Looking for Alpha—

Harnessing the Power of the Cloud to Transform Spreadsheets into Scalable Objects and Increase Returns

CWAN
Case Study

PIMCO

INTRODUCTION

PIMCO is one of the world's premier fixed income investment managers. With its launch in 1971 in Newport Beach, California, PIMCO introduced investors to a total return approach to fixed income investing. In the 50 years since, the company has continued to bring innovation and expertise to its partnership with clients seeking the best investment solutions. Today they have offices across the globe and professionals united by a single purpose: creating opportunities for investors in every environment.
PIMCO has $1.69 trillion in assets under management including a significant presence in alternative investments, with more than $150 billion in alternative assets under management. Combining innovation and expertise, PIMCO develops proprietary quant-based performance attribution models of their investments, increasing the clarity and flexibility of sources of risk and return. These models are computation and data intensive, combining multiple factors across decades of market and internal data.

PIMCO has been working closely with Beacon by CWAN since late 2017, using the cloud-based platform to improve PIMCO's capabilities to deploy analytics to their global interest rate portfolio management teams. In addition, PIMCO has a strategic partnership with and acquired a minority stake in Beacon in May 2018.

PROBLEM

“We want to combine the agility and control of spreadsheets with the scalability of a cloud-based technology platform.”

Sudi Mariappa

Managing Director, Head of Analytics, PIMCO

Spreadsheets are pervasive in the alternative investment community – they offer an easy way to communicate internally and with outside parties about the deal model. These investments are highly bespoke, and deal models are hard to standardize. Excel is the quintessential low-code solution for prototyping these use cases. But problems can arise when analyzing deal values and feeding into broader risk management systems. The desired analysis and calculations can become too heavy for an individual spreadsheet and push the boundaries of local computational power. It can also be challenging to systematically evaluate the models and verify that spreadsheets received from counterparties are doing what they claim.

PIMCO aims to reduce reliance on spreadsheets and move analytics to a more scalable platform for scenario analysisand stress testing. PIMCO believes other approaches, including using quants to translate deal economics into code, enforcing guidelines around spreadsheet construction, and maintaining internal libraries for common analytics are time consuming, restrictive, and introduce the possibility of human error. PIMCO prefers to provide its teams the flexibility to work on different types of deals in the most effective and efficient manner and wants to be able to implement consistent guidelines when negotiating with counterparties. Ji Li and Lutz Schloegl from PIMCO’s portfolio management and analytics groups developed a proposal to address the spreadsheet conundrum, winning PIMCO’s internal 2021 Innovation Prize. Acknowledging that the lingua franca of their industry is spreadsheets and since the Beacon Platform is designed around dependency graphs, PIMCO proposed a collaboration with Beacon to leverage their technology to develop a process for automatically converting Excel models into Python.

PIMCO AT A GLANCE

- 50+ years creating opportunities for investors
- $1.69 trillion in assets under management
- 5+ years improving portfolio management capabilities with Beacon
- Proprietary models increase clarity and flexibility of risks and returns

KEY OBJECTIVES

1. Developing a solution that could improve work throughout the larger PIMCO organization, including asset management, portfolio analytics and optimization, compliance, back office, and across public and private deal teams
2. Reproducing what is in the spreadsheet independent of the calculation values, regardless of whether the underlying model is right or wrong, including any idiosyncrasies
3. Accommodating key differences in error handling, such as the value assigned to N/A entries
4. Not re-implementing a full spreadsheet application

SOLUTION

“We discussed the feasibility of creating a spreadsheet parser that automatically translates deal model spreadsheets into code objects on Beacon Platform, and they have been very receptive to the idea.”

Ji Li

Executive Vice President, Portfolio Manager, PIMCO

Utilizing the open file format for Microsoft Excel, Beacon began analyzing spreadsheets supplied by PIMCO to determine the best way to convert them to Python objects within Beacon Platform. The first few were challenging but could be transformed using some readily-available open source tools. Then PIMCO shared a more typical example – a massive spreadsheet that was 2 GB, with more than four million cells and almost one million functions and formulas. Deal teams often rely on these spreadsheets as a transaction journal, dragging and dropping different data sets about the assets in question, and storing other information beyond the deal evaluation function. While this is convenient for the team, it makes it very inefficient to load and calculate updated values.

Trying to read and parse this spreadsheet directly required an immense investment in time and energy; instead Beacon decided to take a closer look at the transform functionality. The development team found that by iteratively reading the spreadsheet and performing multiple levels of analysis to cache operations and factor out dependencies, there were only 160 unique formulas in the entire spreadsheet, not one million. With this insight and PIMCO’s inspiration, Beacon was able to produce an Excel Evaluator within a few months that could parse all of the sheets and cells of an uploaded spreadsheet into Python objects, maintaining the structure and its functionality. Supplemental functions can read the value of a cell, read the underlying data or formula, and change the value for recalculation. Leveraging the power of dependency graphs, individual calculations such as internal rate of return (IRR) are calculated during the initial loading. Recalculating values only requires loading the related objects and following the dependencies to see which variables have changed, enabling the elastic computation engine to run thousands of simulations and produce results in minutes or seconds.

ESSENTIAL DELIVERABLES

- Automated way to port spreadsheets to a flexible cloud platform
- Read and parse massive 2GB spreadsheets with more than four millions cells and one million formulas
- Upload and convert spreadsheet to Python objects while maintaining structure and functionality
- Enable elastic compute engine to run thousands of simulations and produce results in minutes or seconds

GREATER INSIGHTS

- Accelerate innovation and adaptability with Beacon's Excel Evaluator
- Readily scale for more complex analytics and greater range of sensitive analyses
- Quickly run desired sensitivity scenarios and compute spreads and correlations
- Enable more exhaustive analysis and produce more comprehensive views of the deal

RESULTS

“By using the Beacon platform we are increasing the speed of our innovation cycle and driving down the cost to explore our data and leverage our analytics.”

Dirk Manelski

Managing Director, Chief Technology Officer, PIMCO

Adding Excel Evaluator to their toolbox is accelerating PIMCO’s ability to innovate and adapt to different types of deals. The engineering and analytics teams realized early on that asking internal and external deal teams to shift all at once to a different platform was not a feasible approach. While technically more challenging, developing an automated way to port spreadsheets to a flexible cloud platform like Beacon was a better way to solve the problem.

Excel Evaluator is still in the early stages of deployment at PIMCO but is already demonstrating its ability to scale for more complex analytics, perform a greater range of sensitivity analyses, and increase consistency across the entire alternatives portfolio. PIMCO engineering wrote a unit test suite to validate the functionality and confirm that the imported version is giving the same answers as the original. Deal teams also do black box input/output testing after each evaluation to ensure that the imported objects are behaving as expected, running scenarios with varied inputs.

Once the deal models have been evaluated and converted to code objects, deal team members in areas such as risk and project management can ask quants to quickly run their desired sensitivity scenarios and compute option-adjusted spreads (OAS), correlation analysis, and other advanced analytics. The elastic compute resources provided by Beacon Core quickly scale up or down based on the need, making deal monitoring faster and less manual with fewer resources. When working with short timelines, multiple counterparties, and decision deadlines, the increased ease and efficiency of Beacon-based models are enabling more exhaustive analysis and producing a more comprehensive view of the deal. The result is greater insight into the potential risks and returns of the transaction.

Clearwater Analytics (NYSE: CWAN) is transforming investment management with the industry's most comprehensive cloud-native platform for institutional investors across global public and private markets. White legacy systems create risk, inefficiency, and data fragmentation, Clearwater's single-instance, multi-tenant architecture delivers real-time data and AI-driven insights throughout the investment lifecycle. The platform eliminates information silos by integrating portfolio management, trading, investment accounting, reconciliation, regulatory reporting, performance, compliance, and risk analytics in one unified system. Learn more at www.cwan.com.