

PART
One

Overview of Customer-driven Derivative Business

The derivative business environment has evolved and changed dramatically. Many lessons have been learned, and financial regulations have become more sophisticated and demanding. Product offerings bearing geographic features reflect the importance of the customer-driven derivative business. In order to cope with the evolving business environment and optimize business efficiency and safety, executives need to create an effective organizational structure, streamline the development process for new products and modernize product distribution techniques.

Financial risk management and the banking global rule book Basel III are the generic parts of the business. Executives must manage economic and regulatory capital requirements along with leverage and liquidity, all of which attribute significantly to the business's bottom line.

Evolving Derivative Business Environment

The derivatives business has evolved in terms of customer needs, product ranges and models and infrastructure required for managing the derivatives products. It is a business that requires comprehensive understanding of the quantitative and organizational setup, and one must pay attention to the overall picture, as well as individual components.

CUSTOMER-DRIVEN DERIVATIVE PRODUCT CATEGORIES

Derivative products are explicitly or implicitly embedded in many financial product types:

- retail structured products;
- insurance investment products;
- pension products;
- securitization products;
- real estate (property) products;
- etc.

There are many different ways to categorize customer-driven derivative products: by asset classes, by payoffs, by client sectors, etc. At the high level, they can also be categorized by the intended purposes of the derivative products, as seen in Table 1.1.

Retail structured derivative products are by far the most varied in product types and payoffs innovation across all major asset classes, including equity, commodity, interest rate, FX and credit. Structured derivative products modify the risk/reward profile and hence the risk-adjusted returns. Their returns can therefore be better defined and clarified. One can also incorporate protection barrier features into many types of product to reduce the risk of losing capital.

Structured life insurance products also become popular in the low interest rate environment, whereby insurance companies look into new investment areas and

TABLE 1.1 Customer-driven derivative products

Category	Intended Purpose
Structured Derivative Products	Structured derivative products are primarily intended for investment purposes. They offer investors alternative investment opportunities and access to new asset classes or markets. The buy side includes retail investors, high net worth and private banking customers, and institutional investors.
Derivative Hedging Products	Derivative hedging products are primarily designed for the hedging needs of institutional and corporate clients. They can be and should be used as effective risk management and mitigation tools. Large proportions of such products are interest rate hedging products.

products, in order to fulfil the promised coupons embedded in certain products. As life insurance institutions will be subject to Solvency II capital requirement, the products with low guarantee will attract lower capital requirement.

Structured derivative business has undergone profound changes over the years, in manufacturing processes and distribution mechanisms. The products become more tailor-made, coupled with the fact that distribution channels are moving towards e-platforms, which in turn encourages more individual product features. The manufacturing process encompasses product design, quantitative modelling, trading and risk systems integration, and validation. The overall process has become much more complex and infrastructures must also build in various required regulatory constraints. Therefore an integrated comprehensive manufacturing approach is vital to keep the whole process economically viable. The products' competitions have also been extended towards the longer end, from traditional short-dated (e.g. typically < 5 years) products to long-dated products, including pension products serving the ageing population.

Financial promotions of derivative products not only require the sell sides to get facts right, i.e. what the product does, what the cash and tenure commitment is it is also a compliant requirement to explain clearly to the customers the risks involved. Setting a strict and high standard on products and their risk management ensures a sustainable product design process which is vital for the long-term success of the derivative business.

LESSONS IN DERIVATIVES AND CRISES

Financial derivatives are a double-edged sword. Understanding and using them well, derivatives can be valuable investment tools, and effective risk management and mitigation instruments. Misunderstanding and misusing them can lead to amplified losses. Over the decades, there have been many documented and undocumented derivative losses. Table 1.2 lists some of the well-known and high profile cases dating back to early 1990s. These derivative losses resulted either from outright wrong and misunderstood positions or from unwinding losses because of forced margin calls.

Derivative Losses

As can be seen in Table 1.2, derivative losses have happened frequently in the past. While the frequency of these occurrences may have become less on average, the individual loss amount has actually become larger. This indicates that lessons have not been learned fully. Derivatives are highly leveraged instruments. One must fully understand the risky nature of the derivatives as well as their practical operational details. It is essential to build adequate technical and operational frameworks before embarking on highly leveraged activities. Derivatives business should consist of a comprehensive set of technical, risk management and operational control tools.

Table 1.2 does not include rogue trading that occurred at Barings, Société Générale and UBS. For completeness, they are listed in Table 1.3 and it is striking to see how similar they all look. The last column shows one of the common features of rogue trading; they all involved liquid index futures. Strong internal operational control is the key to prevent such rogue trading activities.

TABLE 1.2 Sample derivative losses

Decade	Organization	LOSSES	Transactions
1990s	Metallgesellschaft	\$1.3 billion	Energy futures
1990s	Codelco	\$207 million	Copper futures
1990s	Cargill (Minnetonka Fund)	\$100 million	Mortgage derivatives
1990s	Kashima Oil	\$1.5 billion	Currency derivatives
1990s	Procter & Gamble	\$157 million	Leveraged interest rate and currency swaps
1990s	Askin Capital Management	\$600 million	Repo and mortgage derivatives
1990s	Air Products and Chemicals	\$113 million	Leveraged interest rate and currency swaps
1990s	Piper Jaffray Cos.	\$700 million	Mortgage derivatives
1990s	Sears	\$237 million	Swaps
1990s	Orange County, Calif.	\$1.6 billion	Leveraged repo
1990s	Capital Corporate Federal Credit Union	\$126 million	Mortgage derivatives
1990s	Sumitomo Bank	\$1.8 billion	Copper futures
1990s	First Capital Strategists	\$128 million	Stock index futures
1990s	Postipankki	\$110 million	Mortgage derivatives and structured notes
1990s	NatWest	\$90 million	Interest rate options
1990s	UBS	\$170 million	Equity derivatives

(continued)

TABLE 1.2 (Continued)

Decade	Organization	LOSSES	Transactions
1990s	UBS	\$120 million	Equity derivatives
1990s	UBS	\$75 million	Convertible bonds
1990s	LTCM	\$500 million	Leveraged spreads
2000s	Allied Irish Banks	\$700 million	Currency derivatives
2000s	China Aviation Oil	\$550 million	Commodity derivatives
2000s	China State Reserve Co.	\$300 million	Copper futures
2000s	Hedge funds	Undisclosed large sum	Credit tranche baskets
2000s	Credit Suisse	\$120 million	Equity derivatives (Korea)
2009	A European Bank	€100 million	Bermudan swaptions
2009	Brazilian Corporates	\$28 billion	FX Tarfs (Real)
2009	Korean Corporates	\$4 billion	FX Tarfs (Won)
2009	Citic Pacific	\$2.4 billion	FX Tarfs (Australian Dollar)
2012	JP Morgan	\$6 billion	Credit derivatives index
2013	A Portuguese entity	€450 million	Exotic swaps with accumulating coupons
2014	Asian corporates	\$3 billion	FX Tarfs (offshore renminbi)

TABLE 1.3 Derivative rogue trading losses

Year	Organization	LOSSES	Transactions
1995	Barings PLC	\$900 million	Stock/index futures
2009	Société Générale	\$4 billion	Stock/index futures
2011	UBS	\$2 billion	Stock/index futures

Credit Crunch and European Debt Crisis

The banking landscape has changed forever following two major financial crises: the sub-prime triggered credit crunch in 2007/08 and European sovereign-debt crisis in 2012/13. Both crises led to the freezing of the global credit market. Derivatives were certainly not the cause of the crises, although in some cases they were misused. Many lessons can be learnt from the analysis of how the crises happened, as can be seen in Table 1.4.

Direct financial losses incurred by the financial institutions were massive during the crises. The losses in many large banks were running into tens of billions each. Ironically, the losses due to traditional banking activities such as (bad or excessive) lending

TABLE 1.4 Financial crises and their causes

Crisis	How Did It Happen?
Credit Crunch 2007/08	<ul style="list-style-type: none"> ■ Prior to the crisis, desire for home ownership and easy access to loans led to a boom in sub-prime mortgages in the USA. ■ Those very risky sub-prime mortgages were re-packaged using CDO pricing technologies by the banks, and sold to many other institutional investors worldwide. ■ The risks in the re-packaged instruments were massively underestimated and mispriced. The ratings were wrong too, as many of those instruments were rated AAA. As a result, investors worldwide held massively inflated and overpriced assets on their balance sheet. ■ When the US housing bubble burst in 2007, predictably, the values of those sub-prime repackaged instruments plummeted. ■ The liquidity in those sub-prime repackaged instruments dried up. ■ This in turn led to a wider liquidity crisis across the board, which eventually triggered a credit crunch in the entire financial market. ■ The credit crunch of 2007/08 extended its shadow from Wall Street to the High Street.
European Debt Crisis 2010/13	<ul style="list-style-type: none"> ■ Excessive national debt in some European countries had long worried investors. The sharply deteriorated debt-to-GDP ratio led to the fear of sovereign default. ■ When the new Greek government in late 2009 revealed that the previous budget deficit had been under-reported, investors' fear of sovereign default became real. ■ It eventually triggered a massive sell-off of sovereign debts and caused a sovereign debt crisis. ■ Contagion: the sovereign default crisis quickly spread from Greece to Ireland and Portugal, and later to the larger economies of Italy and Spain. ■ The sovereign debt crisis also exposed the fundamental imbalance within the eurozone.

were many magnitudes higher than the derivative losses if compared like-for-like, even though derivatives are perceived as more risky by the general public.

In the aftermath of the financial crises, financial institutions started fundamental changes and repositioning to de-risk and de-leverage. For example, one bank's leverage ratio (total assets exceeding tier 1 capital) was reduced from 68 times in December 2007 to 44 times in December 11. High leverage means high volatility in P&L, resembling derivatives. Leverage itself is a derivative on society, and too much of it will expose the economy.

REGULATIONS AFFECTING DERIVATIVE BUSINESS

The financial regulatory landscapes have evolved dramatically during and after the crises. Banks have been under increasingly tighter regulatory regimes, at various levels, from capital to liquidity to operational details. Financial regulations have become an extremely important part of the derivative business. Both the USA and the EU have

been introducing various laws and directives that will affect the business profoundly. All of these have implications on the day-to-day management of the business, and knock-on impact on derivative models and infrastructures.

Dodd–Frank and EMIR

No one can have a sound and prosperous derivatives business without embedding the relevant financial regulations into its operation framework and reporting infrastructures. Regulatory requirements can in fact affect the viability of certain trading and products distribution activities. The recent wide-ranging regulations affecting derivatives include:

- Dodd–Frank (the Dodd–Frank Wall Street Reform and Consumer Protection Act);
- EMIR (European Market Infrastructure Regulation).

Dodd–Frank has been written into law in 2010 in the USA. It covers areas of monitoring systemic risks, limiting/banning banks' proprietary trading (the “Volcker rule”) and new regulations on derivatives and consumers protection. All the major aspects of the banking activities, from trading to customer/consumer services, have been under intensive regulatory analysis and scrutiny. The “Volcker rule” effectively bans banks' proprietary trading activities, although trading activities of “market making” are exempt. Clearly, the definition of “market making” is very important in this context. As for customer/consumer services, transparency and accountability together with investor protections are specifically mentioned and emphasized, which have profound implications for how financial institutions should be run and managed.

EMIR was brought into force in 2012 by the European Parliament, putting strict regulations on OTC derivatives, central counterparties (CCPs) and trade repositories (TRs), with a view to controlling systemic risks and reducing counterparty credit risks associated with OTC derivatives. Under EMIR, the relevant financial institutions must observe the following obligations: central clearing for certain categories of OTC derivatives; risk mitigation techniques for non-centrally cleared OTC derivatives, such as using collateral and having adequate capital coverage; trade reporting to TRs; organizational and prudential requirements for CCPs and TRs.

The regulatorily required CCP clearing of certain OTC derivatives (such as IRS, OIS) can also bring about real capital and operational efficiency. Some clearing houses have already introduced trade compression for IRS, OIS, Basis, FRA etc. to reduce the line items and net notional. For example, a trade compression for a portfolio of fixed legs of the same counterparty will net the cash flows of the fixed rates having the same coupon dates. In essence, it generates a synthetic fixed leg with a weighted average blended fixed rate. By replacing those fixed legs with one synthetic fixed leg, compression can greatly reduce the number of line items. As a result, it can achieve much enhanced operational efficiency and reduced capital requirements for all counterparties. It is conceivable that the trade compression technique can be further extended to cover all linear instruments to achieve greater business efficiency.

Both Dodd–Frank and EMIR are designed with a view to preventing another financial crisis and promoting financial stability. Their scopes are wide-ranging, and their effectiveness clearly depends on how effectively they are implemented in the financial systems by the relevant financial institutions.

European Markets and Structured Products Governance

The European Securities and Markets Authority (ESMA) governance paper on structured retail products maps out the expected good practices for issuers and providers when manufacturing and distributing the products. The expected good practices are aimed at improving product providers' ability to protect investors, in particular in relation to the complex structured retail products, the nature and range of investment services and activities undertaken in the course of business, and the type of investors they target. The good practices guidelines cover a wide range of topics, including product design and testing, target market and distributing strategy, value at the date of issuance and transparency of costs, secondary market and redemption, and the review process.

It is conceivable that other types of financial instruments such as asset-backed securities or contingent convertible bonds being sold to professional clients will be under increasingly tighter governance. The regulator insists that sound product governance arrangements are fundamental for investor protection purposes. When properly implemented, it can reduce the need for product intervention actions by competent authorities.

The European Parliament has also approved MiFID II, the full implementation of which ESMA will oversee by 2017. MiFID II will directly impact on the product manufacturing and customer value chain with to the following two aspects:

- Much enhanced market transparency: The scope and scale of the financial instruments covered by MiFID II have been much widened, to include equity and fixed income markets, derivatives, bonds, commodity, etc. It requires transparency and accountability in both manufacturing and distributing process. Trading venues must be transparent and adequately controlled to provide level-playing fields. Institutions must ensure pre- and post-trade transparency, timely reposting etc.
- Much-increased investors' protections: The requirements will govern how financial firms should design, advise on or distribute MiFID instruments. MiFID II makes clear that complex products, including complex structured deposits, cannot be sold to investors on an execution-only basis. The requirements will promote greater price transparency, allowing retail investors to see more clearly the actual prices of various financial instruments, enabling them to compare prices and find the most competitive offer available.

Table 1.5 summarizes some key MiFID II features and coverage, and the relevant regulations derived from it relating to structured products.

EU-11 Financial Transaction Tax

The EU-11 Financial Transaction Tax (FTT) will be introduced in 11 EU countries: Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia and Spain. It will levy tax on financial transactions involving EU-11 counterparties. The financial instruments covered by FTT include cash management products, securities, derivatives and repos. FTT will impact the financial markets in a variety of ways and it will also impact derivatives pricing. The affected derivative instruments can impact end products pricing, either directly or via hedging.

TABLE 1.5 Regulations and key features

Regulations	Key Features
MiFID II (Markets in Financial Instruments Directive II)	MiFID rules cover Europe's overall markets and trading infrastructure. They include both conduct of business requirements (for example, gathering sufficient information to ensure the products are suitable or appropriate for the client) and organizational requirements (for instance, identifying and managing any conflicts of interest). One of the key elements for the structured products industry is the introduction of a stronger harmonized investor protection framework, in relation to financial instruments, such as shares, bonds, derivatives and structured products. On the regulation of OTC derivatives, MiFID II can further improve transparency, support orderly pricing and prevent market abuse. It complements EMIR, which mainly deals with central counterparties and trade repositories.
PRIPs (Packaged Retail Investment Products)	PRIPs can be viewed as a subset of MiFID II. It covers structured products and the Insurance Mediation Directive (IMD) rules for insurance-based investment products.
UCITS (Undertakings for Collective Investments in Transferable Securities)	Under MiFID II, shares or units in UCITS will be classified as complex or non-complex instruments. Previously, all UCITS have been classified as non-complex instruments. MiFID II introduces the exception of "structured UCITS", which will now be treated as complex instruments for the purposes of the execution-only regime.
UK's RDR (Retail Distribution Review)	This is UK-specific on investment advice. Independent advisers will need to match the client's profile and interests against a broad array of products available in the market. They will state whether they will provide the client with a periodic assessment of the suitability of advised products.

Corporate and retail customers will be exempted from FTT. Market-making activities will also be excluded from FTT, although the definition of "market-making" involves some details. The FTT will be levied at between 1 and 10 basis points per transaction. The direct and indirect impacts of FTT include:

- Transaction costs: Additional transaction costs due to FTT can be substantially higher than the headline tax rate (1 ~ 10bps). The real cost will be the sum of the entire transaction chain, for example from an asset manager, via a broker, through a clearing member to the clearing house, and round trip. Each one of them has to pay, say 10bps. So a headline tax rate of 10bps for a government bond transaction could on average become 40bps (for the tax collector) after going through the whole chain.
- Indirect costs: If financial institutions cannot or won't absorb the additional transaction costs, they will pass some or all costs to the end users. This will have knock-on effects on bid-offer spreads, liquidity, volume etc., increasing the indirect costs of financial transactions.

The impact of FTT on the derivatives business could be substantial. It will make certain hedging and risk management activities more expensive. EU-11 domiciled banks and counterparties who are subject to FTT can potentially lose their competitiveness in the affected derivatives markets. Specific to the derivatives business:

- **Derivatives pricing:** Transaction costs due to FTT cannot be ignored any more in some affected derivative products. Pricing in the transaction cost is therefore important, considering increased hedging costs. Intuitively, options with larger Gamma will be affected more by the transaction cost, as one needs to rebalance the delta hedge more often if Gamma is larger. Pricing in transaction costs can be challenging, though, as calculating local Gamma and/or cross Gamma is a computationally heavy task.
- **Derivative package/product:** A derivative product transacted with an end user often consists of and is hedged by a number of simple instruments. For example, a cross-currency swap can be replicated and hedged by single currency swaps, plus basis and FX swaps. The total cost of FTT on such derivative products can potentially mushroom during the course of risk managing and hedging. It is important for practitioners to understand FTT impacts properly, and make appropriate business adjustments accordingly.

STRUCTURED DERIVATIVE PRODUCTS GEOGRAPHIC FEATURES

Structured derivative products markets are very different in size and product types across geographic boundaries. The dominant business model for structured products has been to develop and distribute country-specific products tailored to specific markets (e.g. country indices or stocks) and appetites. The United States is by far the largest market in terms of issuance and complexity of products. In Europe, Germany and Italy have the largest structured derivative products issuances, followed by the United Kingdom. China's structured derivative products business is sizeable in volume but still in its early development stages. Every country has its own market features and product preferences. In the following, we shall summarize some of the key market and product features in the selected countries, to obtain a holistic snapshot of the geographic characteristics.

United States

The US structured product market has evolved for many decades since the 1980s, and is more mature than the others. The majority of the structured products are now issued in the forms of structured notes, structured funds and structured deposits. These products are typically sold over-the-counter, although some may be listed on the exchanges. The annual sales do vary from year to year, and it is estimated to be in the range of USD\$55 ~ USD\$75 billion.

In terms of product types, US has certainly the most complex structured products in all major underlyings, including equities, interest rates, commodities, credit and currencies. Even in the era of credit crunch and European debt crisis when most of the other countries only having very simple products, one can still find rather complex products in the US across all major asset classes.

The equity-linked products are among the most popular categories, with underlyings in equity indices and single stocks. In the prolonged low volatility environment whereby the structured products pricing is difficult, there are more single stock underlyings as they tend to have larger volatilities than those of equity indices. From time to time, theme-based investment demands also drive the creation of single stock structured products. For example, auto-callable products based on internet single stocks are popular in the aftermath of giant internet company IPOs.

The issuances in currency basket, hybrid basket (e.g. CMS and S&P500), commodity index and long-dated equity for leveraged return products are also frequent. Although the embedded callable or auto-callable features can shorten the durations, in general the products in the US are longer-dated than their European or Asian counterparts.

Compared to other countries, the US market has more retail structured products based on interest rate exotics. For example, products such as callable inverse floater, callable (step-up) fixed-rate note, callable CMS steepener, fixed to floating rate notes are often issued by banks to retail investors. In Europe, these types of interest rate exotic products are deemed as more suitable for professional (institutional or corporate) clients.

European Union

In the European Union, structured product landscapes are very different in different countries. Germany and Italy are the largest in terms of market size and volume, followed by Switzerland, Spain and the UK. In each country, usually only one or two asset classes (e.g. equities and/or interest rate) are the dominant reference underlyings that driving the vast majority of the issuances. In the following, we shall have an overview of Germany, Italy and the UK.

Germany In Germany, the annual sales of retail structured products are in the order of EUR€40 ~ EUR€50 billion, and the open positions are in the region of EUR€100 billion. Many structured products are listed in exchanges, and the exchange annual turnover is in the order of EUR€45 billion. Public distribution is a very important distribution mechanism in Germany and product demands are often driven by macroeconomics.

The major underlying asset classes are equities and interest rate. Equity-linked products tend to be larger in the number of issuances, although interest rate-linked products can sometimes be larger in volumes. While simple interest rate (EURIBOR or LIBOR)-linked products remain popular, equity-linked structures have been increasing from previous years. The current increase in equity-link products is mainly driven by the capital protection structures that the equity asset class can offer in the low interest rate and low volatility environment. Underlyings that have potentials of delivering higher yield such as blue chip stocks and baskets have been chosen to enable capital protection and attractive pricing.

Sub-dividing the overall structured product volume into investment and leverage product category, interest rate underlying can account for more than 55% of the volume in the investment product category, while equities account for more than 80% of the volume in the leverage product category. The other asset classes such as credit, currencies and commodities tend to be rather small in size.

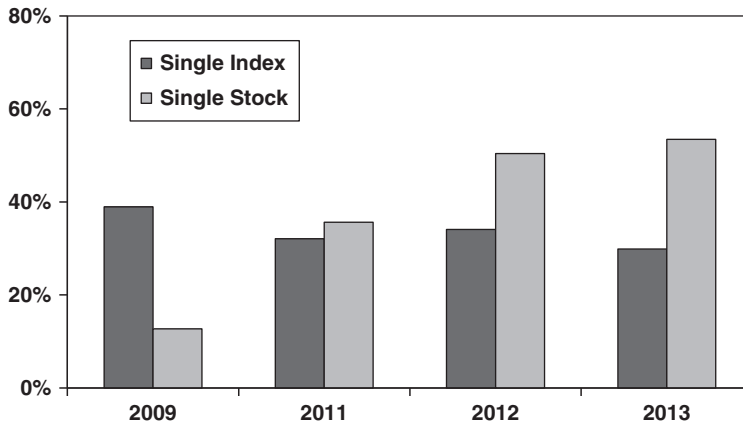


FIGURE 1.1 Germany equity underlying (index, stock)

Among the equity-linked products, single index and single stocks are the largest underlyings. Figure 1.1 illustrates the proportions of the two classes of underlyings over a 4-year period. During this particular sample period, the single stock products were becoming more popular, although there was substantial portion in the single index products. The pattern may change over time, but both single index and single stock are key components in the German market.

Structured notes and certificates are two popular product wrappers in Germany. The product payoffs are wide-ranging, from capital-protected notes to express and bonus certificates. Reverse convertibles, discount and tracker certificates are also very common. More products are being listed and distributed on the exchanges, partly due to the less stringent requirements of form filling compared to issuing products via bank branches for example. Additionally, leverage products are in demand and they are well suited for exchanges. The exchange-traded warrants and structured mini-bonds, partly due to their leverage nature, are gathering popularity.

Italy Italy's structured products landscape was severely impacted by the collapse of Lehman Brothers in 2008. Lehman had sold many index-linked products to the Italian insurance sector, which were subsequently distributed to retail policy holders. Theoretically, the end users (retail policy holders) would bear the counterparty risk (the collapse of Lehman). However, for a variety of practical reasons, the insurance companies had to compensate retail policy holders, effectively taking up the Lehman counterparty risk even though they were technically intermediaries. Subsequently, Italy's insurance regulator ISVAP decreed that the insurers would carry the counterparty risks of any products they sell. The viability of distributing prepackaged structured products via insurers is now in question.

For the structured products as a whole, Italy's securities market regulator CONSOB stipulates that product distributors have to formally distinguish between "liquid" and "illiquid" products. For "illiquid" products, which include OTC derivative products, strict documentation, pricing and reporting standards are required. If a distributor wishes to sell an "illiquid" product, including a structured product, it has to have an internal

independent price evaluation models and provide investors with regular reports on the product's performance. Typically, separate Monte Carlo pricing and statistical analysis is needed for every product issuance, in order to meet CONSOB's prospectus requirements.

CONSOB pays a great deal of attention to the products considered as “complex” and/or “dangerous” in the retail market. To limit retail customers' risks to such products, CONSOB compiled a list of “complex financial products” (including asset-backed securities, convertible, structured and credit-linked products, etc.) and recommended intermediaries not to offer them to retail investors. The intermediaries are expected to maintain the coherence between the products offered and customers' profiles, at the distribution stage as well as the product design stage. CONSOB also requires structured products providers to abstain from offering and placing certain “very highly complex financial instruments” to retail investors.

Annual sales of retail structured products in Italy is in the region of EUR€35 ~ EUR€45bn. Overall the volume of issuance with equities as underlyings is broadly similar to those with interest rates as underlyings. The issuances of certificates linked to equity underlyings are on the rise in the low interest rate and low inflation environment.

For the equity-linked products, single index and single stocks are the two key categories of underlyings. Figure 1.2 illustrates the proportions of the two classes of underlyings over a 4-year period. During this particular sample period, the volumes of single stock products had increased relative to the single index. The rise of single stock products was mainly driven by the demand for higher coupons and more interesting payoffs. The pattern may fluctuate over time, and a substantial portion of the equity-linked products was still referencing a single index.

Structured certificates and fund-linked products have a range of payoffs, including protected tracker, capped or uncapped call, reverse convertibles, digital and callable. As all listed products are automatically classified as “liquid” under CONSOB's rules, there is a strong incentive to get products listed on the Borsa Italiana. Listed products tend to be the simple payoff types. Leverage products are also in demand and they are well suited to listing on the exchange. Certificates designed to suit the specific financial environment can sell well in Italy. For example, in 2014/2015, when the

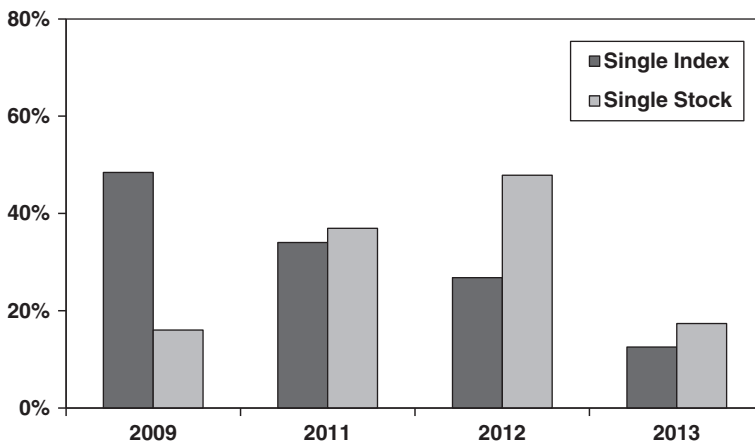


FIGURE 1.2 Italy equity underlying (index, stock)

markets were steadily positive and moving sideways, autocallable (express) certificates and capital-protected certificates were popular with investors. These short-term (e.g. 3-year) certificates have indeed generated good returns for investors.

United Kingdom In terms of the market size, UK structured products annual sales are in the order of GBP£10 ~ GBP£15 billion. The total outstanding client positions are in the region of GBP£60 billion. The vast majority of the retail structured products are equity-linked, and there is little in the way of FX, commodity or interest rate-linked products in the retail space.

The typical product wrappers are:

- **Investment plans:** These plans are typically offered via intermediaries, such as Independent Financial Advisers (IFAs). They are administrated either by a third party or the issuer. The plans are often targeted to the NISAs and SIPP investors who have no tax liability on the returns. The plans are also marketed as tax-efficient investments (within the limit) as, for the direct investors who pay UK tax, the returns of the plans will be treated as capital gain instead of income.
- **Structured deposits:** These are offered by banks and building societies as fixed-term deposit/saving accounts. The returns will be treated as interest income and subject to income tax, unless it is wrapped in a NISA. The deposit/saving with authorized firms is protected by the Financial Services Compensation Scheme (FSCS).
- **Exchange-traded structures:** These are typically issued as certificates, and are listed on the London Stock Exchange as full tradable securities. The listed securities have the benefit of transparency and liquidity. The exchange-traded structures are quoted throughout the trading day.

For the equity-linked products, single index is very dominant in the UK as shown in Figure 1.3. FTSE-100 is the most popular index followed by EURO STOXX 50 and S&P 500. Basket of indices is often used, but there is very little in single stocks.

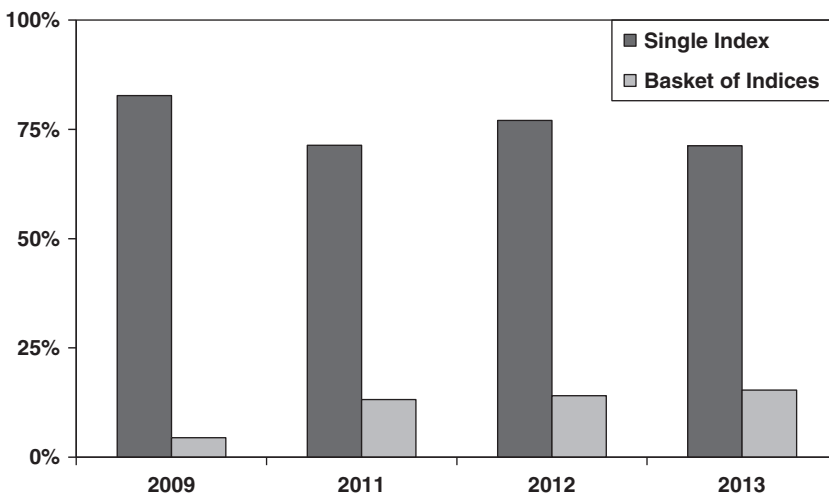


FIGURE 1.3 UK equity underlying (index, basket)

Apart from underlying liquidity and investors' risk appetite and familiarity with the indices, UK's stamp duty on share transactions may have depressed the single stock-based product offering. It is conceivable that financial transaction tax on stocks, which makes hedging single stock-based products very expensive, can skew the markets and product offerings.

Over the years, the mainstream structured product payoffs in the UK have been fluctuating among capped or uncapped call, digital, reverse convertible and kickout (auto-callable). In the low interest rate and low volatility environment, kickout products are very popular and they constitute a very large portion of the business. Basket underlying is sometimes used in the kickout products to enhance the headline rate.

China

China's financial systems are still evolving. Its structured products markets are very different from the western counterparts in both framework and contents. The overall picture therefore seems to be more complex from a western perspective.

Markets and Drivers In China, commercial banks including city commercial banks, rural commercial bank and rural credit cooperatives, can issue structured products to attract short-term deposits. Trust products, private equity limited partnership products and increasingly the internet products are the other main forms of structured (fixed income) products in the market. The so-called "shadow banking" encompasses segments including trust companies, wealth management and private lending among individuals. Structured products are typically categorized as part of wealth management products (WMPs) family, as illustrated in Table 1.6.

TABLE 1.6 WMPs and structured products

WMPs Family	Key Features
Fixed Coupon Products (Non-Structured WMPs)	Paying fixed coupon, typically higher than the bank deposits. They are effectively credit products. Because they are perceived as having an "implicit guarantee" by the distributing banks, they appear to be more attractive than equivalent bank deposits. These WMPs do not involve the use of options or derivatives, and they are equivalent to fixed-term deposits with short maturities (e.g. less than a year). These asset pool products tend to roll over after maturity.
Structured Products	These are genuine structured products with purpose-built risk profiles. Although they contain issuer credit risks, they are principally exposed to the risks in interest rate, equity, FX, gold, etc. Private banking and retail investors are the key customers.

The market size is varying, but the overall trend is growing. An estimated annual issuance of all short-dated (< 1 year) WMPs is in the order of 10 trillion Yuan, equivalent to about USD\$1.7 trillion. Among WMPs, the actual structured product issuance is in region of USD\$25 ~ USD\$35 billion equivalent in 2015.

One of main issuers of WMPs is the trust companies. The investment trust industry is one of the main players in WMPs. The trust companies are usually selling the trust products through the wealth management divisions of commercial banks. The products distributed by banks are perceived as having “implicit guarantees”, meaning that the distributing banks may compensate investors if products default. Whether the “implicit guarantee” holds when default happens or it is simply a misunderstanding on the investors’ part, can only be decided when a real default case sets a precedent. Nonetheless, when the credit-risky fixed coupon products paying much higher yields are perceived as guaranteed by banks, investors will go for those products rather than banks’ deposits of similar maturities.

Another main wrapper for structured products is structured deposits. These are aimed at Chinese domestic savers and investors. Providers can also issue through the QDII (qualified domestic institutional investors) scheme, which allows Chinese institutional investors to invest abroad. Through QDII, these investors can be introduced to some of the best-selling structures abroad.

Both customers’ investment needs and banks’ desire for alternative funding drive the rise of the issuance of WMPs. It is true that some investors are looking at the return side of the high-yielding WMPs without paying adequate attention to the associated risks. They are drawn by the expected return rate and the implicit capital guarantee, while the risks in products are often overlooked. However, investors’ increasing awareness of credit risks in the fixed coupon products will shift their attention to the structured products in the WMPs family.

The liquidity needs can encourage banks to raise cash through the issuance of WMPs targeted at deposit-rich companies and households. China regulatory framework is also evolving, and it can have significant impact on the product issuance. For example, the introduction of the asset management plan pilot scheme by the regulator triggers a volume increase of alternative funding products via the structured product channel.

Overall, the biggest demand for structured products is from the retail investors, accounting for about 70% of the total notional. Institutional investors have a market share of around 20%. The remaining gap is filled by private banking customers etc. Insurance companies have become a potential driving force for structured products, following the introduction of new relaxed rules by the China Insurance Regulatory Commission (CIRC) over the use of derivatives for hedging purposes by insurers. Insurance companies can now use OTC options and swaps to hedge market risks on their equity holdings or lock-in profits from winning open positions.

Regulatory Development China Securities Regulatory Commission (CSRC) in 2012 gave the green light to banks and securities firm to issue structured products, provided it is risk-neutral, namely they are collateralized and have no risks on issuers’ books.

In order to better control the risks associated with alternative funding through WMPs, the regulator recently introduced the use of asset management plans (AMPs) among domestic banks. AMPs will not be able to assign expected returns to their offerings and providers of such products are required to regularly publish net asset values,

and disclose the underlying assets backing the products. Specifically, under the AMPs scheme:

- banks can sell asset management plans directly to customers, instead of via other local banks;
- an implicit guarantee of principal and yield by WMPs in the form of expected return is removed;
- banks earn an explicit management fee simply by issuing asset management products to customers, instead of implicit fees from the spread between the actual return and the cap promised to investors;
- banks no longer have to use third-party intermediaries to structure off-balance products. As publicly-traded instruments, the asset management schemes provide enhanced transparency to investors.

Key Products and Trend The payoffs of structured products in China are much simpler than their counterparts in the West. Vast majority of the issuances are capital-protected vanilla products, and typical embedded options are call, digital, up-and-out call (shark fin), etc. The popular underlyings are gold, FX, interest rates (Shibor-linked) and some equities. Most of the products are typically very short-dated (3 months or 6 months). Investors had preferred short-dated products because of their higher flexibility and liquidity. However, there are severe limitations on short-dated products in terms of market exposures and potential higher returns. As the structured products market becomes more mature and investors have a better understanding of the products, the dominance of short-dated products is being contested by a gradual trend for longer-dated (more than 1 year) products. Longer-dated products allow investors not only higher expected returns, but also exposures to more underlyings including commodities, domestic and overseas equities.

Chinese investors tend to pay more attention to yield than the underlying. Up to now the global product offerings involve underlyings that are mostly overseas assets. The choice of domestic stocks as suitable underlyings for the structured products is limited but expanding. Since the introduction of future contracts on the SSE (Shanghai Stock Exchange) Composite Index, the stock market underlying has become a reality, again mostly for short-dated products ranging from a few days to two years. In February 2015, China introduced its first exchange-listed option on Exchange Traded Fund (ETF). The option underlying Huaxia SSE 50 ETF tracks the performance of the SSE 50 index, which consists of 50 blue chip stocks. The introduction of ETF listed options is an important step forward in the development of China's listed and OTC derivative markets. It facilitates hedging, price finding and market transparency, allowing practitioners to build more reliable implied volatility surfaces for example. It is expected that after ETF options, stock index options and single stock options will be introduced in due course on SSE and SZSE (Shenzhen Stock Exchange). Structured products based on blue chip stocks will be boosted as a result.

China's OTC Shibor-linked derivatives market is also expanding. Standardized Shibor-linked vanilla derivatives have also been rolling out. Standardized Shibor-linked derivatives can be used as interest rate hedging tools, and will facilitate interest rate liberalization in the country through enhanced market transparency. Some of the latest examples include 1-month OIS based on the overnight Shibor rate, 3-month swap

based on the one-week Shibor rate, 3-month swap based on the seven-day repurchase rate and 3-month Shibor FRA. These provide standardized points of reference, catering for the growing demand for more efficient trading and hedging of interest rate risks from practitioners, including structured products issuers.

It is clear that structured products based on local currency and local underlyings will become popular in the future, when domestic market hedging capabilities are built up. As China is also undergoing interest rate liberalization, high-yield fixed income products may gradually lose their attraction. Sensibly designed structured products can be viable replacements in the long term.

China's financial markets are still evolving with its economic development and social needs. One example is how the country should handle its demographic situation and look after older people financially. There have been numerous discussions on the topic and new policies are emerging along the line of "utilizing houses to look after pensioners". It is conceivable that equity release (reversion) products will be manufactured and distributed by the insurance companies. As these types of products often have embedded real estate derivatives, it is vital for the Chinese customers to understand the benefits as well as the risks in those products.

