

Home Lender Transforms Risk and Portfolio Management via Long-Standing Relationship with Numerix's PolyPaths

Key Highlights

- In 2009, XYZ Home Lending entered an engagement with Numerix's PolyPaths, implementing a desktop implementation for managing its risk profile.
- Over the years, XYZ extended the use of PolyPaths solutions by replacing several in-house trading and risk systems.
- Today, 14 years since the inception of the relationship, XYZ Home Lending has transformed risk and portfolio management using the full PolyPaths product suite.

Background

This case study reflects a 14-year journey involving a client-vendor partnership between "XYZ Home Lending" (client anonymity maintained) and Numerix's PolyPaths. During the course of this relationship, XYZ faced several risk and portfolio management challenges that it asked PolyPaths to address—and what started as a small desktop implementation in 2009 has resulted in XYZ leveraging PolyPaths full product suite of fixed income analytics solutions today.

Growing a Successful Partnership Over Time

Below we review a timeline of events and technical details surrounding XYZ's long-standing relationship with Numerix's PolyPaths for the firm's comprehensive set of quantitative needs.

2009: Risk Management Enhancements

In 2009, XYZ's MSR (mortgage servicing rights) hedging desk was looking for ways to help manage its risk profile. In particular, they felt the analytics on their hedges (swaps, swaptions, futures, and future options) were not accurate in the current system and that the net convexity exposure was being understated.

Numerix's PolyPaths was brought in to devise a solution that could address this objective through a desktop operating system. The PolyPaths' team worked closely with XYZ's head trader as well as the quantitative analysis group that served the desk to automate their nightly valuation and risk runs for the universe of current and potential MSR hedges.

The MSR hedging desk group also had a number of specialized needs, such as specific swap date handling conventions for IMM (International Monetary Market) dates and a logistic model for TBA (To Be Announced) options. PolyPaths expanded the desktop operating system to accommodate these needs.

2010: Adding Analysis for Complex Portfolios

A year after PolyPaths onboarded the desktop system and enhanced the desktop user experience, and with the nightly risk process in place and running smoothly, XYZ expanded the client-vendor relationship by adding PolyPaths Distributed Processing (DP) to their contract. PolyPaths DP extends the desktop system to provide scalability and thus enables analysis of large portfolios with complex financial instruments within a client's desired time frame. DP's robust architecture allows it to scale with the size of a portfolio.

2011: Adding Analysis for Bulk Loan Valuations

Fast forward to 2011, a division of XYZ Home Lending that focused on bulk loan valuations learned about PolyPaths' desktop operating system and reached out for a demo. This group had its own customized front-end orchestration tool for loading different subsets of their loan portfolio and running cash flow forecasts and valuations and wanted a desktop system that could be integrated into that process, while also offering a GUI for users who wanted to do interactive analysis. They decided to move forward with PolyPaths and added several end users and 100 cores to their DP grid.

2013: Introducing Modeling Capabilities for MSR

Two years later, in 2013, with the existing implementations and processes running smoothly, XYZ's quantitative analytics team wanted to start modeling their mortgage servicing rights (MSRs) themselves to obtain a more accurate picture of the asset position they were actively hedging, using a consistent analytical framework. MSRs represent the capitalized value of the right to receive future cash flows from the servicing of mortgage loans.

At the time, the MSR asset portfolio was being valued using a combination of internal systems. As with many larger players, XYZ had their own custom prepay model for MSRs in addition to using a third-party model, Andrew Davidson & Co. (a PolyPaths partner). However, PolyPaths' own prepay API was needed to allow XYZ to return some specific MSR forecast cash flows components. With this extension from PolyPaths, XYZ was able to generate all the required MSR cash flow components, which meant it could now automatically generate all the risk measures and scenario valuations available in the system.

Since XYZ is subject to extensive regulatory oversight, a thorough model validation process was also conducted in which it vetted PolyPaths' market data fitting, BGM interest rate model, and risk analytics. PolyPaths passed this validation and the MSRs began to run through PolyPaths. This resulted in not only additional users, but a significant extension of its Distributed Processing grid, adding several thousand cores over the next few years.

2016: Adding Pre-trade Analysis

Further on into 2016, PolyPaths conducted a demo to XYZ's ABS trading desk, which was seeking a flexible tool that would allow it to do pre-trade analysis on both securities and whole loans. Stakeholders at the ABS desk realized PolyPaths would again be a good fit for this functionality and so moved forward with desktop system licenses.

2017: Optimizing Balance Sheet Forecasting

In 2017, the Investment Portfolio Group at XYZ approached PolyPaths to inquire about its risk analytics balance sheet forecasting (ALM) capabilities. At the time, XYZ relied on two widely used, vendor-provided risk and ALM systems, along with several internal tools and spreadsheets and were looking to find a single tool that would address all its risk analytics and balance sheet forecasting needs. Numerix's PolyPaths responded by executing a Proof of Concept (POC) project plan.

Several stakeholder meetings were conducted, and onsite demos were provided. Biweekly WebEx sessions were held with the stakeholders and there were several office visits in order to train the various teams involved in migrating and running the investment portfolio. PolyPaths added desktop licenses for the Investment Portfolio Group team and worked through modeling the portfolio with the team, designing reports to feed downstream systems. After a successful 9-month POC, the Investment Portfolio Group moved forward with the PolyPaths solution.



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The Results

Today, XYZ Home Lender leverages the Numerix PolyPaths full product suite, boasting 100 users and more than 8,000 cores. Throughout working with XYZ, PolyPaths has always been willing to extend the system as needed to accommodate XYZ's requests, and their feedback has been invaluable in making the PolyPaths solution even more robust and flexible. To illustrate the extent of the relationship between PolyPaths and XYZ, the following are a list of groups using the solution:

- Investment Portfolio Group (IP)
- Macro Investment Portfolio
- Credit Investment Portfolio
- Portfolio Strategy & Analytics (PSA)
- Investment Portfolio Technology
- Mortgage Modeling Center of Excellence (Internal Quant group)
- XYZ Home Lending
- MSR valuation and hedging
- XYZ Securities, Capital Markets
- XYZ Securities, ABS Trading
- Corporate Market & Institutional Risk

Final Thoughts & Takeaways

In summary, XYZ Home Lending's 14-year client-vendor partnership with Numerix's PolyPaths has led to transformative advancements in their risk and portfolio management capabilities. The collaboration's success is marked by the adoption of a comprehensive suite of fixed income analytics solutions, extensive scalability, and continuous system enhancements tailored to meet the firm's evolving needs. An overview of key benefits XYZ Home Lender achieved working with PolyPaths is as follows:

- Enhanced scalability and automation of risk management processes
- Accurate and timely analysis of large portfolios with complex financial instruments
- Extended modeling coverage for MSRs
- Flexible pre-trade analysis
- Single, powerful solution for risk analytics and balance sheet forecasting needs

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