1 The History of ALM

Scribitur historia ad narrandum, non ad probandum. (Quintilien)

It is not possible to present ALM history without presenting Banking industry history even if it is possible to make a parallel with the Insurance industry.

This Part is an opportunity to present the links between ALM and the other types of business such as investment management, hedge funds and financial directions of corporate industries, etc.

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1.1 THE HISTORY OF THE BANKING INDUSTRY FROM ANTIQUITY TO THE MIDDLE AGES

1.1.1 Origins of banking

The origins of banking go back to antiquity. Historians discovered hints of banking activities dating from 3000 B.C. in Mesopotamia. The temples were places of trades and the priests used to take on the role of banker, taking money as deposits and lending money to the King or to the merchants. Temples were considered as the safest places where gold could be stored.

The first records of loans dating from the 18th century B.C. made by temple priests to merchants were discovered in Babylon.

Remember that in the Bible, Christ drives the moneychangers out of the temple . . .

In Ancient Greece, the temples conducted not only loans and deposits but also currency exchange and validation of coinage. Each Greek city was independent and minted its own money. Moneychangers appeared in order to develop trade between cities.

The letter of credit made its appearance: in return for a payment, a moneylender in one Greek city would write a credit note and the client would cash the note in another port. Thus, travel was less risky for the client.

In Ancient Rome, banking activities developed greatly and financial operations were established on a juridical basis. The idea of an interest rate on loans and on deposits was born.

1.1.2 The Middle Ages and the Renaissance

After the collapse of the Roman Empire in the late 5th century, monetary circulation slowed down drastically. Economic depression and deflation took place.

The influence of Christianity restricted banking activity: charging interest and usury were seen as immoral.

By the dawn of the 12th and 13th centuries, bankers were grouped into three distinct categories: the pawnbrokers, the moneychangers and the merchant bankers. The cathedral squares remained the centre of the money changers' activity.

At this time, work became a positive virtue: profits were supposed to come from the performance of a duty. The usurer was considered to be a person who earned money without working. The Church condemned usury; in the Third Lateran Council, usurers were excommunicated, usurers' offerings were forbidden as well as their inhumation in Christian ground. Yet, usurers remained in practice.

In the Middle Ages, each Lord or each independent city had the right to strike its own money. Moneychangers changed the money, charging a fixed fee for the transaction. This profession was respectable since it did not involve credit.

Pawnbrokers were considered to be deliberate public sinners, linked to prostitutes. It is at this period that the word "bank" from the Italian word "banca" appeared. "Banca" meant "bench": in the Middle Ages moneychangers or pawnbrokers used to practice their activities on wooden benches. The flat surface of the bench was necessary to display the wares of the lender or the borrower. Note that the term bankruptcy comes from the Italian term "banca rotta" which means that the "banca" has been broken.

At the beginning of the 11th century, the Lombards in Italy introduced new financial techniques and started a new era for the banking activity. The centres of operation were established in Italy: Florence, Genoa, Lucca, Venice and Rome were some of the city-states that gave birth to these banking activities.

That period saw the invention of the customer account: clients received a moderate interest rate on this account on which they could receive and make payments. The depositor was sometimes allowed to overdraw his account within certain limits.

Italian banks developed the letter of credit again; clients could buy a product in a city abroad and see the cash withdrawn on their principal account in their city of origin.

In these times, the notion of liquidity was introduced. The moneylender's business model was simple: lend at a high interest rate and borrow at a usury rate. To survive, banks had simply to ensure the appearance of liquidity and dependability to see the stability of the loans and of the deposits.

1.1.3 From the 17th century to the 20th century

Till the beginning of the 17th century and the invention of the paper check, the value of money was determined by its weight in gold, giving stability to the interest rates.

Trade centres moved to international ports such as Amsterdam or London. Banks started to take risk on the shipping industry: the ships associated with their letters of credit might sometimes not return from the place where they were supposed to carry the exotic goods back from (the voyage to India or America was very uncertain).

Central banks such as the Central Bank of England revolutionized the states' finances before becoming the Bank for the banks in each country.

Napoléon Bonaparte created the French Central Bank, "la Banque de France", on 18 January 1800.

The 19th century was the banks' golden age with the growth and stability of the system and the development of paper money and of scriptural money.

With the First World War, the United States with New York as the new world's leading financial centre became the major lender to the Allied Powers. This resulted in the large growth of the US economy.

After the First World War, the USA started to take a considerable place in the banking system.

1.1.4 The 1929 crisis

In 1929, the crash occurred followed by the "Great Depression". All over the world, markets collapsed and banks were accused of having caused the crash.

In American banking, the reaction was the creation of the Federal Deposit Insurance system and of the Glass–Steagall provisions to separate commercial banking and securities activities.

In the banking industry, from the crisis to the 60s, activity did not grow as fast as before: deposit and loan growth were weak while government influence on financial activity decisions grew faster.

1.2 THE MODERN BANKING INDUSTRY AND THE HISTORY OF ALM

1.2.1 The role of today's bank

Since the Renaissance, banks have been credit institutions providing various types of bank operations:

- receiving deposits;
- granting credits to individuals or corporations;
- providing cash management, means of payment (checks, ATM, credit cards . . .), currency money change;
- storing valuables in safe deposit boxes;
- providing fortune management and financial investment consulting . . .

Banks are the service industry for money, a safe place to deposit money at a moderate interest rate. In banks, we can borrow money so we do not have to wait to make an investment project come true.

Banking activity requires a licence commonly issued by the local bank regulatory authority. This licence gives the right to issue loans and collect deposits. Some financial institutions may provide banking services and are called non-banking financial companies.

The Central Banks of the 18th and 19th century have kept the same role as yesterday: they often control interest rates, inflation rates and money supply. In the case of a liquidity crisis, they may act as "lender of last resort".

An Interbank market has developed to ensure the liquidity of the market: a bank with too many assets may ask other banks for money.

Banking books include reserves and a minimum capital requirement to allow the bank to repay debtors and depositors in case of potential bankruptcy. Basel Committee regulation is the international standard for the calculation of the capital requirements.

Bank profits arise from the fees on financial services and on the difference between the lending rate and the borrowing rate. The overall banking objective is to make profitability on a long-term horizon within the banking system as stable as possible. In fact, the role of regulation is to provide this stability but we will see in this book that his role is also given to ALM.

1.2.2 Types of bank

Nowadays, the banking system recognizes two major types of bank: retail banks and investment banks. It is common to split universal banks between these two different departments: retail and investment banking. In financial service companies, we may find other service types: leasing, factoring, security services and even insurance (in Europe mainly with the "bank-insurance" companies), etc.

Considering retail banking, the customers are individuals or SMEs (small and medium businesses or enterprises).

We may find different types of retail banks: postal saving banks (associated with the national post in the US, in France, etc.), private banks (for wealthy individuals), community development banks (for isolated populations), ethical banks (only investing in socially responsible assets), and mutual bank companies (where shareholders are the customers).

Savings banks are retail banks that took their roots in the 19th century, with the objective of providing saving products to all the categories of savers and usually with a large distribution network.

As for investment banking, the customers are corporations or large businesses willing to act directly with the financial markets. The investment bank may trade for its own accounts but its main activity is to advise corporations on capital markets and to sell financial products to these corporations. Corporations may need advice from investment banks for their mergers and acquisitions, for their financial risk management hedging and for their capital structure refinancing.

The commercial banks are a type of retail bank in the USA that deals with deposits and loans from corporations but not with the capital markets.

1.2.3 The American banking crisis of the 1980s and the necessity of regulation and the implementation of ALM

From 1929 till the mid 60s, the interest rates did not move a lot: bankers used to play according to the 3-6-3 rule: taking deposits at a 3 % rate, lend at 6 % rate and go to play golf at 3 o'clock.

In fact, however, banks are susceptible to many forms of risk: liquidity risk, credit risk, interest rate risk, etc. When a risky scenario becomes true, a banking crisis may follow. Since 1929, prominent examples include the US Savings and Loan crisis in the 80s and early 90s, the Japanese banking crisis during the 90s, etc.

The following figure shows the number of Bank Failures in the United States from 1934 to 1995.

1.2.3.1 The Savings and Loans (S&L) insolvencies

The historically high interest rates between 1980 and 1982 caused insolvencies in the S&L industry.

In 1980, the total assets of S&Ls insured by FSLIC (Federal Savings and Loans Insurance Company) were $ 604 billion. The vast majority of these assets were held in traditional S&L mortgage-related investments. Because of an asset/liability mismatch with a steep ascent of interest rates, net S&L income went down from $ 781 million to negative $ 4.6 billion and $ 4.1 billion in 1981 and 1982.

From 1980 to 1982, 118 S&Ls with $ 43 billion in assets failed, costing the FSLIC an estimated $ 3.5 billion. There were also 493 voluntary mergers and 259 supervisory mergers of S&L institutions.

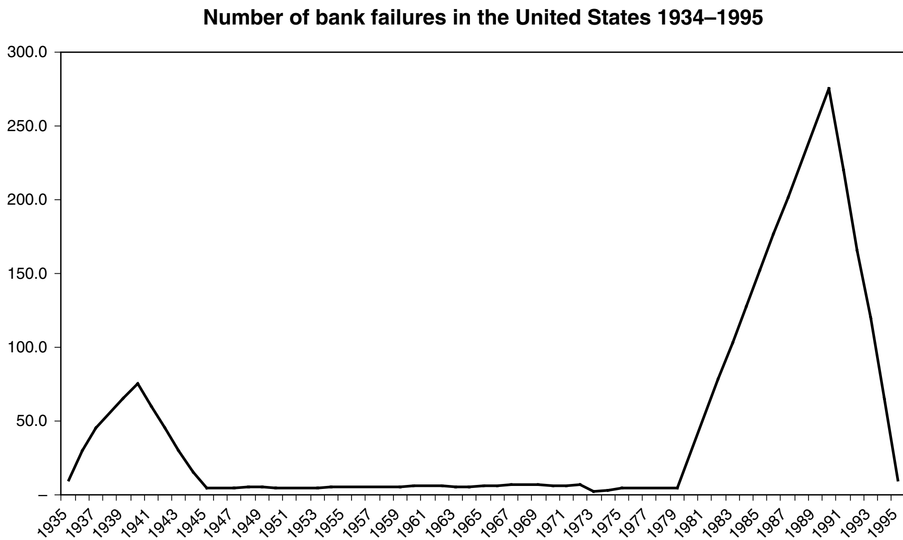

Figure 1.1 Number of bank failures in the United States

The first lesson of the S&L crisis was a regulatory lesson: a need for a qualified, strong, and effective supervision independent from industry with adequate financial resources.

The second lesson of this crisis was the need for indicators to monitor the mismatch risk between assets and liabilities: ALM was born.

1.2.3.2 The real estate crisis

Shortly after, at the end of the 80s, another financial crisis arose with the real estate crisis. Commercial construction activity boomed at the beginning of the 80s due to a large demand for real estate investment. This boom was followed by banks that started to lend within an atmosphere of strong concurrence. Total real estate loans of banks more than tripled. Credit risk taken by banks was very important since the loan-to-values were often close to 100 % and the constraints imposed on customers were weak.

The real estate bubble burst in the late 80s and real estate values collapsed. Loan quality deteriorated and this deterioration caused many banks to fail, especially banks involved in commercial real estate lending.

This crisis was caused by weak credit risk modelling in balance sheet. The Basel regulation framework was a result of this crisis experience.

Consequently, risk management teams and especially credit risk teams found their place in banks' organizations.

1.3 THE HISTORY OF THE INSURANCE INDUSTRY AND ALM

1.3.1 The history of insurance

The will to protect ourselves from the hazards of life is as ancient as human society and leads to the early appearance of the solidarity organization.

The first risk transfer experiences belong to the Chinese and Babylonians (3rd and 2nd Millennia B.C.). At this time, travel was uncertain and the risk of losing wages was important: by paying a premium, insurance on ship wages could be settled easily.

The Greeks and the Romans invented health and life insurance: "benevolent societies" cared for families exposed to a member's death. Similar "friendly societies" or in the Middle Ages "Guilds" existed in Europe till the late 17th century.

Modern insurance was invented at the same time (14th century) and in the same place (Italy) where modern banking was created. New insurance contracts that are still used for the shipping industry separated insurance from investment.

Marine insurance, as with the banking industry, moved north during the 17th century. London became the world insurance headquarters with companies that still exist today, such as Lloyd's. Organized forms of insurance based on a mathematical risk approach came into being at this time.

After the Great fire of London, English insurers invented fire insurance and exported it to many countries including the USA.

During the 18th and 19th centuries, with mechanization and industrialization, the number of accidents increased. With new risks and with an urbanized population, insurance found new areas in which to develop.

In the 20th century, it became an obligation to be insured, with new insurance types such as health insurance, work insurance, etc. Contracting for insurance became common practice after World War II.

In the 70s, with inflationist pressures, individuals started to invest in highly remunerated assets, sometimes using their life insurance as a pledge. In life insurance contracts, many options are sold implicitly to the client. However, it is only at the end of the 70s that insurers began to worry about the risk related to these options.

Options may be of different types:

- option of repayment (right to choose between rent and capital);
- pledge optionality (the client may borrow money on the basis of the market value of his life insurance contracts);
- early prepayment of contracts;
- renewal option (option to extend the term of the contract with its initial terms);
- extra-deposit option (right to invest more than the contractual investment at the initial terms) . . .

A poor understanding of the options sold implicitly caused the insolvency of some insurance companies: First Capital Holdings and First Executive Corporation in 1991, Baldwin-United in 1983, insurance companies with at least $10 billions of Assets.

1.3.2 Today's insurance industry

Nowadays, insurance is the simplest way to protect against the risk of some uncertain financial losses. Providing this protection against a predictable but significant risk, the insurer charges a premium proportional to the risk.

The risk cannot be an extreme risk in order to provide sufficient solvency for the insurer. Even if insurers may use reinsurance to insure themselves against their extreme risks, customers are protected from insurers' insolvency by systems of Guaranty Funds.

The insurance company's income comes from the premiums and the investment income. Expenses are linked with the incurred losses and the underwriting expenses.

Thus, on the one hand, to become profitable, insurance companies have to calculate the premiums as precisely as possible and to do so they use the actuarial science. Historical databases are used by actuaries to compute the probability and the average cost of the risk arising.

Pricing the premiums should also take into account "anti-selection": customers willing to take insurance are sometimes more exposed to the risk than customers that have the same characteristics in the historical database.

On the other hand, to get profitability, investing the premiums adequately in financial markets is necessary: the premiums are collected before the payment of the claims.

Today's insurance markets are centralized and regulated internationally but the regulation depends on the country. International regulation is derived from the Solvency II regulation framework.

1.3.3 Types of insurance and insurance companies

Among the different types of insurance, we may find auto insurance, health insurance (covering medical bills), liability insurance (for example legal defence in the event of a lawsuit, etc.), casualty insurance (against accidents) or life insurance (providing a sum of money to a family in case of the subscriber's death).

Other types of insurance may be annuities (protecting the retiree from the risk of outliving his financial resources), disability insurance, credit insurance (protecting the bank against the risk of death of the borrower, for example) or environmental liability insurance . . .

Property insurance protects against fire, weather or theft.

We split insurance companies between three types: life insurance companies (providing life insurance, annuities and pension products), non-life insurance companies and reinsurance companies (highly capitalized companies providing insurance to insurers).

The attractiveness of life insurance products is often due to local tax law regulation: the interest is not taxable under certain circumstances (for example in the UK, in the USA, in France, etc.).

"Producers" usually propose the contracts and "brokers" sell them to the clients. The "brokers" work for many "producers" or directly through the producer's network.

1.4 THE HISTORY OF OTHER BUSINESSES AND ALM

1.4.1 Investment management

Investment management is the management of assets, securities and other various types of investments to meet the objectives of a client (private investor, private banker for the account of their client or institution such as insurance company, pension fund, corporation, etc.).

The investments are usually "mutual funds" managed by a "fund manager". The typical organization is close to the corporate investment bank organization with: research, sales, marketing, middle and back offices, internal audit, controllers, etc.

The relationship between the client and the investment management company is based on the 3 P's rule: Philosophy, Process and People. The investment company fund manager usually works with a Philosophy that has to be explained to the client. Among the possible Philosophies, we may find different types of investment styles:

- "growth" (when deciding to buy stock companies with potentially rapidly growing earnings);
- "value" (when buying stock companies with long-term return);
- market neutral;
- small capitalization, etc.

After having chosen the Philosophy, the Process (i.e. the way the Manager implements the Philosophy) and the People (i.e. the persons that follow the process) there come the other investor's success keys.

Quite often, investment managers work with a benchmark. This benchmark is, for example, the index composed of the proportion of stocks, the proportion of bonds and the proportion of monetary items the client wants his investment's return to look like. A client willing to invest in "aggressive" funds will see his part of stock, for example, around 60 %, bonds around 30 % and monetary items around 10 %. In a "well-balanced" strategy or a prudent strategy, the stock and bond proportion decreases and sometimes goes to zero.

With this benchmark, the asset manager's job is to find the best "asset allocation" with the help of his research teams. The objective is to outperform the peer group of the competing investment funds of the same category (usually working with the same benchmark).

Investment management regulation depends on the country (in the USA, SEC regulates the profession).

Investment Management is a very old ALM problem. Theories about asset allocation go back to the Markowitz Theory (or CAPM). With very simple liabilities (due to the existence of a benchmark), the manager's objective function is to optimize the absolute or the relative performance (compared to the benchmark) of the fund. Markowitz theory invites to use a diversified portfolio in order to benefit from the correlation of the assets.

All this theory is based on the long-term return of the assets. However, the fund accounting is marked-to-market based (the fund "net asset value" is calculated every day or every month): ALM through asset allocation should take into account the risk of underperformance of the funds directly affecting the business revenue (but not the costs, etc.).

1.4.2 Hedge funds

Hedge funds are a new special type of investment fund using unconventional strategies with sometimes a low level of regulation.

Alfred Winslow Jones created the first hedge fund in 1949; his strategy was to sell short stocks and buy others: doing so, a part of the risk present in the fund was "hedged". Many hedge funds still use the long/short strategy but they extend it to the other markets (the bond market, for example).

The main hedge funds strategies include:

- long/short strategy;
- options/derivatives strategy;
- spread arbitrage;
- merger arbitrage (when buying a stock company implied in a merger or acquisition programme, betting on the result of the operation on the stock value);
- event driven strategies;
- global convertible bond arbitrage;

- global macro;
- commodity trading;
- statistical arbitrage, etc.

Another type of hedge funds is the *"fund of funds"* where the hedge fund manager invests in different investments or hedge funds and makes arbitrages among them.

The revenue of the fund management is often a proportion of the amount of assets under management plus a percentage of the fund's net profit. The hedge fund market used to be criticized for its large margins and its weak profitability.

Hedge funds are supposed to have a low risk since the strategies they use contain risk diversification. In fact, however, managers often use what we call the "leverage effect": their strategies use very little cash in order to take strong positions in one risk. For example, when we buy a call option, we get high returns when stocks go up after having paid a very modest premium.

As a conclusion, the extreme risk taken by the manager is important: when tracing the profitability distribution of hedge funds, the graphic often contains a large distribution tail.

Because hedge funds use the same types of strategies, the market is correlated and a systemic risk arises: in unanticipated extreme scenarios, catastrophic losses may occur.

In fact, hedge fund regulation is a major question: a question of methodology (how to regulate such an activity) and a question of regulator training in order to understand this market.

The *failure of Long-Term Capital Management (LTCM)* in 1998 is a good example of what ALM intervention could be in hedge fund management. In 1973, Black, Scholes and Merton developed their famous formula that links the derivative product price with the hedging strategy price. (Two of them received the Nobel Prize for this revolutionary theory in 1997.) Even if they were active members of the hedge fund LTCM, they could not prevent the fund's failure. The fund used the leverage effect on derivatives: it invested a lot of money in order to pay options premiums.

The LTCM example highlights not only the hedge fund systemic risk and the necessity of regulation but also the need for an operational risk management in hedge funds.