analysis

Table 23

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	3.06	39121.91	8745.57	4.473340217	5.31
2018	5.73	33517.99	7420.59	4.516890166	5.25
2017	3.76	26668.32	6392.94	4.171526715	5.95
2016	5.87	22198.71	5263.7	4.217320516	3.07
2015	6	19,524.62	4,511.31	4.327926921	0.68

Table 24

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	102.4	81.5	-20.41015625	15.24971026	1271.626079	37.6979691
2018	120.5	102.6	-14.89626556	15.24971026	908.7798579	37.6979691
2017	80.4	119.3	48.32089552	15.24971026	1093.703295	37.6979691
2016	88	80.1	-8.977272727	15.24971026	586.9467045	37.6979691
2015	51.1	88	72.21135029	15.24971026	3244.628436	37.6979691

Company 2: Hero MotoCorp

Company Overview

Hero MotoCorp Ltd is an Indian motorcycle and scooter manufacturer which is headquartered in New Delhi, India. It was formerly known as Hero Honda, it is the world's largest two-wheeler manufacturer, and in India, it has captured almost 46% of market share. The company was founded by Pawan Munjal in 1984, it was a joint venture between Honda Japan and Hero Cycles and in 2010, Honda separated from the JV and Hero group bought the shares held by Honda and focussed on their respective subsidiaries.

Definition and Categorisation of Risk

The company defines ERM framework is important because the functions of the risk management and the strategic planning of the company are interconnected to each other. And for the company to achieve its business objectives are very risky and the ERM framework is the key input to the formulation and development of the strategy and business planning.

Approach to ERM

The company has an approved risk management policy and its objectives are identification and categorizing the risks, assessing, and mitigating them, monitoring and sustaining the market leadership.

Strategy and Objective setting

The strategy used by Hero MotoCorp is

1. Identification of the potential risks to the company

2. Analysis of the risks

3. Evaluation of the impact of the risks on the organisation

4. Treatment and formulating strategies to treat the risks.

5. Mitigation of risks

6. Monitoring of the risk management and the strategy implemented

Key Risks

The major risks identified by the company are

1. Competitive Landscape

2. Evolving customer preferences, driving structural industry shifts

3. Regulatory changes driving technology and cost implications

4. Macro Trends

5. Cybersecurity threats

6. A decline in the company's market share or failure to achieve growth.

Governance and Oversight

Each function of the risk management framework has a designated risk management officer who coordinated internal discussions to arrive at top risks for the respective function. The annual Risk refresher exercise ensures that the organization is focussed on the most relevant risk areas while identifying the risks the organisation is encouraged to explore. The RMC periodically oversees the risks and their mitigation plans, the committee provides its inputs on critical risks and shares its understanding of complex matters.

Quantitative Analysis

Table 25

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	3.89	18504.36	13120.41	1.410349219	18.61
2018	5.91	17396.73	11971.46	1.453183655	21.38
2017	6.24	15312	10315.51	1.484366745	23.4
2016	6.65	12895.81	8834.11	1.459774669	24.36
2015	8.07	10,654.35	6,540.00	1.629105505	22.19

Table 26

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	3097.5	2443.9	-21.10250202	-2.97900831	328.4610243	18.21329875
2018	3790.2	3105.7	-18.05865203	-2.97900831	227.3956549	18.21329875
2017	3045	3786.3	24.34482759	-2.97900831	746.5920078	18.21329875
2016	2695	3044.8	12.97773655	-2.97900831	254.6177064	18.21329875
2015	3100	2695.3	-13.05645161	-2.97900831	101.5548636	18.21329875

Company 3: Tata Motors

Company Overview

Tata Motors Limited is an Indian multinational automotive manufacturing company, it started its operations in 1945 as a locomotive manufacturer. The company is headquartered in Mumbai, India. It is a part of the Tata group. The company mainly deals with passenger cars, trucks, vans, coaches, buses, sports cars, construction equipment and military vehicles.

Definition and Categorisation of Risk

The company defines ERM framework is important because the functions of the risk management and the strategic planning of the company are interconnected to each other. The framework is used to achieve its objectives and mitigate any risks in its strategy to achieve them.

Approach to ERM

The approach to the ERM framework is made according to the SEBI's Listing Obligation and Disclosure Requirements Regulation. This helps the stakeholders get more confidence in the company's way of operating and also helps in managing the risks in a better way.

Strategy and Objective setting

1. RMC reviews the Tata Motors Risk governance structure, its assessment and policies, practices, and guidelines and also its risk management plan.

2. The Risk management framework is then reviewed and approved.

3. The company's risk appetite is calculated, and its strategy related risks are reviewed.

4. The risk mitigation plan is formulated and then implemented

5. The plan is then monitored, and the report is made in detail and presented to the Board in the meetings.

Key Risks

1. Rapid technology change

2. Evolving customer demands

3. Competitive business efficiency

4. Diesel uncertainty

5. Exchange rate fluctuations

6. Environmental regulations and compliances

7. Information and cybersecurity

8. Volatile global economic and geopolitical environment

9. Product liability, warranties and recalls

Governance and Oversight

The RMC reviews the company's risk governance structure, risk management policies, its assessment, its appetite, its practices and also its risk management plan. It reviews and approves the ERM framework. The board is responsible for the overall process of risk management in the organisation and the results of the risk assessment are thoroughly discussed with the senior management before it is presented to the Risk Management Committee.

Quantitative Analysis

Table 27

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	0.98	307194.53	60179.56	5.10463237	-9.38
2018	1.17	331350.51	95427.91	3.47225995	2.71
2017	2.73	273754.36	58061.89	4.714871665	2.72
2016	1.66	267141.15	78952.41	3.383571825	4.33
2015	3.15	2,38,657.99	56,261.92	4.241909803	5.86

Table 28

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	173.7	185.1	6.563039724	-12.5488666	365.2649639	27.29529854
2018	432.2	172.6	-60.06478482	-12.5488666	2257.762483	27.29529854
2017	474.95	431.2	-9.211495947	-12.5488666	11.13804297	27.29529854
2016	393.8	471.35	19.69273743	-12.5488666	1039.521031	27.29529854
2015	487.38	391.25	-19.72382946	-12.5488666	51.48009178	27.29529854

Company 4: Bajaj Auto

Company Overview

Bajaj Auto Limited is an Indian multinational 2- wheeler manufacturing company, which was established in 1945 by Jamnalal Bajaj and it was first started as M/s Bachraj Trading Corporation Private Limited. It is headquartered in Pune, India. The company deals in Motorcycles, scooters, and auto rickshaws. It is a subsidiary of Bajaj Group. It is the world's largest 3-wheeler manufacturer and 3rd largest motorcycles manufacturer and 2nd largest in India.

Definition and Categorisation of Risk

The company defines that to improve the strategy making and decision-making process of the firm risk management framework is applied through which it can achieve its objectives

Approach to ERM

The Risk Management framework of the company has been made with according to the provisions of the Companies Act, 2013 and listing agreement with the stock exchanges.

Strategy and Objective setting

1. Identifying the roles and giving the responsibilities of various stakeholders concerning risk management.

2. Identifying the industry's best practices which will robust the process of ensuring the business risks so that they are effectively addressed.

3. Creating an appropriate structure and strategy to address the inherent risks in the business effectively.

4. Internal Audit Function carries the risk focussed audits across all its business, enabling the identification of areas where the risk management processes need improvements. The Audit Committee reviews the findings and provides appropriate guidance on it.

5. Monitoring the internal control in the company and see that the recommendations by the Internal Audit are implemented effectively.

Key Risks

The key risks identified by the company are

1. Procuring Raw material

2. Manufacturing Risks

3. Climate changes and Environment degradation risks

4. Employee safety.

Governance and Oversight

The senior management, Board of the company reviews the risk management framework periodically to effectively address the emerging challenges in the competitive environment.

Quantitative Analysis

Table 29

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	3.63	28834.41	23233.81	1.241053878	17.08
2018	3.89	25141	20425.24	1.23087905	16.78
2017	4.55	21637.62	17856.57	1.211745593	18.85
2016	4.97	17240.3	14020.31	1.229666106	23.55
2015	5.26	15,965.60	11,095.32	1.438949034	18.95

Table 30

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	2738	3185.5	16.34404675	6.461382304	97.66705654	14.81376454
2018	3326.6	2718.5	-18.27992545	6.461382304	612.1323094	14.81376454
2017	2640	3323.2	25.87878788	6.461382304	377.0356392	14.81376454
2016	2530	2633.9	4.104743083	6.461382304	5.553748419	14.81376454
2015	2430	2533.5	4.259259259	6.461382304	4.849345905	14.81376454

Company 5: Motherson Sumi Systems Ltd.

Company Overview

Motherson Sumi Systems Ltd. part of Motherson Group is a Joint venture between Sumitomo Wiring Systems Ltd, Japan and Samvardhana Motherson International Ltd, India. It was established in 1986 and is headquartered in Noida, India. It mainly deals in Electrical Distribution systems and polymer processing. Its leading supplier of plastic modules and components in India and Europe and is top-ranked in auto ancillary in India for 7 consecutive years by Fortune India 500.

Definition and Categorisation of Risk

The company states that an effective risk management process is necessary for sustained operations and to achieve its strategic objectives. It also prepares the company to tackle the adverse situation in the business activities lifecycle and protects stakeholders' value by improving its governing processes.

Approach to ERM

The approach to the ERM framework is made according to the SEBI’s Listing Obligation and Disclosure Requirements Regulation. This helps the stakeholders get more confidence in the company’s way of operating and also helps in managing the risks in a better way.

Strategy and Objective setting

1. Identification of the risks
2. Evaluation of the impact due to the risks
3. Formulating strategies to treat the risks
4. Mitigating risks
5. Monitoring the process

Key Risks

i. Revenue risks
ii. Manufacturing capacity risks
iii. IPR infringement risks
iv. Social and economic risks

v. Product Quality and liability risks
vi. Process control risks
vii. Markets risks
viii. Geopolitical and geo- economical risks
ix. Patent and other risks and
x. Raw material price and supply risks

Governance and Oversight

The Risk Management committee does annual meet to discuss the policy and the measures taken at all management levels, opportunities, risks and optimisation measures in detail. Any exceptional situation which has potential risk associated will be identified and treated at an early stage to minimize their impact on financial and income position.

Quantitative Analysis

Table 31

Years	Price to Book Value	Total Assets	Net Worth	Leverage (Total assets/Net worth)	Return on assets(performance ratios)
2019	4.3	43330.2	10962.7	3.952511699	3.72
2018	6.64	37497.7	9884.1	3.79373944	4.25
2017	6.33	32369.7	8272.7	3.912833779	4.8
2016	8.03	19904	4397.1	4.526619818	6.49
2015	13.66	17570.8	3323.8	5.286358987	4.9

Table 32

Date	Open	Close	Actual Rate of Return(ARR)	Average Returns (AR)	(ARR-AR)^2	standard Deviation
2019	167.5	146.55	-12.50746269	6.823990016	373.7050636	36.95215937
2018	256.6	166.75	-35.01558846	6.823990016	1750.550327	36.95215937
2017	144.79	252.53	74.41121624	6.823990016	4568.033149	36.95215937
2016	130.23	144.79	11.18021961	6.823990016	18.97673628	36.95215937
2015	135.75	130.39	-3.948434622	6.823990016	116.0451326	36.95215937

Automotive Industry Conclusion

Table 33

Years	Average Price to Book Value of companies who implemented ERM framework effectively (Ashok Leyland, Tata Motors,)	Average Price to Book Value of companies who implemented ERM framework not so effectively (Hero Motors, Bajaj Auto, Motherson Sumi systems)
2019	2.02	3.94
2018	3.45	5.48
2017	3.245	5.706666667
2016	3.765	6.55
2015	4.575	8.996666667

It is observed that the average price to book value of the companies who implemented ERM framework effectively have **lower** ratio compared to other companies in the automotive industry. This means that the companies which do not have strong risk management framework have better performance than the companies with good risk management framework in place.

Individual Learnings

I have gained knowledge on what is Enterprise Risk Management, why it is mandatory by SEBI for companies to implement it. I have also learned about different frameworks developed by different standards, and how various companies are attending any uncertainties and mitigating any predictable and unpredictable risks which it might encounter throughout its business life cycle. I was also able to gain knowledge on 15 companies in 3 different and diverse industries like Metals and Mining industry, IT industry and Automotive Industry, by reading their annual reports. It also helped me to read these reports effectively and the manner in which these companies have implemented ERM framework in the organisation. I have also been able to go through research report works done by many top universities like IIM Calcutta on Enterprise Risk Management framework on Indian companies and also global which further refined my understanding pertaining to this subject, and further I was able to identify the parameters through which one can measure how the risk management framework is affecting the organisation's financials and operations. Using these parameters I have compared all the 15 companies data in the industries to know whether the companies who implemented the framework effectively are working better than those who did not give much importance to the risk management framework in its working.

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