

Analyzing Market Risk Estimates of a Conglomerate in Bangladesh: A Study on HNS Group

Internship Organization: HNS Group

Prepared by: Ahmed El Alam

ID: 211011011

Supervised by:

Ms. Arzoo Ismail

Senior Lecturer, School of Business

Submitted in Partial Fulfilment of the Requirements for the Degree Bachelor of Business Administration



December 10th, 2025

Internship Report Approval Form

Student Name: Ahmed El Alam

ID No. 211011011

Major: Finance

Year: 2025

Mobile Phone: 01781470629

Email: ahmed.alam.bba@ulab.edu.bd

INTERNSHIP INFORMATION

Internship

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Remarks (For Not Approved): _____

Name: Ms Arzoo Ismail

Date: 10/12/2025

Title: Senior Lecturer

E-mail: arzoo.ismail@ulab.edu.bd

Phone: 01621240000

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Name: Ahmed El Alam

Student ID: 211011011

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Date:

Letter of Transmittal

Dec, 2025

Arzoo Ismail

Senior Lecturer ULAB School of Business (USB) University of
Liberal Arts Bangladesh (ULAB) Satmasjid Road, Dhanmondi,
Dhaka-1209

Subject: Submission of Project report on “Analyzing Market Risk Estimates of a Conglomerate in Bangladesh: A Study on HNS Group”

Dear Ma’am,

Respectfully, I wish to inform you that my project, which is based on analyzing the market risk estimates of a conglomerate through Filtered Historical Simulation, has been completed. The Internship project report is designated as “Analyzing Market Risk Estimates of a Conglomerate in Bangladesh: A Study on HNS Group”, has been prepared and completed according to the requirements of the undergraduate program “Bachelor of Business Administration” (BBA) in the University of Liberal Arts of Bangladesh (ULAB). I have done my utmost best to collect and organize the information gathered from my education in my finance major and general courses, along with information from the internet, for researching and compiling the necessary information related to the research project. It is my sincerest hope that it meets with your approval and [patiently receive valuable feedback.

Sincerely, Ahmed El Alam

ID: 211011011

Bachelor of Business Administration (BBA)

Concentration: Finance

ULAB School of Business (USB)

University of Liberal Arts Bangladesh (ULAB)

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Part-A

Internship Journal

Chapter 1: Internship Preparation

1.1 Main motivation and gaining experience from the Internship

Finance is an important aspect of the national economy and market as it is considered to be the main base of an organization's structure, such as resource collection, capital allocation, and lastly managing risk estimates that any corporation would face from the volatile effects of the changing economy. Finance also plays a key role in job creation and stimulating economic growth. My main motivation for attaining an internship is for the purpose of gaining the necessary knowledge needed to adapt to a work environment more effectively, so that I can be better prepared for the actual job experience, as well as learning from the experience. I also desire to apply the knowledge I have learned from my university courses to any given tasks assigned to me by the internship advisor, who will be supervising me over the course of my 10-week internship, and lastly, along with learning from the experienced senior corporate staff who perform their duties.

1.2 Process in searching and applying for internships

During the searching period, I was looking which organizations related to my major that were offering internships, as well as searching through other ways, such as looking at websites like LinkedIn and BdJobs.com. I also asked for help for internship opportunities from my family and relatives who were in hob positions like human resources or financial management and similar corporate positions. The waiting period for an internship offer was very tense, as after my finals ended and after days of getting no responses like emails, text messages, or calls from the organizations I applied for,

I received a message from one of the organizations I had applied for, which stated I was not selected for the internship, and as a result, I was given a polite rejection. I also looked into other avenues of search, such as meeting with Mr Mahfuz of the Career Service office to discuss which institute was offering an internship and expediting the process. After weeks of waiting, a call from a member of the Human Resources Department from HNS Group, whom I had applied through a colleague's referral and stated that I to come to their main office at the Police Plaza Concord tower in Gulshan for an interview and talk about the internship in the conference room in their main office.

1.3 Experiencing Interviews for Internship

The interview process felt slightly tense as the interviewer was an assistant manager from the HR department. They asked personal questions, which were common ones, such as my name, which university, who referred, my home address, both present and permanent. I answered all the questions clearly and concisely as I could, afterwards when the discussions were over, the assistant manager then told me that they will call me later after some hours of deliberation with the other staff members, after some hours near evening, I received a call from the executive of the HR Department who said I have been selected as an intern and talked about the work hours and what obligations and responsibilities I will have as an intern, and lastly when I will my internship at HNS Group from 5th October. They also spoke about who will be my supervisor for the duration of my internship, that being Mr Bipul Kumar Saha, the General Manager of HNS Groups' Finance and Accounts Department.

1.4 Corporate background of the organization

Bangladesh's HNS Group originated in 1991 as a trading house and later moved on to other industries, such as importing automobiles (HNS Automobiles, n.d.) As a result, the organization became the foremost importer and distributor of Japanese and Korean cars in the 1990s (HNS Group, n.d.). HNS Group expanded further in 1992 from trading to being one of Bangladesh's main automobile importers and active sellers, which by the late 1990s became a market leader in retail passenger Cars, mostly due to its retailing network and services provided after-sales purchases (bdjobs.com, n.d). Their current corporate address is at Police Plaza Concord Tower, Tower-2, 7th Floor, Gulshan (HNS Automobiles, n.d).

During the leadership of its current chairman, Mr. Mohammad Shahidul Islam, HNS Group has since then utilized effective strategies, such as vertical consolidation, which HNS Group used to acquire multiple industries to control parts of the supply chain, such as production, sales, or even distribution 1990s (HNS Group, n.d.). Another corporate tactic they implemented was diversifying their portfolio, such as commercial vehicles, a variety of trucks & buses, and lastly, industrial equipment and vehicles (HNS Automobiles, n.d). In addition, they have the capability for spare parts production, applying financial support and service centers to retain customer bases, and demonstrating the adaptive capacity and resilience in their operations.

Furthermore, HNS Group had formed another company, HNS Heavy Industries Ltd which is invested in Bangladesh's local manufacturing capabilities and meeting the demand for locally produced and economical vehicles, and in partnerships with Hyundai Universe Elegant and Durjoy buses, assembled buses and their micro buses from parts outsourced from outside and then assembled with a locally produced frame to decrease vehicular costs and developing an assembly plant to advance the countries self-reliance in domestically assembled vehicles, and contributing to the nations GPD while reducing import costs as well as expanding their influence in the Transport industry (HNS Group, n.d).

Years later, HNS Group has steadily but consistently continued to extend forward to other industries and markets, such as Type Supplies from Hankook, Lubricants such as car, gear, or industrial oil from brands like SK and ZIC, as well as heavy industries, positioning itself as the sole provider and distributor in the automotive industries, and further developing the infrastructure of Bangladesh's Transport and Industrial sectors (bdjobs.com, n.d).

In the present time, HNS Group is now considered to be one of Bangladesh's well-established conglomerates in the automobile and heavy industries sectors, along with a market leadership role in segments of the industries, as well as vehicular assembly and distributing equipment (HNS Automobiles, n.d.). HNS Group also has a very diverse portfolio regarding revenue base, such as retail, and lastly, supporting Bangladesh's social and economic factors through investments in industries and service infrastructures (HNS Group , n.d.)

The main mission of HNS Group is to improve and further develop Bangladesh's socio-economic status through its various businesses and commercial activities while focusing greatly on satisfying its customer base, improving the quality of its products, and overall raising innovation (HNS Automobiles, n.d.)

HNS Groups vision is to become the most globally renowned organization in Bangladesh, using both human ingenuity and technological skills, assuming leadership in its specific markets, such as being the leading construction companies in Bangladesh, with another of its companies like HNS Heavy Industries visual goals in a vehicle assembly plant, raising customer bases and raising consumer trust through its services, with one of its objectives being capable of supplying high quality products at both domestically and worldwide at effective prices (HNS Group , n.d.)

Chapter 2: About The Internship

2.1 The Department and its daily activities

Regarding the office activities of HNS Group, the office has several cubicles assorted for members of the department such as the accounting and finance department sharing a large cubicle space with several others working together simultaneously along with other departments like the supply and logistics, marketing, and Human Resources as well as working with the general managers of each department with General Manager of the Accounts and Finance department being one of the managers that coordinated with the staff., the staff is constantly busy as they are dealing with multiple tasks and solving issues that occur. The Staff also has tasks that require going to the other affiliated groups, such as HNS Automobile, to confer with their corresponding department in similar matters, such as documents, bill payments, receipts, or order slips, etc. The finance department also goes to other banks to process payments and confirm transactions, as well as digital payments.

2.2 The Workplace Environment

The Work environment of HNS Group's main office is very busy as everyone is working and cooperating, as well as the office being completely open so that the staff and managers can interact and discuss their activities and work priorities, as well as having occasional small conversations, showcasing a unique synergy. The office is filled with cubicles which have a minimum space while allowing people to work in comfort with no restricting issues. Along with consistent meetings and conferences with the general managers of each department, as it is an open environment, everyone from other departments was interacting with each other frequently, leading to a positive work ethic and friendly conversations between the employees, executives, and managers.

There are also frequent meetings with departments or important corporate personnel, such as the chairman of HNS Group and representatives from other branches or organisations, which highlights the busy atmosphere of the workplace, and overall daily operations from Saturday to Thursday at 10 am to 6 pm.

2.3 Intern Responsibilities and Obligations

I had been assigned a cubicle next to the Deputy Manager of the Finance and Accounts, S.M. Khairul Hasan, who would act as an advisor for me on how the work would be and what tasks the sir would give to complete. Certain tasks were given, such as learning financial tools like Tally ERP, an important financial software that records transactions, orders, and keeps current accounts updated. I also assisted Khairul Sir in tasks such as joining his

bank-related work, such as cash deposits, cheques, receipts, along with normal tasks such as filing and sorting important financial documents, as well as assisting him with important files and envelopes that have bank statements in them. Furthermore, I have been assigned outdoor tasks to other financial institutions such as Albert Debit, Mutual Trust Bank, and Community Bank, as well as their subsidiaries such as HNS Automobiles. I have also been assigned to answer calls from calls in the office regarding Khairul Sir.

2.4 Utilizing education and skills in the internship

I have applied my education and knowledge, as well as other essential skills I have learned, to the questions asked by Khairul sir and answered them to the best of my abilities, while gaining relevant feedback. He also recommended books to cover certain gaps in my knowledge regarding finances. My familiarity with financial software such as SPSS Statistics and QuickBooks allowed me to easily understand how Tally ERP is operated with guidance and understanding from Khairul sir, and the process of inputting a journal entry in the software along with additional data to be implemented, as well as an internal history of companies listed which makes it easier to instantly select for the journal.

Moreover, I applied my practical skills that I learned from the courses and corporate-related co-curricular events in the workplace, with my major in finance, allowing me to understand the work being conducted in the finance and accounts department.

Chapter 3: Self-Reflection

3.1 Feedback on Internship

After completing my internship at HNS Group, I have gained a lot of firsthand experience in the corporate lifestyle and the work that is done on a daily basis. The assigned work and tasks that have been given to me have been enlightening and have helped broaden my idea of the workplace and what is expected of me as an intern.

Some of those tasks involved going outside to other financial institutions, such as banks, either near the workplace or in other locations in Gulshan-2. The work environment of HNS Group is very open, allowing quick interactions and work-related matters to be effectively conducted, along with practical tasks being and operations completed efficiently.

The staff and other members of the organization are very friendly and openly communicative (occasionally some cases and issues, led to a certain level of disagreements between individuals).

3.2 Self-Improvement goals and how I can be better utilized by the corporation

My goal to better improve myself to be up to the capable standards is to be actively more responsive in matters of the mental and physical aspects, along with reading more material related to the work and tasks, so that I can understand and be better prepared and efficient. I also need to be more vigilant in the workplace so that I can quickly respond to the issues or situations that may occur at any time.

Another part of self-improvement is constantly asking for advice and feedback from the supervisors on places where my knowledge and experience are lacking or slightly skilled, so that I can further keep advancing.

There are also potential circumstances where I might be asked to work with or interact with other departments or in different sectors, or may even require different skills that I may not have or have not learned, it is better to be prepared for any tasks or jobs that require certain skills and by learning from other sectors and branches can offer a diverse skill set and knowledge.

3.3 Recommendations for the Workplace

There are some recommendations I believe can be beneficial for HNS Group, such as:

- First recommendation to improve the workplace at HNS Group by providing greater learning opportunities which are broad and structured so that both new and old employees can learn more and gain effective feedback and regular meetings to improve their communications issues and reporting, especially for interns and new employees so that they can understand the instructions and tasks assigned to them more clearly and concisely, raising their expectations and capabilities to work effectively.
- Another consideration is enabling innovation in the workplace, where the employees can think more and work efficiently utilizing their creativity and out-of-box, which in turn improves idea generations, especially regarding to the corporate culture and working effectiveness. This improvement method will allow the office employees to make conceptual changes which can benefit them in the process and allowing quick adjustments.
- Lastly, the organization can potentially allow learning experiences and opportunities for improving the company's growth as well as raising the level of satisfaction for the staff, allowing better improvements for the working and collaborative culture of the organization. Mentors in the form of senior staff members are vital for developing the capabilities of new employees and teaching interns about the office assigned work so that it aids them effectively in the learning process as well as building up their level of understanding and confidence, making them more capable in taking the initiative and raising their competence. By providing access to special sessions or seminars, it teaches the junior employees how to be more reliable and effective in the organization in the long run.

Chapter 4: Personal Development Plan

4.1 Technical Skills

There are technical skills that I will need to improve, such as:

- Learning more about accounting and financial skills so that I can better improve myself, which will be necessary for the long term, making it important to understand the practical parts, such as accounting or financial statements, journal entries, etc., which are needed for critical thinking and organisational awareness. Moreover, tutorials can help with understanding the software and methods easily, developing my knowledge and fluency, as well as continuous learning.

Most importantly, feedback from the supervisor showed me where I lacked understanding and practice regarding certain parts of the tasks and how to correct the mistakes. Learning more about accounting software and programs for data visualization is needed for today's environment, where technology is used consistently. Lastly, I will learn more about accounts and financial principles from related courses, online financial news, and finally by watching how the senior staff in the Finance & Accounts department work.

- Another technical skill is understanding banking statements and learning other aspects related to banking, by paying close attention to the supervisor's work on bank statements, asking questions, interpreting them and understanding where terms are used like RTGS, meaning Real Time Gross Settlement or BEFTN, otherwise known as Bangladesh Electronic Fund Transfer Network, etc.

4.2 Interpersonal Skills

There is a list of Interpersonal skills that I wish to improve and develop during the internship at HNS group that is vital and necessary such as:

- An interpersonal skill I would like to improve is communication and understanding what is being discussed, along with learning to be effective to synergize well with other members of the organization. Only by learning to clearly and effectively communicate with others as well as understanding what they are telling in response will I be able to develop positively and, in turn, express ideas and conceptual planning, etc.
- Another interpersonal skill I feel needs to be developed is teamwork, as compared to university group teams or group assignments, understanding of how to effectively contribute is necessary to collaborate

productively. By being more prepared and alert, along with following through tasks, asking my supervisors, colleagues or fellow employees for clarification on certain points or tasks, and receiving necessary feedback to be effective at teamwork. Lastly, understanding others' diverse ideas and opinions to better work as there are possible conflicting differences and changing priorities.

- Lastly, I wish to improve more on my problem-solving skills because I need to be able to solve issues that may arise unexpectedly. Analytical thinking is critical for assessing and evaluating issues and understanding what solutions are suitable, as well as flexibility in adapting well to changes.

Part-B

Analyzing Market Risk Estimates of a Conglomerate in Bangladesh: A Study on HNS Group

Executive Summary

The purpose of the research study is to evaluate the level of risk estimates that an diversified conglomerate or organizations which have access to multiple business sectors or industries with a diversified portfolio such as multiple assets or different industries will face and improve its present risk levels through Filtered Historical Simulation, a financial tool used in estimating Value of Risk (VaR), which measures the expected loss they will face based on the given confidence level (99%-95%), as well as Conditional Value at Risk (CVaR) ((Murphy P. G.-P., 2015)), which measures the averaged expected loss that is above the risk threshold, which can greatly enhance the accuracy of the value of VaR and CvaR in providing the peak point of risk and possible loss beyond the level of risk. Afterwards, potential points of error can be identified, and improvements can be made to make estimating risk levels more accurate.

Furthermore, this research is being conducted to better develop and improve the existing financial risk management models and their capacities, as in the present era, the conditions and volatile nature of the current market are always changing, making the financial environment open to exposure from unexpected variations that can broaden the margin of error greatly (Paul Embrechts, 1999), affecting the risk estimates and potential losses.

As a result, many organizations may face unforeseen ramifications which can affect their diverse assets or their subsidiaries, and in turn make the existing or old risk management outdated, leading to greater vulnerability to extreme financial events or tail risk, which could result in severe losses as a whole.

By utilizing a more effective and efficient model for quantifying the risk estimates along with the insights from the survey being implemented, the research study will prepare a very extensive evaluation of the current risk management processes being implemented and what models for estimating the level of risk, their confidence levels, measuring the fluctuating tail risks, along with identifying the unseen or missing portions in their methodologies, and what components can be assessed and improved such as better sampling methods, modes, and techniques, improved financial dependency structures.

Chapter 1: Research Introduction

1.1 Main Objective of the Research

There are objectives of the research:

- Evaluating and assessing how corporations estimate and measure the market risk and what type of risk management method is being primarily used in their analysis.
- Develop an understanding of the comprehensive evaluation of risk models that use Filtered Historical Simulation (FHS) for calculating Value-at-Risk (VaR) and Conditional Value-at-Risk (CVaR) . The core point is that merely using these models is insufficient; their outputs must be thoroughly verified through other evaluation processes to ensure their reliability and effectiveness across various market conditions - and in doing so I would specifically like to:
 - a. Verifying the Reliability of Risk Estimates
 - b. Adequately Stating Tail Risk,
 - c. Determining Effectiveness in Fluctuating Markets

The second part of the research is understanding what areas can be further improved or enhanced for the risk management model (FHS), along with identifying the missing or outdated information regarding the sampling, model.

1.2 Problem Statement of the Research

As it has been shown that diversified conglomerates faced unique and unpredictable challenges and issues in estimating the level of market risk and utilizing risk management models, they use to mitigate the risk exposure to a minimum or at least reduce its causative effects. The common risk management methods, such as historical simulation or even Value at Risk models, have faced volatile market conditions and sudden shocks (Murphy G.-P. &., 2015) in their modelling due to changes, not being able to account for the fluctuating nature of the market conditions, the changes in the correlations used for sampling, or even the tail risk events (Paul Embrechts, 1999) that have led to a severe negative outcome. This is now a common feature of the nature of the modern market structure. The present risk estimate models use unofficial market data or raw market data as well as fiscal speculation during periods where the market condition is stable or close to a constant state, as this specific thought process can lead to an overestimation of the variability, leading to inaccurate data and variability changes, which can as a result to expose the asset classes and subsidiaries to exposures to extreme market conditions and higher losses than the expected threshold.

1.3 Research Background & Literature Review

The concept of risk management and its main purpose has been a leading and central figure in finance, especially the risk estimates regarding the unexpected and extreme conditions and volatile nature of the financial market state, along with complicated financial modelling tools. Financial corporations, companies connected to diverse sectors, and financial specialists and experts utilise effective risk management tools in estimating losses and setting stability measures crucial to mitigate the severe changes.

Before FHS, Value at Risk or VaR, was theorised and made practical during the 90s, it was standardised as a financial tool which could measure the market risk, along with quantifying the potential losses that could be calculated at a given confidence level. However, even though it is used worldwide, corporations have not been able to predict the tail risk or rely on other distributional methods instead of theoretical speculations. Another financial tool, Conditional Value at Risk or CVaR for short, is an alternative solution that can actually measure the losses faced by VaR estimated beyond the set limit.

Later on, Historical Simulation, another financial tool derived from VaR and CvaR, is used greatly by risk management analysts due to not using parametric data, but underestimates the level of risk during critical periods in the market conditions, whereas Filtered Historical Simulation (FHS), on the other hand, can actually address those restrictions by resampling previous historical data and merging it with volatility models, which can reduce the repetitive testing necessary for turbulent market conditions and fluctuating changes. And adding extreme value theory, another component which increases the accuracy of CvaR to include modelling the high level of loss estimated in historical data, to FHS raises the capabilities in identifying and taking in market impacts, especially for organizations with multiple asset classes.

Furthermore, FHS has certain disadvantages, like limited data, or the validity of useful models instead of traditional financial models, along with statements made by the Basel Committee, which quote that FHS and CVaR are being utilized more by organizations for risk assessment and management.

1.4 Market Risk Estimates

Every organization faces the main issue of Market Risk, where it is considered to be a speculative estimate for financial loss on a portfolio or investments due to fluctuating changes and adverse volatility in the market prices and rates. The estimates for potential loss from varying market risk are calculated based on a specific time period and expected level of confidence, quantifying the result for assessment from risk management.

The most reliable method of calculating and evaluating market risk estimates is Value at Risk, which calculates the estimated loss of the portfolio into numerical results based on the confidence level and horizon level.

Key Aspects of VaR:

- Horizon level for time: The time period where the potential loss is calculated like for example, a single day or a week.
- Confidence level: The level of probability that the loss will not exceed the estimated Value at Risk (VaR), with the confidence level being set from 95% to 99%.
- Amount of Loss: The maximum amount of loss that the company's portfolio can face within the estimated time frame and confidence level.

Conditional Value at Risk (CVaR) is another risk estimate that evaluates the expected loss of a portfolio, more than Value at Risk (VaR). It is also known by another name, called the estimated shortfall, which shows that the potential loss is greater than the potential loss from VaR.

CvaR focuses on the tail or end of the distributed loss as well as reaching the maximum loss expected beyond the normal VaR, providing a more complete image of the expected losses and is used in portfolio optimization.

Filtered Historical Simulation is another method for estimating the level of market risk that further changes the historical simulation, where instead of the historical data being given equal weight, it instead adjusts the returns with the ratio of the current volatility and historical or previous volatility through forecasts on that specific day.

(Filtered Historical Simulation is another method of Value at Risk that is used to estimate possible prices of assets through merging historical data with a statistical model to record the volatility patterns of the market and format the past returns to current standards, which are then randomly sampled to form possible theoretical scenarios for fluctuating changes in the market.

A model like the Exponential Weighted Moving Average model or EWMA can be used to calculate the volatility by emphasizing more on the past returns for better estimation.

$$E.W.A.M(t) = \{\alpha * x(t)\} + (1 - \alpha) * E.W.M.A(t - 1)$$

The historical or past returns are then divided by the matching historical volatility, resulting in filtered returns.

The results are then multiplied by the same volatility estimate.

Lastly, the new returns are then used to create scenarios that are adjusted to the present volatility estimate.

The value at risk is calculated from the new data to provide a more updated risk estimate.)

Important factors for FHS are that it is more responsive to market data based on current fluctuating forecasts. It can easily adapt to changes in market models with frequent changes during volatile and less volatile periods.

Most of all, it allows for a better level of risk management as it is consistent and up-to-date, along with improved sensitivity to market activities.

1.5 Contribution to Research

In regard to contributing to research, it is believed that the research can lead to numerous organizations in Bangladesh to implement strategies that can effectively enhance and strengthen the risk management process and update to the current standards used worldwide.

Older Risk management Models, such as Historical Simulation, for example, are not effective in recording tail risk that unexpectedly appears in the financial market. On the other hand, FHS can detect the current market conditions efficiently and also determine the risk estimates well, and reduce the amount of testing for losses which are above the threshold of VaR.

FHS can also be utilized in the decision-making and strategic planning process, based on which industries or sectors in calculating the losses expected by the private and public corporations, and forming measures against varying market changes.

Chapter 2: Research Methodology

2.1 Type of Research conducted

The method I have used for this research project is Purposive Sampling, a sampling method that focuses on mostly on individuals who are connected the research of financial risk analysis such as members of the risk management section or managers and employees of the finance department, who analyze the current market risks and changing conditions as well as sampling the sampling data to create an estimate for potential losses as well as planning measures to mitigate it to below the potential loss threshold, this sampling also would provide the important data, especially observations and insights necessary for the research. Moreover, the survey would also include more crucial information, such as the decision-making process for quantitative data and multiple portfolio analyses. Lastly, the responses gained from the questionnaire will determine the effectiveness of implementing FHS in evaluating the risk levels.

2.2 Dependent and Independent Variables for the Research

The Dependent Variable is how many times VaR and CvaR is used in the strategic planning between the management in the organization and strategies. This dependent variable is very important as it determines the risk management models used, along with their necessity in the process of capital allocation, financial budgeting, and estimating the limits and thresholds. Another factor is that VaR & CVaR are used differently in several ways by different organizations, and depending on their level and scale of operation, the type of industries. CVaR is consistently used more than VaR due to the tail risk sensitivity, but factoring in restrictions that can limit its use is also considered, determining whether they are used effectively as financial tools or capable of contributing to the planning and decision-making process.

The Independent Variable is the type of risk management model being used by organizations to determine the risk estimates and if the methods being used are accurate and reliable in terms of predicting potential losses, with models like HS, Parametric VaR, and the Monte Carlo method having seen used, where Historical Simulation for example, is the most simple risk management model used and utilizes data from past and current years but not adjustable to changes, whereas Monte Carlo Simulation has effective flexibility but it requires significant algorithmic resources necessary for scenario generation (Brandimarte, 2014). The models used can subtly enhance the tail risk estimates, testing repetitions, and lastly, the effects from conditional differences and a set confidence level. This can further evaluate whether the Filtered Historical Simulation is an attempt to mitigate the risk estimates.

The research method being implemented for analyzing market risk estimates is called the Filtered Historical Simulation, or FHS for short, a type of financial statistical tool, to evaluate and decrease the level of risk through volatility filtering, which refines the time fluctuations in the market, and empirical shock resampling, which repeats the sampling process with multiple samples with different results.

2.3 Filtered Historical Simulation

The Research is carried out by calculating the daily price and returns from the company's portfolio data, involving the risk factors like equities, bonds, commodities, etc. The data is then adjusted for strategic corporate actions, and using volatility filter models such as the GARCH or EWMA (Exponentially Weighted Moving Average) model to calculate the factors for volatile forecasts, and standardized residuals to establish a collection of economic shocks, which are events that affect the market, such as changes in monetary policies.

The repeat samples are then used for the forecast with the conditional volatility, which is implemented into scenarios or simulations that keep the empirical shock samples while adjusting for the risk factors related to time volatility. The model then adjusts the sample data through present volatile forecasts, and afterwards converts the results of the model factors into portfolio profit and loss. VaR and CvaR are then simulated from the profit & loss of the portfolio using confidence levels of 95% to 99%, and a selected horizon level. Precision is improved by using a model called the EVT model for the larger events.

The output is confirmed with rigorous testing, checking for changes outside the given data, analyzing filters, resampling the size of the model, and the peak point for tail accuracy or precision. Furthermore, additional parts are added to Value at Risk and Condition Value at Risk to calculate the assets or units that are near systematic tail risk.

The FHS model is used in conjunction to the Historical simulation model by applying volatility models such as GARCH, which adjusts past price returns to fluctuating market conditions, making it more effective in risk estimations, especially during high volatility. Filtered Historical Simulation is widely used among banks and financial institutions for portfolios and emerging financial markets. Furthermore, it decreases the number of back testing's needed, and accurately measures tail risk compared to previous methods.

2.4 Volatility filter models for FHS based on their effectiveness

The volatility filter models are necessary for FHS because, instead of using past historical returns consistently, they can normalise past portfolio returns using standardised residuals, turning them into identically and independently distributed (i.i.d.) innovations. The I.I.D. variables are then scaled back through the present volatility forecasting models, which can then be implemented to create Profit-Loss simulations, representing the

current condition of the market. There are standard models like GARCH or EWMA that provide fast, simple baselines, whereas other models like EGARCH can capture market risk more accurately, accounting for changes in financial policies that can affect the level of risk in the market state.

2.4.1 GARCH

The GARCH Filter model is a validated filtering model which is easier to utilize due to its clustering along being more effective in Filtered Historical and Simulation, as well as providing precise forecasts and adjusting well to fluctuating volatility (Bollerslev, 1986), but it can, however, handle high levels of volatile data, which can affect the GARCH model, destabilizing it due to its data sensitivity.

- **Formula for GARCH:**

$$\sigma_t^2 = \omega + \alpha r_{t-1}^2 + \beta \sigma_{t-1}^2$$

$[\sigma_t^2 = \text{Conditional time variance}]$

$[r_{t-1}^2 = \text{Return at time}]$

$[\omega = \text{weight constant for positive variance}]$

$[\alpha = \text{squared returns weight}]$

$[\beta = \text{variance weight}]$

- **Standardized financial shocks:**

$$Z_t = \frac{r_t}{\sigma_t}$$

$Z_t = \text{Standardized shocks in relation to I.I.D}$

- **Scaling the standardized shocks by the current volatility condition:**

$$r^{(n)} = a_T \times z_{i_n} [\text{Tested Standardized Shock}]$$

$$r^{(n)} = \omega^n r_T^{(n)}$$

$$r_T^{(n)} = D_T^{z_{i_n}}$$

- **Portfolio Value Losses:**

$$\ell^{(n)} = -v_0 \times r^{(n)}$$

2.4.2 Value at Risk (VaR) & Conditional Value at Risk (CVaR):

$$VaR_{\alpha} = -F^{-1}(\alpha) \text{ [Value-at-Risk]}$$

VaR = Value at Risk

$-F^{-1}$ = It is a statistical measure, defined as the inverse of an increasing distribution function, that calculates the portfolio's loss density, the negative minus represents as the portfolio losses.

α = It is the level of Confidence (from 95% to 99%).

$$CVaR_{\alpha} = -E(L | L \geq VaR_{\alpha})$$

L = Loss of Portfolio

$-E = (L | L \geq VaR_{\alpha})$ = The expected losses calculated are above the Value at Risk

2.4.3 EWMA

The filter model of Exponentially Weighted Moving Average (EWMA) is faster to adjust to volatile changes in the market conditions and fluctuating price changes, and can adapt to changes efficiently along but it can be exposed to false or misleading market price changes, which can lead to weak or poor results while requiring significant model parameter adjustments, still being dependent on past historical data.

Formulas for EWMA:

$$\sigma_t^2 = \lambda \sigma_{t-1}^2 + (1 - \lambda) r_{t-1}^2$$

$$\sigma_0^2 = \text{Variance}(r)$$

- **Standardized financial shocks:**

$$z_t = \frac{r_t}{\sigma_t}, \quad z_t = D_t^{-1} r_t$$

- **Constant Covariance Changes**

$$\Sigma_t = \lambda \Sigma_{t-1} + (1 - \lambda) r_{t-1} r_{t-1}^T$$

2.5 Confidence levels for FHS

The confidence levels for risk management are typically set at 95% to 99%, (Basel Committee on Banking Supervision, 2019) especially for evaluating and assessing the risk estimates gained from FHS. The VaR &

CVaR calculations can be influenced based on the confidence levels that have been used, which can impact the results regarding the potential losses being evaluated.

At 95%, this level of confidence is suited to efficiently and being sensitive to changes in the data as well as monitoring the differences, whereas a level of confidence set at 99%, is more effectively the most preferred level due to meeting the regulations for risk management and assessing severe tail risk events and fluctuations. Choosing the right level of confidence is crucial for implementing FHS, especially in the process of choosing the suitable volatility filter models in simulating various tail risk estimates for each scenario, and adding to that, both confidence levels are effective strategic management methods which can greatly assist in risk management and analysis.

2.6 Key parts of the research design for FHS

FHS or Filtered Historical Simulation is a considerably practical method to reliably estimate' risk estimates of Value at Risk, and Conditional Value at Risk by not including changes in volatility from the returns on investments and using the clean historical or empirical shocks, and lastly modifying the risk level to the present standards to produce loss scenarios.

The research design is mostly a combination of multiple factors, like that of a mixed study method, where the survey implements quantitative or statistical modelling with a few qualitative aspects to evaluate and analyse the VaR and CVaR, regarding the FHS model in Bangladesh's conglomerates. Parts of the quantitative analysis based on FHS are being applied towards historical data; the portfolio returns are being filtered through either the GARCH or EWMA volatility filter models to form the standardized financial shocks, resampled to simulate risk estimates, depending on the output from different levels of confidence (95-99%) and changes in the market state. The responses from the survey in conjunction with the insights provided by the individuals in risk assessment roles, along with their current methodologies, practices, and adapting to current or future challenges regarding the market conditions, and addressing whatever gaps or issues that are prevalent in financial organizations in Bangladesh.

Key Data for modelling FHS:

- Weekly Daily Price Returns (Base & Calculated) from the company's portfolio (Bonds, Equities, Foreign Exchange, etc.)
[Based on the number of years necessary for FHS.]
- Daily market values and the organizations netting and hedging data.
- Portfolio Profits and Losses for repeat testing.
- Portfolio Maturities and Liquidity (Bids, spreads, etc.).

Chapter 3: Literature Review

3.1 Risk Management History

The history of risk management and analyses regarding Value at Risk during the early phases was used as a standardized financial tool for measuring market risk estimates, due to its simplicity and user-friendliness, and was subsequently accepted as a regular measure under the Basel Framework, a set of banking standards applied worldwide. But there were issues during its usage, such as capturing tail risk, as a result, Conditional Value at Risk or alternatively called Expected Shortfall, mitigated these issues as it could measure the expected losses that went beyond the limit of VaR.

Historical Simulation also faces similar issues on the idea that volatility will remain constant as well as market conditions being constant. As a result, Filtered Historical Simulation was implemented because it can be combined with volatility filter models such as Garch, Ewma, used with historical resampling, making it effective and adjustable regarding returns from current volatile conditions and reducing the back testing number, producing accurate risk estimates.

3.2 FHS Usage

The use of FHS in present organizations has become widespread and fundamental, especially due to the fact that it is considered to be the link between the common historical methods and the advanced parametric modelling. FHS can adapt efficiently to previous yearly returns by incorporating conditional volatility models like GARCH, assessing the status of the market conditions and its volatile nature, along with tail risk distributions.

FHS has become a valuable statistical tool for most financial institutions and organizations, due to using data as well as adaptability, it can be applied to past historical data and adjustable from the fluctuating volatility which in turn improves the accuracy of the results for risk estimation. It also reduces the number of backtests needed, evaluating the tail risk estimates and lastly improving areas in the financial strategic process like allocating funding and resource distributions, safeguarding against potential losses exceeding the limits of VaR etc. Furthermore, its capabilities of adapting to severe fluctuating changes in volatility, differing from other more traditional models, making it a highly productive tool in risk management.

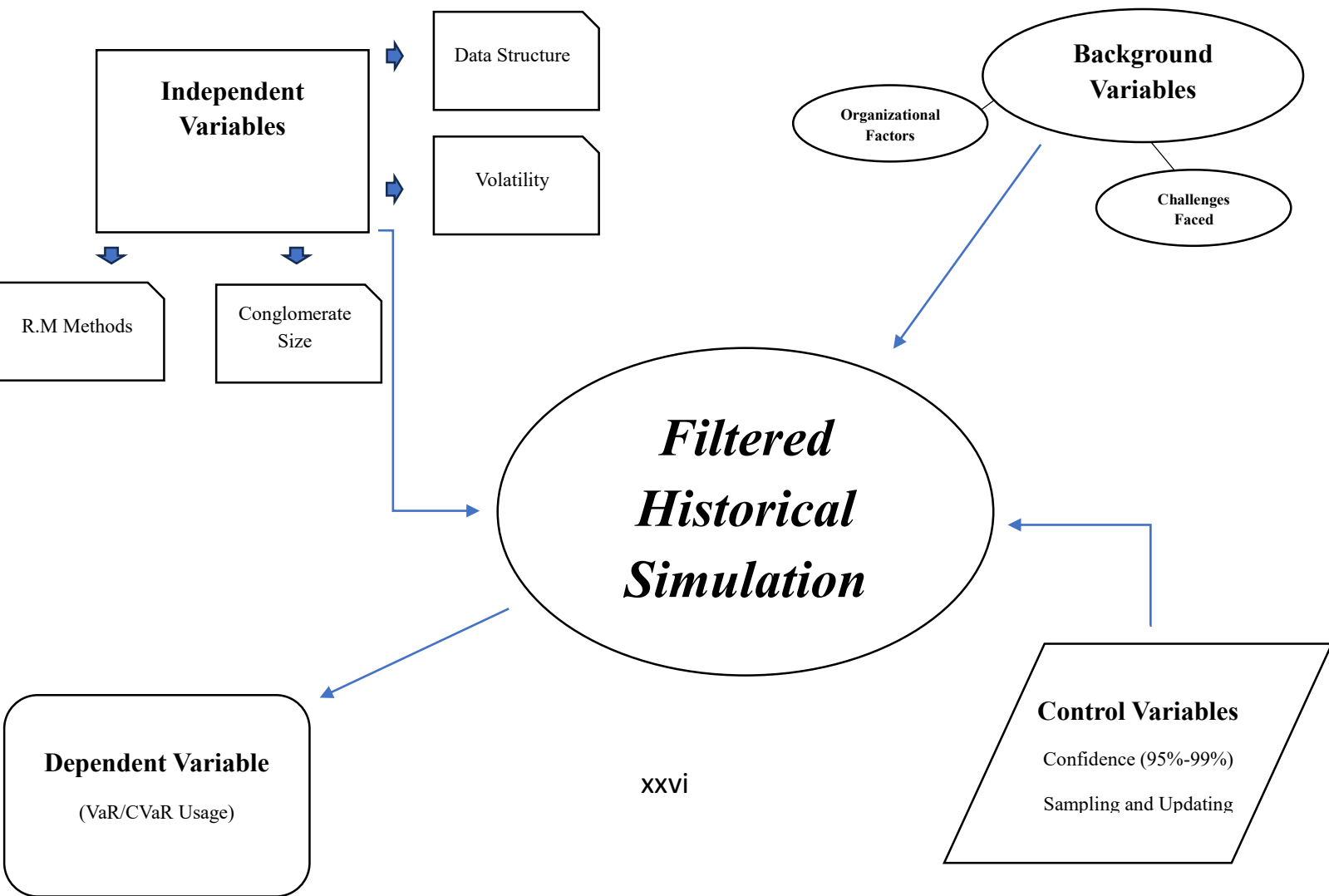
3.3 Conceptual Framework for analysis and variables adopted

The conceptual framework is based on analyzing the market risk estimates, where the usage of Value at Risk (VaR) and Conditional Value at Risk (CVaR) is designated as the main dependent variable, which shows the level of degree that the organizations will use these two statistical calculation measures, especially towards the decision-making process such as capital allocation and funding, hedging necessary data, as well as financial

budgeting and limitations. The independent variable, in this circumstance, is the risk management methods and assessment models utilised currently by the risk management teams, consisting of multiple risk measures such as HS, Monte-Carlo, Parametric VaR, FHS, etc. The risk methods chosen can affect and influence the reliability of the VaR and CVaR values, with some, like the traditional methods, like Historical Simulation, being mostly due to organizational regulations and have not faced issues during its usage whereas other risk management methods such as Monte-Carlo including VaR CVaR more into their process, affect, the results from the decision-making process and strategic planning. Furthermore, there are other parts of the survey, such as the confidence levels, updating their model frequently, the number of sampling methods and techniques, and the characteristics of the respondents representing their organisation, like their roles, scale or size, and lastly what industries they are involved in regarding risk management. There are also other factors which can affect their current models, such as gaps or constraints on data, complicated data processing, etc. As a result, this conceptual framework can be seen as a potential measure that can be adopted to improve the risk management process and effectiveness in estimating market risk.

Conceptual Framework

Risk Management Models & VaR/CVaR Usage



Chapter 4: Collection and analysis of data from Sampling and Research

4.1 Survey Response regarding FHS

The data collected from the survey has shown that many organizations in Bangladesh, along with different business firms such as Banks, Marketing, and Information technology, as well as other financial institutions, have been designated to use Historical Simulation (HS) and Parametric Value at Risk (VaR) as their main method and model of risk assessment and management, with few users of the Filtered Historical Simulation (FHS), or the Monte-Carlo Method of risk management.

Significantly, the confidence levels used by these organizations, according to the data gathered, are consistently set at 95%, with fewer responses from larger businesses being fixed at 99%. A single issue is that most companies have chosen not to update their current risk management models or do it infrequently at times, as a few have dedicated themselves to improving their methods and frequently updating.

Even though Value at Risk (VaR) and conditional Value at Risk (CVaR) are still used in many firms, the capabilities of these statistical calculation methods are restrained due to the limitations imposed on financial and historical data, as well as facing problems regarding estimation. FHS's efficiency and effectiveness are different in many firms, especially regarding the methodology as well as variable techniques for risk assessment, accentuating a delay or gap in FHS being adopted or implemented, along with difficulties in using advanced risk management models.

The data collected from the survey is entirely ethical, as the 20 respondents from both the internship organisation and other companies fully understand that the data will not be misused illegally or in any other illicit activities, and they have granted full permission to record their answers necessary for the research.

4.2 Purposive Sampling Responses from Survey

Risk Method Frequently used			
HS	Parametric	Monte-Carlo	FHS
45% (9)	40% (8)	5% (1)	10% (2)

From the data collected and based on the response, 45% of the feedback given by the respondents shows that Historical Simulation is the main risk management model being currently utilized greatly in many organizations, along with the traditional risk method being preferred more, with the other half being 40%

preferring the parametric risk models, and 1 or 2 individuals stated either Monte-carlo simulation method or Filtered Historical Simulation.

4.3 Chosen Confidence level

Level of Confidence	
95% Confidence	99% Confidence
85% (17)	15% (3)

Regarding the Confidence levels used for risk management models, mostly towards analysing the data from the results, preparing risk mitigation measures, most responses were 85% where the risk management uses 95% as their set confidence level. This specific confidence level is used mainly for risk management strategies with minimal risk levels affecting or influencing the planning process. 15% means that only large organisations that have a high level of trust regarding the risk management model they have chosen and the level of confidence chosen, which is 99%, and measuring the tail risk events, or the turbulent nature of the market condition, meet the appropriate preparation regarding high-risk environments and accuracy.

4.4 Regularity of model update

Update Model Frequency			
Daily	Monthly	Frequently	Quarterly
0%	25% (5)	30% (6)	45% (9)

When the risk management models are updated frequently, the responses have shown that 45% have updated their model at quarterly times, and 25% update their model every month, whereas 30% frequently update their models, meaning that this disruption has a high disparity, pointing towards a reactionary element towards changing market conditions and adapting to fluctuating volatility instead of frequent updates. As a result, this shows that vulnerabilities and possible weaknesses towards corresponding risk, not being able to adapt to sudden changes in the state of the market

4.5 Problems faced by financial statistic measures

VaR & CVaR Issues				
Data Restrictions	Complex Computation	Estimating Tail-Risk	Model Validity	Regulations & Policies
30% (6)	30% (6)	20% (4)	10% (2)	10% (2)

Lastly, the organizations use VaR and CVaR more or less face difficulties in utilising the statistical measures in risk management. The most frequent issues faced by VaR and CVaR are restrictions on data or limitations, explaining the reason for about 30% of the issues faced, and the other 30% were data computing issues, 20% were about complying with the fixed regulations, and lastly, 10% were about tail risk estimates and model validity. The outcome shows that many barriers are hindering the effectiveness of Value at Risk and Conditional Value at Risk in the organization.

4.6. FHS Effectiveness in current market conditions

Historical Simulation Estimates			
H.E	S.E	SL.E	I.E
45% (9)	35% (7)	15% (3)	5% (1)

The last part of the survey responses regarding the effectiveness of FHS in current market conditions and fluctuating volatility has shown varied findings, such as 45% stated that FHS was effective, but 35% said it was somewhat beneficial, and lastly 15% and 1% responded that FHS was slightly to ineffective.

4.7. Overall Findings about the research

The findings based on the responses from the survey have highlighted a varying list of risk management methods that are implemented in some organizations and financial institutions in Bangladesh.

- It has been reported that the more reliable and common risk management methods and models are frequently used, along with some companies selecting and adopting new advanced methods, such as Filtered Historical Simulation or the Monte-Carlo Simulation.
- There have been multiple business organizations which selected a 95% Confidence level, whereas some conglomerates have adopted a 99% level of confidence while frequently updating their risk management models with daily data to match the current market condition, along with the appropriate volatility filters regarding the fluctuating state.
- The state of Bangladesh's economy and its current conditions, such as high inflation and declining stocks, have affected the risk management methods and risk models. (Jago News 24, 2025), (The Voice, 2025)
- There are some key issues related to Value at Risk and Conditional Value at Risk regarding their different uses and restrictive conditions.
- A limited number of organisations have used FHS as it was an extension of the statistical measure of Value at Risk.

Chapter 5: Recommendations and Conclusion

5.1 Recommendations to improve FHS implementation

Taking into consideration of the findings and observations in the research as well as the purposive sampling method and current risk management practices, there are some recommendations that can be suggested such as:

1. Modernizing and improving the data collection from the data information structures, as well as making it accurate for utilizing in the risk management models (FHS).
2. More effective and advanced volatility filter models to understand the present nature of the volatility conditions affecting the market and evaluate the tail risk events.
3. Updating the current sampling methods, such as using the importance sampling methods or the bootstrap method, to accurately represent the current market conditions for FHS.
4. Examining the value output from the Value at Risk and Conditional Value at Risk measures, along using the present and validated historical losses.
5. Implementing training methods regarding advanced risk management techniques for employees involved in the risk management process so that they can understand and mitigate the factorial barriers affecting the modelling and simulations.

5.2 Conclusion

The research findings and the data from the survey indicate a vast difference between the relevant traditional financial risk management methods and the modern advanced present techniques, while still facing challenges in the fluctuating, volatile status of the current market conditions, depending on which volatile filter model is appropriate or which level of confidence is effective, such 95% or 99%. There have also been many issues and problems faced by FHS, such as restrictions on data necessary for the model to generate scenarios to emulate the variable conditions of the market and what measures can be taken in order to mitigate the potential losses beneath the limit of Value at Risk and while preparing strategies to counter the expected losses beyond the VaR limit. Many organizations have stated that FHS is either moderately effective or not effective in their risk management strategies during the decision-making process.

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Abbreviations:

- **FHS: Filtered Historical Simulation**
- **HS: Historical Simulation**
- **VaR: Value at Risk**
- **CVaR: Conditional Value at Risk**
- **MC: Monte-Carlo simulation:**
- **H.E: Highly Effective**
- **S.E: Semi-Effective**
- **Sl.E: Slightly Ineffective**

Appendices

Research Survey Form

Section-1 Current Practices

1) What Risk Management method does your organization use?

- Historical Simulation
- Filtered Historical Simulation
- Parametric Value of Risk
- Monte Carlo Simulation

2) Are the Risk management methods frequently updated?

- Daily
- Monthly
- Frequently
- Quarterly

3) Does your organization utilize Var/CVaR in the decision-making process for capital allocation, budgeting, and financial limiting?

- Extensively/Yes
- Partially/Occasionally
- Never used

4) What Confidence level is used for Value at Risk/Conditional Value at Risk?

- 95%
- 99%

5) Does your organization recheck the Value of Risk/Conditional Value of Risk Model?

- Daily
- Monthly
- Occasionally
- Infrequently
- None

6) How often does your Value at Risk model retest show exceptions or differences (Actual losses above the estimated Value at Risk)?

- Rarely (below 1%)
- Occasionally (1.5%)
- Consistently (Above 5%)

Section-2 Role in Organization

1) What is your role in the organization?

- Risk Management
- Portfolio Analyst
- Manager
- Quantitative Analyst
- Executive
- Senior Management
- Other

2) Which industry is your organization focused on?

- Banking
- Insurance
- Asset Management
- Conglomerate
- Other

3) What is the size of your organization?

- Small (Less than 1 billion)
- Moderate (1 billion - 10 billion)
- Large (10 billion - 100 billion)
- Vast (Above 100 billion)

4) What Sampling methods are used for your organization's risk analysis?

- Simple Random Sampling
- Block Bootstrap Sampling
- Copula-Based Sampling
- Importance Sampling

5) Is Extreme Value Theory or other Techniques for risk enhancement used in CvaR Estimates?

- Regularly
- Occasionally
- Considered
- None

6) Which cross-asset dependencies model is used in your organization's portfolio?

- Historical Correlations
- Dynamic Correlations
- Copula models

Section-3 Research Methodology & Sampling

1) Which assets have been exposed to market risk in your organization?

- Equities
- Fixed Income
- Foreign Exchange
- Commodities
- Derivatives
- Structured Products
- Other

2) What Risk Management method is implemented towards subsidiaries or divisions in your organization?

- Centralized
- Semi or half centralized
- Decentralized
- None

3) What issues that your organization face in using Value at Risk and Conditional Value at Risk?

- Data Restrictions
- Estimating Tail Risk
- Complying Regulations & Policies
- Complex Computation
- Model Validity

4) How effective are the current Filtered Historical Simulation (F.H.S) estimates in understanding the extreme market conditions or events?

- Highly effective
- Slightly effective
- Semi-effective
- Not effective

Agree/Disagree questions from Research Methodology & Sampling

5) Is the present Value at Risk Estimates are reliable?

1. Completely Agree
2. Agree
3. Neutral
4. Disagree
5. Completely Disagree

6) Is the Conditional Value at Risk estimates regarding tail risk are satisfactory?

1. Completely Agree
2. Agree
3. Neutral
4. Disagree
5. Completely Disagree

7) Do the current sampling methods utilized by the organization represent the current market condition?

1. Completely Agree
2. Agree
3. Neutral
4. Disagree
- Completely Disagree

8) Is improvement needed for estimating market risk?

- 1) Completely Agree
- 2) Agree
- 3) Neutral
- 4) Disagree
- 5) Completely Disagree

Attached copy of the internship organisation's confirmation/acceptance letter



www.hnsautomobiles.com

Date: 28 September 2025

Ref: hr/hns/2025/09/3611

Jennifer Hossain
Director- International Affairs &
Career Service Officer
University of Liberal Arts Bangladesh.

Subject: Acceptance of Internship.

Dear Sir,

We are pleased to inform you that the HNS Group has decided to accept the proposal for internship of **Mr. Ahmed El Alam**, Student ID No - 211011011, Department of Bachelor of Business Administration (BBA).

He will complete his internship under the direct supervision of **Bipul Kumar Saha** – General Manager, Finance & Accounts of HNS Group.

His training timing will be from 10.00 am to 6.00 pm, 5 days per week, and the duration of Intern is for Ten (10) weeks starting on 5th October 2025. Regularity & obedience of Company rules & regulation is expected from his during his intern period at this Company.

Thank you.

Yours sincerely,



Lt Col Md. Wahiduzzaman (retd)
Director, Operations
HNS Group

- Cc: 1. CEO & Chairman, HNS Group
2. GM, Accounts & Finance, HNS Group
3. Personal File

Page 1 of 2

INTERNSHIP PROPOSAL FORM

Name:	Ahmed El Alam
ID:	211011011
Department:	ULAB School of Business
Supervisor's Name (Faculty):	Ms. Arzoo Ismail
Organization Name:	HNS Group
Internship Title:	: Analyzing Market Risk Estimates of a Conglomerate in Bangladesh

Student's signature & date

Supervisor's signature & date

(Submit your Research Proposal to your Supervisor for approval)