BNY MELLON

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Enhancing Short Term Cash Flow Model

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Introduction: BNY Mellon

Bank of New York Mellon (BNY Mellon) is a globally renowned financial institution with a rich history dating back over two centuries. Founded in 1784, it is one of the oldest banking corporations in the United States. Over the years, BNY Mellon has evolved into a leading player in the financial services industry, offering a wide range of financial solutions to clients worldwide.

An Overview

BNY Mellon's extensive services include custody, securities lending, fund accounting, and asset servicing, catering to a diverse client base in over 100 markets. The bank's reputation as a trusted custodian ensures the safety and security of clients' assets, making it a vital player in the global financial landscape.

Corporate Treasury

Corporate Treasury is a crucial department within BNY Mellon responsible for managing the bank's financial resources, liquidity, and capital to ensure financial stability. This entails the following tasks:

Liquidity Management

Corporate Treasury oversees the bank's liquidity, monitoring cash flows to ensure sufficient liquidity is available to meet financial obligations at all times.

Asset-Liability Management (ALM)

Corporate Treasury balances the bank's assets and liabilities to minimize risk and optimize returns.

Short-Term Cash Flow Forecasting

Corporate Treasury accurately forecasts short-term cash flows, allowing efficient allocation of financial resources and meeting operational requirements.

Capital Management

Corporate Treasury manages the bank's capital to maintain regulatory requirements and ensure financial stability.

Risk Management

Corporate Treasury identifies, assesses, and mitigates financial risks faced by the bank, safeguarding against adverse events.

BNY Mellon's Corporate Treasury is essential for managing the bank's financial stability, liquidity, capital, and risk, contributing significantly to the institution's success in the financial industry.

Introduction

During my internship at Bank of New York Mellon (BNY Mellon) in the ALM Modelling Team within Corporate Treasury, I had the opportunity to work on enhancing the short-term cash flow forecasting framework used by the bank. As someone with a background in Mathematics and Computer Science, this internship provided me with valuable insights into the world of finance and the workings of a major financial institution. This report outlines the project I worked on, the methodologies employed, the results obtained, and my overall internship experience.

Project Overview

Old Framework

The existing cashflow forecasting framework used by BNY Mellon was based on a qualitative approach. It relied on seasonal dummies to adjust the initial balances, ensuring that days with seasonal or anomalous behaviors were appropriately handled. These seasonal days were identified based on the business's qualitative judgments and analyses. The calculation of seasonal dummies involved grouping the changes in deposits for each particular active day type. The average of all observations was then taken to extract the seasonal dummy value for that day. The framework considered days from four different perspectives: Day of Month, Day of the Week, Business Day from the Beginning of the Month, and Business Day from the End of the Month.

New Framework

Our objective was to enhance the existing framework by adopting a more quantitative approach to identify seasonal days and improve forecasting accuracy. We did this in two phases.

Stage 1: Identification of Seasonal Days

To achieve this, we developed a quantitative framework that could identify seasonal days using data-driven techniques instead of relying on qualitative judgments. We introduced two additional day-type representations: Week of Year and Day of Fiscal Quarter. With these new representations, we expanded the scope of seasonality analysis. Each strategy employed a set of statistical tests to assess seasonality for a given day in each day-type representation. The result was a seasonality score assigned to each day based on each strategy. By cumulating these seasonality scores and applying defined thresholds, we flagged days as seasonal or nonseasonal.

Stage 2: Forecasting using the Identified Seasonal Days

In the second stage, we aimed to improve cash flow forecasting by incorporating the identified seasonal days more effectively. We proposed various enhancement strategies to achieve this, such as employing simple averaging and weighted addition based on seasonality scores. These methods allowed us to leverage the identified seasonality patterns more efficiently and fine-tune the short-term cash flow forecasts.

Results and Impact

The new proposed framework demonstrated significant improvements over the old framework in various metrics relevant to cash flow forecasting.

Firstly, the identification of seasonal days using a quantitative approach led to the flagging of a larger number of days as seasonal compared to the qualitative approach used in the old framework. This refinement allowed for a more accurate representation of seasonal patterns in cash flow data.

Secondly, the implementation of the enhanced forecasting methodologies based on the identified seasonal days resulted in improved forecast accuracy. Key performance metrics, such as Mean Absolute Percentage Error (MAPE) and directional accuracies of change in deposits, showed notable enhancements, indicating better forecasting outcomes.

Thirdly, this data driven quantitative approach enabled us to use seasonal dummies across all the LOBs with respect to multiple currencies, which was not possible before.

Overall, the new proposed framework provided the Bank of New York Mellon with more precise and reliable short-term cash flow forecasts, enhancing decision-making processes across all Lines of Businesses (LOBs).

Internship Experience

Opportunity for Learning Finance

As someone with a background in Mathematics and Computer Science, my internship at BNY Mellon was an excellent opportunity to delve into the world of finance and deepen my understanding of financial concepts and practices. Being immersed in the day-to-day operations of a major financial institution allowed me to witness firsthand how finance principles are applied in a real-world setting.

Suitable Placement in ALM Modelling Team

I was fortunate to be placed in the ALM Modelling team within Corporate Treasury, as this perfectly aligned with my academic background. The team's focus on mathematical and statistical modeling and data analysis provided me with the ideal platform to apply my skills in a finance-oriented context.

Enjoyment in Project Work

The project I worked on was a particularly enjoyable aspect of my internship. It required creative thinking and innovative approaches to develop various strategies using statistical methods. Collaborating with experienced professionals in the team and contributing to a project that had tangible impact was truly rewarding.

Supportive Managers and Colleagues

Throughout my tenure at BNY Mellon, my manager played a crucial role in guiding and supporting me. His mentorship and constructive feedback allowed me to grow both professionally and personally. Additionally, the collaborative and supportive nature of my colleagues made the overall internship experience more enriching.

Team Bonding Sessions

The team bonding sessions, including trip to Mahabalipuram, lunches, and dinners, were a delightful aspect of my internship. These informal interactions fostered a positive work culture and encouraged camaraderie among team members.

Conclusion

My internship at BNY Mellon was a valuable learning experience. The project to enhance the short-term cash flow forecasting framework allowed me to explore finance in a practical setting and apply my skills to real-world challenges. The support and guidance provided by my manager and colleagues, along with the enriching team bonding sessions, made my 10-week tenure truly enjoyable.