

MATHEMATICAL STATISTICS AND MODELS IN DIGITAL BANKING AND FINANCE

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ABSTRACT

The purpose of the article is to study the role of mathematical statistics and modeling in banking and finance and to fundamentally reform such important issues as the use of this methodology in these areas that are important for the state.

Keywords: *digital banking, finance, deposits, statistics, mathematics, bank industry, business, interest rate, fee, investments, account, credit, payment, loan, risk, budgeting, customers, financial markets, economic trends, political changes, models, financial system.*

АННОТАЦИЯ

Цель статьи - изучить роль математической статистики и моделирования в банковском деле и финансах и кардинально реформировать такие важные вопросы, как использование этой методологии в этих важных для государства сферах.

Ключевые слова: *цифровой банкинг, финансы, депозиты, статистика, математика, банковская отрасль, бизнес, процентная ставка, комиссия, инвестиции, счет, кредит, платеж, заем, риск, бюджетирование, клиенты, финансовые рынки, экономические тенденции, политические изменения, модели, финансовая система.*

INTRODUCTION

A concise introduction highlighting the foundational role of mathematics in enabling precise financial analysis and decision-making within the banking and finance industry.

So far, you must have got the idea that mathematics is not just limited to dry textbooks. Let us address the role of mathematics in the finance and banking sector. You shouldn't be of the notion that international commerce is not based on mathematics, because a central portion of the trade is mathematics. Mathematics always has a central role to play in predicting the rise and fall of stock markets. In fact, it is with the help of mathematics, that stockbrokers are able to make you a substantial fortune.

Main part

Extensive Maths is involved in keeping track of the money in a bank. Banking is a world of numbers and Mathematics is used in the way accounts are handled for

calculating interest rates and for determining credit scores. Mathematics and Banking are tightly linked. Banking requires constant use of mathematics. The use of mathematics is to express, reason, and prove the underlying principles of finance. From the nature of financial mathematics, financial mathematics is an important branch of finance. Therefore, financial mathematics is completely based on the background and foundation of financial theory.

Math is very important in banking. You need to understand the time value of money. Depending on the complexity, this can require multiplication, division, addition and subtraction. Most of the math is very simple but is definitely required. Banking is again an option to work in a bank, a thorough knowledge of finance and mathematics is highly required. You can sit for various other government jobs examination. You can have a flourishing career after 12th commerce with mathematics if you choose designing. Mathematics makes our life orderly and prevents chaos. Certain qualities that are nurtured by mathematics are power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills. Mathematical Applications focuses on extending the mathematical skills and knowledge of students in both familiar and new contexts. Some of these contexts include financial modelling, matrices, network analysis, route and project planning, decision making, and discrete growth and decay. While minimal math studies are required for all business majors, finance happens to be one of the most quantitative fields. To learn essential skills such as analyzing and assessing investment performance and financial planning for savings goals, you must acquire a solid foundation in mathematics.

Mathematics is an essential part of banking and finance. From calculating interest to predicting future economic trends, math plays a vital role in the banking and financial industry. Mathematical models are used to help bankers make decisions, from administering loans and calculating profits to forecasting economic performance in the future. With the ever-changing financial markets, banks must stay updated with current mathematical models to ensure accuracy and efficiency in their operations. There are some advantages of mathematical statistics and models in banking and financing system:

First. Calculating Interest Rates and Loan Payments

One of the essential uses of math in banking is calculating interest rates and loan payments. Banks use complex algorithms to determine the interest rates for loan products, such as mortgages and student loans, and to estimate how much a borrower can afford to repay.

Banks also use math to calculate the amount of interest that will be earned on deposits and investments and the fees that will be applied to specific products and services. By understanding how mathematics is used in the banking industry, customers can ensure they get the best deal on their loans, deposits and investments.

Second. Assessing Risk and Return on Investments

Bankers must understand the risks associated with investing in different products, so they use mathematical models to calculate the expected return on each investment.

Bankers must be able to assess the potential risks associated with lending money, and mathematics is an invaluable tool for this purpose. By using calculations to determine a borrower's risk level, bankers can guarantee they don't overextend themselves with too volatile an investment. Knowing which investments are worth the risk and which are optional for everyone in the banking industry.

Third. Budgeting & Spending Decisions

Budgeting and spending decisions are crucial elements of any financial plan. People use math to determine their incomes and expenses, figure out their debt levels, and compare prices of different items to find the best deals. Math is also used to determine the best budgeting and spending decisions.

Calculating the cost of goods over time, budgeting for purchases, and determining one's debt-to-income ratio are all tasks that require mathematics. Also, the total cost of borrowing money, including interest rates, can be ascertained through calculations, and various loan options can be compared. Lastly, math can be employed to evaluate the risks associated with taking action.

Forth. Calculating Insurance Premiums

Insurance companies use mathematical equations to determine the cost of insurance premiums for their customers. This involves considering the customer's age, sex, health, driving record and more.

Companies also use probability and statistics to determine the likelihood of an insured event happening and to calculate the potential cost of the covered event. This allows them to choose how much to charge for their policies. It also allows them to create incentives to help customers save money on their insurance premiums.

Fifeth. Making Financial Forecasts

Making financial forecasts is an important way that math is used in banking. Banks use financial forecasting to predict the future of their investments, loans and other business decisions. This forecasting is done by analyzing factors such as consumer spending habits, economic trends, and political changes.

Banks use mathematical models and algorithms to simulate different outcomes and make the best investment decisions. Financial forecasts also help banks set financial goals for their future, so they can plan and prepare for any potential problems.

Sixth. Calculating Profits & Losses

Calculating profits and losses is a crucial aspect of any banking job. Calculating gains and losses are vital to determine a bank's financial health. Banks must also be able to accurately calculate how much money they will make or lose in any business venture.

Banks also need to understand the risks they're exposed to when investing in different types of assets. Calculating profits and losses helps banks assess the risk of a particular investment and make informed decisions.

Banks must also be able to use complex mathematical formulas and calculations to anticipate future profits and losses accurately.

Seventh. Setting Up & Tracking Retirement Plans

Setting up and tracking retirement plans is one of the most critical ways math is utilized in banking. Retirement plans such as 401(k)s, IRA's, and Roth IRA's require complex calculations to determine how much to contribute, how much will be taxed, and how much can be withdrawn at retirement.

Furthermore, financial advisors must use mathematical models to project how specific retirement plans will perform over time and make recommendations accordingly. As a result, a firm grasp of mathematical concepts is essential when setting up and tracking retirement plans in the banking industry.

Eighth. Calculating Loan Interest Payments

Interest is a fee charged for borrowing money, usually expressed as a percentage of the principal amount of the loan.

To calculate the interest rate, banks use various mathematical formulas that account for the principal amount, the length of the loan, and the interest rate.

Accurately calculating loan interest payments is essential for banks to guarantee they are adequately compensated for the money they lend. This helps them determine the total interest due, the monthly payment amount, and the total due at the end of the loan period.

CONCLUSION

Math is essential for banking, from basic calculations to more complicated statistical analysis. Math is used in banking to assess risk, calculate interest rates and fees, analyze investments, and create financial models and projections.

Math helps banks better understand their customers and develop tailored products that meet their needs. Banks need math to remain profitable, efficient, and competitive.

Number sense and a facility with mathematical concepts is especially useful in banking. We use math for budgeting, spending, saving, and investing. In each case, a good understanding of mathematical concepts will be beneficial for your personal finances. Since banking refers to managing money, we are all essentially “bankers” in our own lives. This scientific or mathematical approach to decision-making leaves out the guess work and ensures that companies have a reasonable expectation of a high return and low risk before making business or finance decisions.

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