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Navigating the evolving ALM technology landscape

Trends and implications

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01. Introduction

In this whitepaper, we analyze the latest technological developments in the field of Asset Liability Management (ALM) for banks and answer the question: what to consider for the selection of a new ALM software.

First, we define the scope of ALM solutions and differentiate between general IT (mega)trends and specific ALM aspects. Then, we investigate the current challenges and implications for the further development of ALM capabilities in detail.

We observe that technological trends have expanded the solution space for banks, emphasizing the importance of a detailed and comprehensive analysis of individual requirements to select the most suitable solution.

Although the opportunities have increased, there is also an elevated risk of becoming overwhelmed by the multitude of potential implementation scenarios.

02. Overview of the current situation

ALM is a fundamental task in banking that involves effectively managing the opportunities and risks stemming from the structure of the balance sheet. It entails finding the optimal offset between the business strategy (including customers, markets, profit centers, etc.) and the risk strategy (capital adequacy, liquidity adequacy, etc.). Risks considered in ALM primarily include liquidity risk and interest rate risk in the banking book (IRRBB). Recent crises have once again highlighted the importance of managing these risks adequately[1].

2.1 Differentiation of ALM systems from regulatory reporting as well as front-office applications

An ALM system can be utilized for treasury management, financial planning, and risk controlling. When implemented holistically, it offers extensive capabilities to multiple departments within a bank. In the following, we differentiate classical ALM systems from both trading systems/treasury management systems and regulatory reporting systems.

Trading systems
Trading systems/treasury management systems are front-office applications designed for entering and processing transactions. In particular, trading systems typically incorporate state-of-the-art valuation functions but little or no behavioral modeling capabilities.

In contrast to front-office systems, ALM solutions are back-office systems that are usually not used for position keeping. The primary focus of ALM systems is on conducting analyses, computing KPIs and generating internal reports. These systems offer comprehensive modeling functionalities, including behavioral models. Going further, ALM systems provide the capability to simulate the development of the entire balance sheet while employing consistent scenarios over an extended time horizon. However, valuation functions are generally less sophisticated compared to trading systems.

1 https://www.federalreserve.gov/publications/files/svb-review-20230428.pdf

ALM Asset Liability Management Systems

Data: End-of-day
Scope: Analysis and reporting for liquidity risk, interest rate risk, FTP, balance sheet management, stress testing, ...
Modeling capabilities: Typically, constrained valuation functions but highly advanced behavioral modeling

RR Regulatory Reporting Systems

Data: End-of-day / end-of-month
Focus: External regulatory metrics
Modeling capabilities: None (or very limited) internal modeling

TMS Treasury Management /Trading Systems

Data: Real-time / near-time view
Scope: Deal capturing and processing
Modeling capabilities: Advanced valuation, none (or very limited) behavioral modeling

Figure 1: Classes of software solutions and their relation to ALM. During a system selection, possible requirements from front office and regulatory reporting should also be evaluated.

Regulatory reporting systems

When we include regulatory reporting systems into the consideration, it can be noted that these systems are specifically designed for external reporting to regulatory authorities. The regulatory reports follow externally defined guidelines, and the results must be submitted to the regulator in a predetermined format (e.g. XBRL). This means that regulatory reporting systems are fully tailored to meet the external requirements, not only in terms of modeling but also in terms of the structure of the key metrics. This sets them apart from ALM solutions (which predominantly take an internal view).

Exceptions to the rule

Lastly, it should be noted that the boundaries between the system classes outlined here can be somewhat fluid. There are, of course, individual ALM systems that can also be used for position capturing or (selected) regulatory metric calculations. However, the chosen differentiation allows for a more precise discussion and evaluation of the actual needs of banks in the following.

2.2 Distinguishing between overarching IT banking trends and specific ALM topics

In every system selection project for a new IT component, the fundamental question arises: Should the component be developed in-house (“make”) or acquired from external vendors (“buy”)? We will see in the following that a third way is emerging, particularly also for ALM solutions, which we call “hybrid” approach.

Open software and the benefits from cloud computing

Banks are currently confronted with the challenge of replacing their legacy systems and establishing a modern, efficient, and cost-saving IT infrastructure. In this context, the transition to the cloud plays a significant role[2]. While this aspect is not specific to ALM systems, banks must consider whether the new solution should be operated on-prem[3] or in the cloud, and which operating model should be employed in a cloud approach (Software-as-a-Service, Infrastructure-as-a-Service, etc.).

Cloud solutions offer optimization through scalability options and (depending on the operating model) allow for certain responsibilities to be outsourced, e.g., eliminating the need for inhouse maintenance. On the other hand, there are consequences associated with outsourcing, which involve high hurdles and regulatory

2 Banking Cloud Altimeter Volume 6 | Accenture

3 Operated on the bank’s own infrastructure (on-premise often abbreviated as on-prem)

burdens[4] for banks[5]. If a cloud solution is in focus, the system in question should be examined to determine whether it is simply an on-prem solution being migrated to the cloud (cloud-ready) or even cloud-native. The level of optimization that can be achieved through cloud operation depends heavily on the technological level of maturity. Cloud solutions are as a starting point less efficient because the separation of various tasks causes overhead. However, when implemented correctly, they can enhance scalability. Concrete advantages include simplified and reproducible setup of test systems through containerization, increased standardization, streamlined backup and recovery processes, improved process efficiency, and better utilization of system resources. As a result, it becomes possible to offset the initial overhead.

Cloud-optimized technologies are based on a microservice architecture, which allows for the encapsulation and distribution of processing steps. This implies that calculation components are less monolithic, and individual components can be directly accessed through API calls. It is important to note that a system does not necessarily have to be operated in the cloud to leverage some of the advantages. Rather, optimizing for cloud operation leads to greater encapsulation and openness of software, which theoretically can also be utilized on-prem.

Customization made easy

Nowadays, with advancements in technology, users are furthermore increasingly able to leverage programming languages (mostly Python) to directly extend the functionality of a software. Scripting languages allow for customizing within standard software. This extensibility is a major advantage, especially for ALM use cases. For example, in behavior-based modeling, the employed business logics are often very specific to a single bank. Modelling components like deposit run-off or drawdown of contingencies can be customized to meet individual requirements.

Standard technologies are utilized to develop a customized product

If one thinks further about this step towards open system architectures, it leads to platform solutions. These are analytical / data aggregation technologies that can also be used for ALM use cases. Platform solutions are typically not fully integrated ALM systems that cover the complete standard range of functions out-of-the-box (such as interest rate risk, liquidity risk, FTP, balance sheet simulation, etc.) once the bank-specific data is integrated into the system. Instead, analysis and aggregation functions are deployed in conjunction with ALM libraries. This naturally provides immense freedom for the user but also requires the development of the final solution within a modular framework (a make/buy hybrid). This market trend can also be observed through mergers of data analytics specialists with traditional ALM niche experts[6]. It is evident that a careful consideration regarding the desired level of standardization is necessary.

Getting data in and out of the system

Data management is an overarching topic – not only in banking. Bank-specifically, there are several factors: the multitude of data sources (typically multiple core systems, market data, counterparties, planning data, model parameters, etc.), the typically high number of interfaces between systems and the strict regulation regarding data governance, especially for large institutions under the supervision of the ECB[7].

We would like to discuss the ALM specific aspects of data integration using the example of IRRBB reporting requirements for banks[8]. To fulfill the EBA reporting requirements, two aspects need to be considered. Firstly, granular modeling needs to be performed, and secondly, an externally mandated reporting format must be filled, which may change as part of the evolution of regulatory reporting stand-

4 Such as outsourcing governance, risk analysis, exit plans / options for action etc.

5 Rundschreiben 06/2024 MaRisk (bafin.de), AT 9 Auslagerung

6 ALM Technology Systems, 2023: Market Update and Vendor Landscape - Chartis Research (chartis-research.com)

7 Guide on effective risk data aggregation and risk reporting (europa.eu)

8 Implementing Technical Standards on Supervisory Reporting amendments with regard to IRRBB reporting | European Banking Authority (europa.eu)

ards. As discussed in the previous part, regulatory reporting systems typically do not possess the required modeling capabilities, and ALM systems cannot generate reports in the regulatory framework format or changes in the reporting taxonomy are not updated immediately. As a result, different banking systems often need to exchange data with each other in order to achieve the final outcome and combine "the best of both worlds".

A potential approach is through the utilization of a centralized data platform, such as SAP's Financial Services Data Management and Platform (FSDM/FSDP). In this scenario, data is extracted from the central "source of truth" and loaded into the ALM system using standard interfaces (provided there is an appropriate adapter). The resulting data (e.g., granular IRRBB results on single contract level) is then written back to the central data platform. From there, the IRRBB simulation results can be imported into the regulatory reporting system (again using a standard interface), where the final report can be generated.

Another possibility is to establish a direct interface between the ALM system and the regulatory reporting system[9].

It becomes evident that the choice of the optimal approach depends heavily on the bank's existing or anticipated technology stack. Is there a central data platform? Are there standard interfaces between individual specialized systems? It is clear that interfaces are a central driver of complexity and effort in an integration project. Even if standard interfaces are available, it needs to be clarified to what extent the bank can (and wants to) adhere to a given standard. Extension with respect to standardized data structures often negate efficiency gains.

How precise is precise enough?

When choosing the ALM solution, one must consider the level of valuation capabilities required – including the pricing of new business. Particularly for banks with a trading book, advanced valuation methods may be necessary for a wide range of products. Additionally, maintaining consistency in valuation methods across the bank is desirable. Therefore, it needs to be determined whether an ALM software can process all products using the desired valuation models and how much they deviate from the existing (front-office) valuation functions.

While it is often possible to generate valuation results externally and deliver them to an ALM system, the significant advantage of simulating the entire balance sheet consistently in one system might be lost. There is also the aspect that a simulation of the development of the balance sheet needs lots of assumptions. Therefore, it is not clear if much is to be gained by more precise valuation models.

If the ALM system employs an open architecture, it may be possible to integrate an external valuation library. However, at least the implications for performance and process control must be considered as well.

9 For example see the partnership of Regnology and SS&C Algorithmics

03. Navigating complexity

In the following, we will provide insights into some key aspects that we believe are crucial when selecting a modern ALM solution.

Scope of application
As mentioned in the definition of ALM systems, they can serve a comprehensive range of functional areas within a bank. On the other hand, vendors often offer modular pricing strategies, allowing for the licensing of individual modules (such as liquidity risk, FTP, balance sheet simulation, ...) separately. The benefit of using a solution for the entire bank naturally increases with the breadth of application. The (often elusive) ideal scenario is to model the entire bank as a cohesive unit. While this may not always be achievable, siloed solutions should be avoided whenever possible.

Therefore, when selecting an ALM system, it is important to examine the multiplier effects within the bank. For instance, it is advantageous if the risk view of IRRBB, based on static balance sheet assumptions in risk control, can be simulated consistently with bank planning scenarios in financial controlling, resulting in a dynamically evolving balance sheet. From an overarching bank perspective, onboarding additional stakeholders is therefore a clear asset – even in cases where the system selection project originally started with a very limited initial scope (e.g. only liquidity risk).

ALM systems partially or entirely overlap with solutions for market risk, credit risk, and other areas. When attempting to minimize the number of IT solutions, it may result in compromises in the functional coverage for specific use cases. Based on the overarching functional requirements, the best fit needs to be identified.

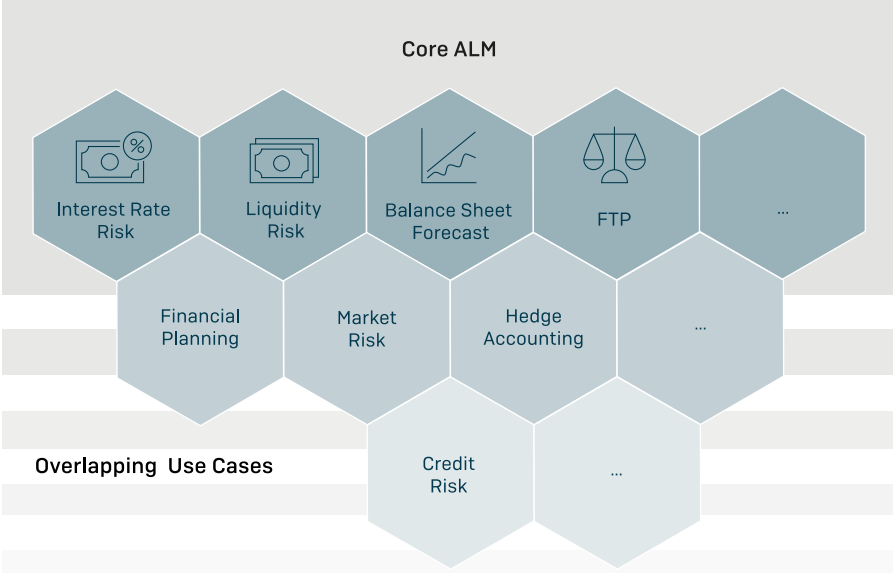

Figure 2: Scope of application - only ALM or extension to overlapping topics beyond?

Level of standardization
It is important to evaluate the integration capabilities for both existing and anticipated systems and processes. If there is already an overarching data platform in place, it can be advantageous to seek out ALM solutions that have out-of-the-box communication capabilities with the platform through adapters. This can streamline the integration process and enhance data flow efficiency.

To answer this question, one must consider: How standardized is my business? Can I map my transactions and banking processes in standard software, or will I have to stretch the standard too far in an integration, thus losing the benefits? Choosing the standard may require aligning the business model with standardization, which could result in certain products or product variations not being feasible.

On the other hand, if there is a desire for a high level of flexibility, a platform / hybrid approach may be beneficial. Instead of a closed software solution, individual solutions can be assembled through building blocks. The use of libraries/building blocks can achieve a higher degree of standardization compared to a purely "make" solution. By leveraging pre-existing components, it becomes possible to build upon established standards and best practices, leading to more efficient and streamlined development processes. However, it should be noted that this approach requires a high level of expertise within the bank. There is no vendor that offers a finished product that only requires customization in certain areas. Instead, the bank itself is responsible for nearly all the business logic. Therefore, the question must also be answered as to whether this aligns with the bank's available resources and whether additional external parties can provide the necessary skills (which in turn creates dependencies and risks).

Target operating model
Based on the level of standardization, the optimal working mode between business departments and IT becomes an important question. This includes governance and practical considerations. Often, the perspectives of business and IT departments diverge in this regard. Business departments tend to prioritize the advantages of "open" systems. They aim to customize ALM software independently through e.g., scripting languages to enable swift and effective implementation of changes. Conversely, from an IT standpoint, it is crucial to maintain a minimum level of governance when implementing changes, and coding is (in some institutions) considered an IT responsibility. When modernizing the IT architecture, it is advisable to concurrently develop a target operating model (TOM). The TOM should allow for a clean software development process while minimizing significant barriers to achieving the anticipated momentum in further enhancing ALM functionalities.

Mentality and self-perception
This aspect touches upon several points already mentioned and goes beyond them. In our experience, it strongly influences the success of a system implementation. What is the bank's self-perception? Are there enough employees willing to and capable of significantly expanding a standard application or developing/operating their own platform (from a technical perspective) using programming languages? Can the bank standardize its business further and restrict certain business variations for the front office (and customers)? And furthermore: Is my organization regional or international? Do I require implementation and run-the-bank support in a specific language? Is an international help desk sufficient for my employees? Can complex matters be discussed with the vendor in English?

04. How we can help

d-fine is a European consultancy focusing on analytical, quantitative and technological endeavors. Together with our clients, we drive strategies, develop business designs and implement standard as well as tailored IT solutions.

It is crucial to emphasize that d-fine does not provide its own ALM software. Nevertheless, we have our own tools and specialized libraries that we can contribute as accelerators to your project. As a vendor-agnostic consultancy, we aim to assist our clients in finding the ideal solution that aligns with their specific requirements. This could involve implementing a standard ALM software or developing a customized platform solution. On the one hand, we have decades of experience in integrating leading commercial ALM solutions in the market. On the other hand, with a team of more than 1700 professionals, we have the capabilities to implement complex customized solutions as well.

With our team of over 200 ALM and banking specialists, we have expertise in various areas, including liquidity risk controlling, treasury management, financial controlling, regulatory reporting, and accounting. This comprehensive coverage enables us to provide support across the entirety of your IT landscape, facilitating the comprehensive renewal of your bank steering capabilities.

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