

Derivatives: an insurer's perspective

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The business model of insurance companies and their role in the economy and for policy holders make the use of derivatives key instruments to manage their risks. Insurers bear some specificity compared to other markets' participants in derivatives markets: their purpose is mostly hedging and, structurally, insurance companies do not take leveraged positions. Derivative instruments are a reality for an insurer like AXA as evidenced by figures and processes in place ; and Solvency II will most likely increase derivative hedging. Throughout the crisis, management of derivatives revealed significant improvement needs. But derivatives passed the test. Of course, there is a need for better regulation and insurers' support many ongoing initiatives. However, OTC contracts play an instrumental role for insurers and their role and importance should be acknowledged.

The business model of insurance companies and their role in the economy and for policy holders make the use of derivatives key instruments to manage their risks. However, insurers bear some specificity compared to other market participants in derivatives markets: their purpose is mostly hedging or increasing investment strategies efficiency and, structurally, insurance companies do not take leveraged positions. For an insurer like AXA, the use of derivative instruments is a reality. And Solvency II will most likely increase even more the use of derivatives for hedging purposes. Throughout the financial crisis, derivatives management revealed significant improvement needs. But derivatives ultimately passed the test. Of course, there is a need for better regulation and insurers support many ongoing initiatives. Listed derivatives as well as over-the-counter (OTC) contracts play an instrumental role for insurers and their role and importance should be preserved.

1 | RISK MANAGEMENT IS CONSUBSTANTIAL TO INSURERS' BUSINESS

Risk management is at the core of insurers' business. They accept risks on one hand, and they manage them on the other. And normally, these activities are performed to set up a win-win and profitable relationship for the policyholder and the shareholder. To do so, an insurer pools the risks it bears by writing insurance on large numbers of policyholders, whose risks of loss are more or less statistically independent. Also it can diversify most of this risk (i.e. to offset the probability of loss) by aggregating low correlated risks within a line of business, or/and between lines of business, or/and between risk categories, but also between legal entities and between countries. One of the well-known examples of diversification effect between risks is given by the case of mortality and longevity risk in life underwriting.

However, risk pooling and diversification only mitigate but do not eliminate underwriting risk. And even if the role of insurance companies is to bear risk, this requires capital which is both costly and scarce. As a result, there must be for each company a deliberate decision from the management about

which level of risk to bear. This conscious decision induces a need to transfer part of the extra risk externally.

Hence, insurers use risk transfer and mitigation techniques. One of them is traditional reinsurance by contracting with a reinsurer. For many companies this is still today the predominant means. For traditional insurance risks (longevity, natural catastrophes, deviation of reserves...) this is still the most readily available option. Another technique is securitisation. This is financially equivalent to a basic reinsurance mechanism where investors play the role of the reinsurer. Insurance-linked securitisation is a quite new market which started successfully its development with the securitisation of natural catastrophes exposures ("cat bonds") but struggled to develop on other underlying risks despite a few tentatives. As an issuer, AXA has been a pioneer on such instruments. Another option is to have recourse to derivatives. This is the most common technique for financial risks.

Insurance companies conduct a business that lives through different phases. First, they underwrite risks by issuing insurance policies, based on an assessment of the risks (e.g. property, casualty, health, death, longevity, investment, etc.) and the exposures of potential clients. When the insurer accepts the risk, the policy is priced according to the coverage that is granted to the client, who pays a premium to the company. Then, they invest the premium so that funds are available to pay claims on a timely basis.

From a financial perspective, insurers perform an intermediary function. The policies that property-casualty or health companies sell generate technical liabilities funded by the premium flow. Life insurers collect premiums and savings by issuing various types of products (cash value life insurance, annuities, and guaranteed investment contracts). The premiums are invested primarily in traded bonds (both sovereign and corporate), equities, and real estate.

This intermediate function gives rise to the need for asset liability management (ALM), because the cash flows of the liabilities issued by insurers have different patterns and characteristics than the cash flows of the assets they invest in. These ALM techniques match *inter alia* duration, currency and liquidity on both sides of the balance sheet.

An appropriate and skilful asset liability management will provide a given insurer with a competitive advantage. Indeed, it will allow him to create an asset portfolio which delivers the promised policy cash flows responding to the specific needs of particular policyholders while optimising the return of its portfolio without exposing either policy holders or shareholders to unacceptable levels of risk.

Central to asset-liability management are the management of the duration and the convexity of both assets and liabilities and currency matching.

2| DERIVATIVES ARE ESSENTIAL INSTRUMENTS FOR INSURERS TO HEDGE THEIR RISKS

Derivatives are a fundamental element of any insurer’s risk management toolbox. For the most part, indeed, insurers use derivatives for hedging. They have to hedge various risks stemming from both sides of the balance sheet: interest rate, foreign exchange, credit, equity, inflation, volatility, longevity (even if the last is far from being a deep and liquid market).

The simplest way to manage duration and convexity is to match asset and liability cash flows or to structure asset portfolios so that the durations of assets and liabilities are matched (“portfolio immunisation”). When done only with physical assets (mainly bonds), this has one major drawback: tailor-made and dynamic matching is impossible because the maturities of the available and most liquid bonds do not match the moving pattern of cash flows and thus it involves a lot of trading. Derivatives provide a cheaper and/or more flexible way to manage duration and convexity risk through the purchase and/or the sale of various combinations of derivative contracts, such as swaps, calls and puts. But it may have unintended accounting consequences (see below).

Derivative strategies are indeed usually both more flexible and quicker, sometimes even less costly, to implement than trading physical assets. They allow reshaping the ALM profile more accurately because they allow customised solutions (e.g. hedge of tail events, mitigation of long maturity risks, coping with non-linear behaviours...).

Derivatives are sometimes used as well as an alternative way to gain exposure to certain asset classes through «synthetic positions», such as for example, holding cash and equity futures instead of physical equities. Another example is the recourse to government bonds and credit default swaps (CDSs) as a synthetic position and an alternative to the direct purchase of a corporate bond. The counterparty risk is the same but the liquidity is much higher and an excess return can be captured for the same risk level. Besides, the use of derivatives allows for an optimisation of the yield through moderate investment in more risky investments, while not jeopardising the key ALM objective.

The changes in the market as well as the regulatory environment have led insurers to explore new techniques for managing their asset and liability risk. Thanks to the rapid growth of financial derivatives market over the past decades, there is today a wide variety of contracts to manage many types of financial exposures. The contracts range from standardised derivatives that are traded on organised exchanges to individually tailored, OTC contracts.

3| INSURERS BEAR SOME SPECIFICITY COMPARED TO OTHER MARKETS’ PARTICIPANTS

First, as underlined before, the purpose of an insurer who has recourse to derivatives is mostly hedging; derivatives can also be used for return enhancement as it provides synthetic exposure to certain asset classes; derivatives are not used for short term speculation.

Second, structurally, insurance companies do not take leveraged positions in this context, unlike other investors such as banks or hedge funds. Indeed, they don’t need leverage because liquidity is not such an issue as they receive premiums before paying claims. In most companies, internal risk management guidelines prohibit leverage. Besides, most local or regional jurisdictions do not allow leverage, either explicitly or as a consequence of an overarching principle according to which, to support insurance liabilities, they require assets which exhibit sufficient strength, liquidity and matching. Asset liability management in large insurance

companies has been looking at financial risks from an economic perspective, encompassing off balance sheet commitments for a number of years now. The risk tolerance and appetite in most insurance companies would not allow any leveraged position. Finally, for European Union companies, Solvency II (see below) will force a risk based approach to the solvency requirements of insurance companies. Under Solvency II, any leveraged position would automatically require an unbearable level of capital. This is crucial to bear in mind when it comes to the design of new regulation of those markets and to the different participants.

4 | DERIVATIVE INSTRUMENTS FOR AN INSURER LIKE AXA: FIGURES AND PROCESSES

Economic hedging strategies are defined and managed by AXA's local operations. Such economic

hedging strategies include (i) managing interest-rate exposures on fixed maturity investments, long-term debt and guaranteed interest rates on insurance contracts, (ii) managing foreign-currency exposures on foreign-currency denominated investments and liabilities, and (iii) managing liquidity positions (including the ability to pay benefits and claims when due) in connection with asset-liability management and local regulatory requirements for insurance and banking operations, (iv) limiting credit risk with regard to certain investments in corporate debt instruments and (v) managing equity and inflation risk. Derivatives have also enabled, when liquidity was available, to mitigate the Real Estate risk.

As at end 2009, the notional amount of all derivative instruments for the group totaled EUR 308 billion.

While the notional amount is the most commonly used measure of volume in the derivatives market, it is not used as a measure of risk because the notional amount greatly exceeds the possible credit and market loss that could arise from such transactions.

Box 1

How does AXA manage risks in derivatives?

In terms of **governance**, derivative strategies are systematically reviewed and validated by local ALM committees in the same way as any other ALM or investment strategies.

The **market risk** arising from derivatives is regularly monitored in multiple processes: (i) risk appetite process, in which the market risk position is continuously monitored, separating the impact of physical investments and derivatives; (ii) Solvency II process, in which the sensitivity of AXA to financial risk factors is monitored, also separating the impact of physical investments and derivatives; (iii) this monitoring ensures that there is **no leverage** arising from derivatives.

Legal risk is addressed by defining a standardised master agreement which AXA business units must use to trade derivatives. This standardised agreement ensures that AXA's policy is consistent across the AXA Group and that all business units experience an appropriate level of legal protection when trading derivatives.

There is a centralised **counterparty risk** policy. Group Risk Management has established Group-wide rules on authorised counterparties, minimum requirements regarding collateral, counterparty exposure limits. In particular, our **collateral process** allows reducing the credit risk arising from OTC derivatives at a limited level compared to the total value of derivatives in position.

The **operational risk** related to derivatives is measured and managed in the context of AXA's global operational risk framework. Furthermore, four centres of expertise have been selected to centralise execution of derivatives and reduce operational risk.

The **valuations** are also a key element of the Derivatives Management. AXA entities rely on the Derivatives Platforms of the Group (located in AXA IM and Alliance Bernstein) to independently counter-valuate the derivatives positions so as to get comfort on the accounting but as well on the prices proposed by counterparties in case the AXA entity wished to early terminate or restructure the derivatives. This pricing capability requires deep technical knowledge which has to stay updated and to follow market developments for new derivatives instruments usage.

The AXA Group is exposed to credit risk in respect of its counterparties to the derivative instruments, but is not exposed to credit risk on the entire notional amounts. AXA actively manages counterparty risk generated by OTC derivatives through a specific Group-wide policy. This policy includes a limit framework and an exposure monitoring process. Limits are set specifically for each authorised counterparty, based on an internal scoring system. This policy also includes daily to weekly collateralisation for the majority of the Group's exposure. Appropriate collateralisation reduces counterparty risk to very small amounts.

As at end 2009 and based on notional amounts, (i) 48% of the derivative instruments used consisted in swap contracts, (ii) 27% were option products, mainly caps, floors and swaptions, (iii) 15% were futures and forwards, mainly other than foreign currency products, and (iv) 10% were credit derivatives. Credit derivatives are mainly used as an alternative to corporate debt security portfolios, when coupled with government debt instruments, but also as a protection on single corporate names or specific portfolios. In 2009, the Group bought EUR 4.4 billion in CDS protection used for negative basis trades. This strategy consisted in purchasing (i) corporate debt instruments and (ii) CDS on the same issuer, maturity and seniority so as to lock associated liquidity premium.

- **Swaps:** AXA primarily uses (i) interest-rate swap contracts to manage cash flows arising from interest received or paid, and (ii) cross-currency swap contracts to manage foreign-currency denominated cash flows or investments. At end 2009, interest-rate swaps accounted for 65% of all swaps used by AXA. Currency swaps constitute another part of AXA's hedging strategies to manage foreign currency cash flow exposures. Equity swaps can also be used to hedge single equities exposure.

- **Options:** the option portfolio consists mainly of caps and floors and swaptions. Interest rate caps and floors are options agreements where the seller agrees to pay the counterparty an amount equal to the difference, based on a notional amount, between the interest rate of the specified index and the interest rate cap or floor. These products are used to hedge against interest rate increases (caps) or decreases (floor). Caps and floors are used predominantly in

some entities Life & Savings operations to protect their ability to serve policyholder participation and credited rate mainly for general account products with guaranteed minimum rates of return. They are used as well to anticipate the change in lapses and surrenders when interest rates move. Some customers tend to lapse when interest rates increase in order to reinvest into new products with higher guarantees. Conversely, surrenders tend to reduce when interest rates drop as the guarantees get more value for the customer. This induces a convexity of our interest rate exposure which is captured through our dynamic lapse assumptions and that such options help to match. The notional amount of caps and floors at end 2009 was EUR 44 billion or 53% of the total notional amount of all options. Swaptions represented 18% (EUR 15,082 million notional at end 2009) of the total notional amount of options as at end 2009.

- **Futures and forwards:** on a consolidated basis, the notional amount of futures and forwards at end 2009 was EUR 45 billion. Currency future and forward contracts accounted for 70% of these instruments.

- **Credit derivatives:** AXA, as part of its investment and credit risk management activities, may use strategies that involve credit derivatives (CDSs), which are mainly used as an alternative to corporate debt instruments portfolios, when coupled with government debt, instruments, but also as a protection on single corporate names or specific portfolios. At end 2009, the notional amount of credit derivatives carried by the Group was EUR 32 billion (including EUR 7.5 billion held through CDOs).

- **Mortality derivatives:** on November 13, 2006, AXA announced a EUR 1 billion pluri-annual shelf program to transfer mortality risk to the capital markets, of which approximately EUR 345 million (converted at the transaction date) was invested in 2006. This risk transfer was a securitisation of over-mortality risk in three countries in which AXA operates and resulted in a derivative contract between AXA and a special purpose vehicle named Osiris Capital plc. The securitisation and the attached derivative were redeemed on January 15, 2010.

In all cases, derivatives are strictly limited and monitored to avoid any leverage.

5 | THE USE OF DERIVATIVES WITHIN SOLVENCY II

Solvency II is the new solvency regime that will apply to all European Union insurers (pension funds are outside of the scope), normally by 2013. It provides for an economic risk based assessment of the Solvency Capital Requirement (SCR). It uses transparent and cutting edge actuarial methodology. More specifically, with regard to risk and asset liability management, Solvency II rewards economic diversification between lines of business, geographical regions and recognises new risk transfer and mitigation techniques like securitisation, reinsurance pooling, and hedging programs.

One can understand why Solvency II will encourage insurers to better manage and mitigate financial risk via actual reduction (divestment), dynamic hedging and also static hedging, using derivatives.

For risks with no evident risk premium, one can expect to observe strong reductions or dynamic hedges. These risks typically comprise interest rate risk, foreign exchange, realised volatility, where insurers will tend to match their liabilities. In particular, reducing implied volatility risk means hedging the options and guarantees embedded in insurance liabilities, which will be new for most of insurance companies.

However, for risky assets which can demonstrate an expected risk premium, insurers will at least want to hedge tail risk including with the use of derivatives. For equity, one can expect actual reduction or implementation of static hedges (e.g. out of the money – OTM puts). For alternatives, one can expect divestment or dynamic strategies (e.g. constant proportion portfolio insurance – CPPI)

Overall, we can expect an increase in derivative hedging. Some customised low capital strategies based on derivatives also emerge to capture tactical opportunities linked to the liquidity premium monetisation (e.g. negative basis trades).

A major challenge for insurers will be to implement all these strategies while minimising IFRS profit and loss (P&L) volatility. Currently, the notion of hedge accounting within the IAS 39 framework applies to

a very small portion only of the derivatives used by the insurers. Changes in hedged underlying assets valued at fair value through other comprehensive income (OCI, available-for-sale (AFS) category) are not offset by changes in derivatives valued at fair value through P&L. Changes would be offset by natural hedge only if assets and liabilities were valued at fair value through P&L.

With Solvency II, which values all assets and liabilities at fair value, there is no need for specific hedge accounting. Indeed, all changes in fair value of underlying hedged items will be covered by natural hedges.

IFRS 4 phase II will also allow for natural hedging because all assets and liabilities are valued at fair value through P&L. However, to avoid too high volatility in the measurement of performance, it would be timely to keep the possibility to book changes through OCI and recycle loss or gain through P&L when realised. The upcoming application of IFRS9 with a broader use of cost for debt instruments requires a revision of hedge accounting provisions.

6 | THE CRISES EVIDENCED THE NEED FOR DERIVATIVE INSTRUMENTS

Management of derivatives revealed significant improvement needs. But derivatives passed the crisis test. Indeed, Lehman Brothers was a major participant in derivatives markets. Its excessive leverage and failing risk management partly explained its collapse. However, Lehman's default prompted massive terminations of transactions and massive replacement trades implementations (renewals of transactions that had disappeared), without major disruption.

When traded on liquid markets or when robust secondary market clauses have been negotiated, derivatives can be managed in a sound way, as they do not add any counterparty credit risk thanks to several mechanisms: collateralisation with a low threshold, systematic margin calls, standardised and robust documentation (International swaps and derivatives association – ISDA, credit support annex – CSA...). Besides, it does not necessitate any liquidity other than to pay margin calls.

For these reasons, one should resist the temptation of demonising derivatives. They are necessary in a world where accounting is based on mark-to-market and regulation on limits to value-at-risk. They provide a certain level of security. There is clearly room for improvements though, as evidenced by the crisis.

7 | THE CRISIS ALSO REVEALED THE NEED FOR BETTER REGULATION

The list of mismanaged derivatives with huge consequences is long: Barings, AIG, Orange county... Any regulation should ensure both financial stability and level playing field, notably with a comprehensive and consistent coverage to avoid regulatory arbitrage strategies that have very dire consequences.

Solvency II provides a good regime even if it does not have a comprehensive scope (e.g. pension funds are outside the scope). It sets up an economic approach of risks; it is market-consistent based. It is a useful tool to detect ill-advised practices such as leverage and speculation. However, any effective regulation cannot apply to one category of market participants and/or one region only.

As a user, we support the initiatives that aim at making derivatives safer, while fully recognising that credit default swaps, interest rate swaps, foreign exchange, equities and commodities derivative markets are very different in nature and design and that different approaches are required for each asset class.

Key for the success of any reform will be the close coordination among authorities over the globe to ensure similar appropriate regulatory requirements, harmonise reporting and data requirements, set global standards for domestic infrastructure solutions to global markets.

In the aftermath of the crisis, a lot of thinking has been given to market infrastructures improvements and proposals have been publicly put forward. In particular, central counterparties (CCPs) are being put forth as the way to make OTC derivatives markets safer and sounder, and to help mitigate, if not suppress, systemic risk.

Indeed, if soundly run and properly regulated, CCPs can reduce the counterparty risk among OTC derivatives market participants. It can also net transactions across multiple counterparties. Finally, it can ensure that payments to others occur when a

Box 2

Some examples of welcome improvement measures of the OTC market infrastructure

Beyond CCPs, OTC market infrastructure can be improved on several grounds:

Interest rate swaps: extend the scope of products cleared in terms of currencies included and maturity, basis trades and cross-currency trades; extend direct participation in Swap Clear consistent with stringent membership criteria to ensure robustness in member default; offer clearing services to clients of General Clearing members; continue to expand the use of electronic confirmation; build out a trade repository, equally accessible by regulators globally;

Foreign exchange: broaden continuous linked settlement (CLS) uptake by expanding the set of currencies covered, the range of participants that can connect to it; and expanding the settlement cycle;

Equities: encourage legal uniformity of standard contractual documentation across EU countries; encourage consistent treatment of corporate actions by different European exchanges; increase electronic confirmation; strengthening bilateral clearing arrangements;

Credit default swaps: extend the scope of products cleared; extend direct participation in CCPs; offer clearing services to clients of General Clearing members; encourage trade date matching and reduce manual confirmations; increase use of central settlement; novation consent achieving legal confirmation.

counterparty defaults. Nevertheless, it concentrates the counterparty and operational risk associated with the CCP itself. This will therefore require top risk management practices from existing CCPs, coordination among regulators and supervisors on a global basis. Finally, contingency plans should also be coordinated to ensure that the financial failure of a CCP does not lead to systemic disruptions in associated markets. All in all, these initiatives are very much welcome as they should help facilitate credit risk management and reduce systemic risk, but current proposals are not perfect, notably the fact that each type of derivative would be treated separately.

Clearing initiatives in the industry are currently being contemplated, in credit default swaps, interest rate swaps, equity derivatives and foreign exchange.

However, it is worth bearing in mind that sound derivatives markets do not only need better regulation. They also need to be deep and liquid with notably an active competition among banks, which are the main providers for liquidity in those markets. Liquidity and depth of the markets are necessary for end investors as insurance companies; it is therefore necessary that the new contemplated regulations for banks allow them to play their role on those markets with reasonable capital requirements. From this point of view, better regulations of derivatives markets will allow banks as well as end investors like insurance companies to better limit and monitor their risks.

8 | OTC CONTRACTS STILL PLAY AN INSTRUMENTAL ROLE FOR INSURERS

Although there is a clear need to promote more organised, central clearing, over-the-counter trading is necessary, as a complement to exchange trading.

Notably, insurance companies need to manage asset liability matching in a context where there is a wide variety of liabilities. By their very purpose, standardised and exchange traded derivative instruments can be useful only to a certain extent.

For instance, to hedge the risk arising from guaranteed interest rates or guaranteed surrenders requires customised exposure profiles with specific maturities or strike levels. It is very unlikely, not to say unrealistic, to envisage that such tailor made transactions could be traded on an organised market, where liquidity cannot be offered for all existing exposure profiles.

More broadly, reduced – or even no – liquidity on customised contracts is the main obstacle to trading only. It is for example typical for specific risks which are not often traded such as inflation or real estate. In such case, even if an exchange is organised around a range of "standardised" instruments, due to the low volumes, the bid-ask spread is too high to create an actual market.

Derivatives, while not new, have been one of the key innovations in the financial markets over the past few decades. Financial innovation, like any innovation be it in business or elsewhere, is an ongoing process. It reacts to changes, it aims at addressing existing and emerging needs in a new way, it ebbs and flows, it booms activities and sometimes it busts. However, we should bear in mind that, as Joseph A. Schumpeter wrote it more than 70 years ago, "innovation is the outstanding fact in the economic history" and "nothing can be more plain or even more trite common sense than the proposition that innovation...is at the center of practically all the phenomena, difficulties, and problems of economic life".¹ In that sense, financial stability is also about striking the right balance in the design of regulation between preventing reckless behaviours and satisfying the ultimate needs of the individuals. For an insurer, our interest in financial innovation, notably in derivatives, includes setting up the apparatus that will enable us to provide our clients with products and tools to give them this long-term perspective to invest, save and consume, which are ultimately the basic ingredients for growth.

¹ "Business Cycles", New York: McGraw-Hill, 87.