

CAREERS THROUGH MATHS: FINANCE ANALYST



JOB DESCRIPTION

A Finance Analyst is a professional who scrutinises financial data to identify trends, assess performance, and provide actionable insights that guide a company's strategic decisions. On a daily basis, they are responsible for building complex financial models in Excel, preparing monthly management accounts, tracking key performance indicators (KPIs), and creating detailed reports and forecasts for senior stakeholders. The work environment is typically a fast-paced office setting within the finance department of a large corporation, a bank, an investment fund, or a professional services firm like one of the "Big Four" (PwC, Deloitte, EY, KPMG). Many also work in the public sector for organisations like the NHS or local authorities.

The core of the role involves deep mathematical analysis. An analyst at a FTSE 100 company, for instance, might be tasked with modelling the five-year financial impact of a proposed merger or acquisition, requiring sophisticated discounted cash flow (DCF) analysis and scenario planning. Another key duty is variance analysis, where they mathematically compare actual financial results against the budget or forecast to explain the reasons for any discrepancies, such as why a marketing campaign's return on investment (ROI) was 15% lower than projected. This involves dissecting large datasets to isolate the mathematical drivers of performance.

Ultimately, the Finance Analyst acts as a bridge between raw numerical data and strategic business intelligence. They transform complex mathematical outputs into clear, concise presentations for non-finance colleagues, enabling data-driven decision-making at all levels of the organisation. Their work is central to securing

funding for new projects, optimising operational efficiency, managing risk, and ultimately driving profitability and growth for UK businesses.

HOW MATHEMATICS IS USED

- **Financial Modelling & Calculus:** The construction of financial models is the primary application of mathematics. This involves using calculus concepts, particularly for forecasting. For example, an analyst modelling growth for a UK fintech startup like Revolut would use differential equations to project user acquisition rates and revenue growth under different market conditions. Calculating the net present value (NPV) of a new infrastructure project, such as the HS2 rail link, requires integral calculus to sum the discounted value of all future cash flows, a fundamental task in corporate finance and investment appraisal.
- **Statistical Analysis & Econometrics:** Finance Analysts rely heavily on statistics to interpret data and make inferences. They use regression analysis to identify relationships between variables; for instance, analysing how changes in the Bank of England's base interest rate correlate with a retail bank's mortgage application volume. They also calculate probabilities to assess risk, such as determining the likelihood of a borrower defaulting on a loan for a high-street lender like Lloyds Banking Group, a key component of credit risk modelling.
- **Financial Mathematics & Algebra:** Core algebraic formulae are used daily for valuation and performance measurement. This includes calculating financial ratios (e.g., debt-to-equity, current ratio) to assess a company's health for a potential investment. They use the time value of money formula, $FV = PV(1 + i)^n$, to calculate the future value of pension fund investments or the present value of an annuity. Pricing a complex financial derivative for a trading desk in the City of London involves solving intricate algebraic equations to determine its fair value.
- **Data Analysis & Linear Algebra:** With the rise of big data, analysts use linear algebra for multidimensional data analysis. Techniques like principal component analysis (PCA) are used to reduce the dimensionality of large datasets, such as analysing the performance of hundreds of stocks on the London Stock Exchange to identify a few key underlying factors driving market movements. Matrix

algebra is fundamental to the algorithms behind portfolio optimisation software used by UK asset managers like Legal & General Investment Management (LGIM).

- **Statistical and Analytical Methods:** Beyond core maths, analysts employ a suite of analytical methods. Time series analysis is used to forecast future sales figures based on historical data, adjusting for seasonality (e.g., predicting Christmas sales for a retailer like John Lewis). Hypothesis testing is used to validate the effectiveness of a new business strategy—for example, testing whether a change in store layout at Tesco has led to a statistically significant increase in average customer spend. Monte Carlo simulations are used to model the probability of different outcomes in complex, unpredictable scenarios, such as assessing the risk of a new investment under thousands of potential market conditions.

KEY SKILLS & TOOLS

Skill/Tool	Application
Microsoft Excel	The quintessential tool for any UK analyst. Used for building dynamic financial models employing advanced functions (XLOOKUP, INDEX(MATCH)), pivot tables for data summarisation, and macros (VBA) for automation. For example, building a three-statement model (income statement, balance sheet, cash flow) for a client seeking investment.
Python/R	Programming languages used for advanced statistical analysis, machine learning, and automating data processing tasks. A UK analyst might write a Python script to scrape financial data from the London Stock Exchange website or use R to run a complex regression analysis on a large dataset of consumer spending habits.
SQL & Power BI/ Tableau	SQL is used to query large databases to extract specific financial data. Power BI or Tableau are then used to create interactive dashboards that visualise this data mathematically, turning KPIs and trends into easy-to-understand charts and graphs for senior management.
	Industry-standard platforms providing real-time financial data, news, and analytics. Used mathematically to pull historical share prices,

Bloomberg Terminal/ Refinitiv Eikon	calculate beta coefficients for stocks, and analyse company financials for comparative valuation. Ubiquitous in the City of London.
Accounting Software (SAP, Oracle)	Enterprise resource planning (ERP) systems that are the source of all financial data. Analysts must understand the mathematical structure of the general ledger and how to extract and interpret transactional data for reporting and analysis.
Presentation Skills (PowerPoint)	The crucial skill of distilling complex mathematical findings into clear, compelling narratives. Used to present a business case for a new investment to the board, explaining the mathematical assumptions behind a forecast and the projected ROI.
Attention to Detail & QA	Rigorous mathematical checking and quality assurance of all models and reports. This involves sense-checking formulas, ensuring internal consistency in models (e.g., that the balance sheet balances), and reconciling numbers back to source systems to guarantee accuracy.

Typical Pathway: The standard pathway begins with strong GCSEs (especially Mathematics and English) followed by A-levels in Mathematics and/or Economics. The most common route is to complete a bachelor's degree (2:1 or above) in a highly numerical subject such as Finance, Economics, Mathematics, or Accounting. Many top UK universities, including the London School of Economics (LSE) and Warwick Business School, offer specialised degrees. Graduates often start in entry-level positions such as Junior Finance Analyst or graduate schemes at large banks or corporations. Career progression typically leads to Senior Analyst, Finance Manager, and eventually Finance Director or Head of FP&A (Financial Planning & Analysis). Obtaining a professional qualification is almost essential; the most recognised in the UK are the Chartered Financial Analyst (CFA) charter for investment roles and the Chartered Institute of Management Accountants (CIMA) qualification for corporate finance roles, both requiring a series of rigorous exams.

Industry Demand: Demand for skilled Finance Analysts in the UK remains consistently high. According to the Office for National Statistics (ONS), roles in business and financial project management are projected to grow. This demand is driven by an increasing need for data-driven decision-making, regulatory complexity, and corporate focus on cost optimisation and strategic planning. Sectors with particularly strong demand include fintech, professional services, and the healthcare sector within the NHS, which requires analysts to manage complex budgets and model efficiency savings.

Real-World Impact: Finance Analysts play a critical role in the UK's economic health. They enable companies like AstraZeneca to allocate billions of pounds effectively towards life-saving drug research and development. They help sustainable energy firms like Ørsted model the financial viability of new offshore wind farms, contributing to the UK's net-zero targets. In the public sector, their analysis ensures taxpayer money is spent efficiently, influencing decisions on funding for schools, hospitals, and infrastructure projects that benefit communities across the nation. Their mathematical rigour provides the foundation for sound investment, growth, and long-term economic stability.