

Investment banking: linkages to the real economy and the financial system

By Kushal Balluck of the Bank's Banking and Insurance Analysis Division.⁽¹⁾

- Investment banks play a key role in capital markets and contribute to the efficient functioning of financial markets. As demonstrated in the recent financial crisis, however, investment banks can create and propagate risks in the financial system given their scale, as well as the interconnected and complex nature of their activities.
- Recognising investment banks' systemic importance, a number of international regulatory initiatives have come into force since the onset of the recent financial crisis.

Overview

The main activities of retail or 'high street' banks, such as accepting savers' deposits, making loans and providing payment services, are well known. In contrast, the functions of investment banks are typically less well understood. **This article describes what investment banks do and highlights some of the risks that they can pose.** Along the way, it attempts to explain some of the terminology frequently used in relation to investment banking — from 'SPVs' and 'CDOs' to 'bid-offer spreads' and 'dark pools'.

Investment banks help organisations such as companies and government agencies to raise finance through capital markets. When a company wishes to borrow money by issuing a bond, for instance, investment banks can help match the company with investors. Investment banks also underwrite the issuance of shares or bonds — that is, they guarantee to provide finance at a pre-determined price when the shares or bonds are issued.

Investment banks trade in a wide range of financial instruments — including shares, government and corporate bonds, foreign exchange and commodities such as oil or precious metals, and related derivative instruments. For the most part, they carry out trades on behalf of their clients. Trading in financial instruments (via an investment bank) can help companies to manage their risks. Other clients for these trading services include retail banks, insurance companies, and financial institutions that manage savers' funds, such as pension funds and hedge funds. These trading services can contribute to the efficient functioning of financial markets, thereby serving the needs of end-investors in the real economy. That said, some trading activities, such as the 'proprietary trading' that investment banks carry out

for themselves (rather than on behalf of clients), may not provide such a clear benefit to market functioning.

Investment banks also bring risks to the financial system. With the trading assets of the ten largest banks summing to more than £5 trillion,⁽²⁾ the sheer scale of these banks' operations means that liquidity conditions in financial markets can be vulnerable to the failure of a single firm. In addition, the web of interconnections between investment banks and other financial institutions can act as a channel for the transmission of losses throughout the system, while the complexity of some of their activities also contributes significantly to risks in the global financial system.

Many of these risks crystallised during the recent global financial crisis when some of the largest global investment banks were taken over, bailed out using public funds or declared bankrupt after facing distress. And they remain relevant to financial stability in the United Kingdom, with all of the largest global investment banks having operations in London.

A number of regulatory initiatives globally have been implemented since the onset of the global financial crisis to correct the fault lines that contributed to it and to build a safer, more resilient financial system to serve the real economy. The Bank of England has a key role to play in working with other regulatory bodies globally to fully implement these measures and ensure that investment banking activities are conducted in a way that is safe and sound.

[Click here for a short video that discusses some of the key topics from this article.](#)

(1) The author would like to thank Theodore Agbandje-Reid, Andrew Feeney-Seale and Jean-Michel Mazenod for their help in producing this article.

(2) Based on the data shown on Table A on page 2.

Most people are familiar with the main functions of retail banks — sometimes referred to as ‘high street banks’. These include providing deposits and payment services, as well as making loans. In contrast, investment banks help companies, other financial institutions and other organisations (such as government agencies) to raise finance by selling shares or bonds to investors and to hedge against risks. Unlike retail banks, they do not directly serve households.⁽¹⁾ In addition, investment banks trade in shares, bonds and other assets with other financial market participants, such as insurance companies, pension funds and hedge funds.

All of the large global investment banks have a presence in London. These banks therefore contribute to UK economic activity, and help support the efficient functioning of the financial system. But investment banks also bring risks to the United Kingdom’s financial system. During the recent crisis, investment banks were criticised for their excessive risk-taking and their role in the creation and systematic mispricing of complex securities. Their activities generated risks which contributed to financial instability globally and in the United Kingdom.

To help manage these risks, investment banks are subject to regulation. In the United Kingdom, legal entities that have permissions to deal in investments are referred to as ‘investment firms’. Some investment firms are subject to prudential regulation by the Bank of England’s Prudential Regulation Authority (PRA) by virtue of their importance to the stability of the UK financial system.⁽²⁾ But investment banking operations are not exclusively carried out by investment firms and some entities that carry out investment banking activities are also PRA-regulated due to their retail banking activities. Investment banking activities in the United Kingdom can also be carried out by UK branches of foreign banks. In these cases, PRA regulation is limited and prudential responsibility lies with the home regulator.⁽³⁾ All financial firms and activities in the United Kingdom are also subject to conduct supervision by the Financial Conduct Authority (FCA). In addition, the Financial Policy Committee (FPC) at the Bank of England is charged with identifying, monitoring and taking action to remove or reduce systemic risks — including those created and propagated by investment banks.⁽⁴⁾

Table A shows the fifteen banking groups with the largest investment banking operations globally. While all of these banking groups provide investment banking services, most of them operate a universal banking model, providing other retail and corporate banking services — such as accepting deposits, making loans and facilitating payments — alongside their investment banking activities.

These groups are some of the largest and most systemically important banks globally and all of them have operations in the United Kingdom. These operations are regulated by both

Table A Banking groups with largest global investment bank activities at December 2013^(a)

Banking group	Trading assets, £ billions
JPMorgan	895
Goldman Sachs	683
Bank of America Merrill Lynch	665
Citigroup	625
Deutsche Bank	595
Morgan Stanley	564
Credit Suisse	511
Barclays	481
BNP Paribas	386
Société Générale	369
HSBC	351
Royal Bank of Scotland	347
UBS	256
Crédit Agricole	163
Mitsubishi UFJ	144

Sources: SNL Financial, published accounts and Bank calculations.

(a) Measured by trading assets. Trading assets are securities, commodities and derivatives held for trading. Derivatives have been adjusted for differences in accounting treatment. Reverse repos have been excluded.

the FCA and the PRA, and together dominate the provision of investment banking services here. They are also eligible for access to the Bank of England’s liquidity facilities through the Sterling Monetary Framework. The Financial Stability Board (FSB) designated all of them as global systemically important banks (G-SIBs).⁽⁵⁾ Their status as G-SIBs subjects these banking groups to higher prudential standards. They are required, for example, to have greater amounts of capital (that is, an additional capital buffer) to reduce the likelihood of their failure and protect the global financial system.

The first section of this article provides a summary of the services provided by investment banks. No prior knowledge of this type of financial institution is assumed. The second section then explains conceptually how the various functions of investment banks can serve the real economy through a number of channels, including via the financial system. A decomposition of the global revenues of some of the largest investment banks can be used to gauge the relative importance of these channels. Finally, the third section outlines the risks posed by investment banks and their activities, and summarises the regulatory initiatives agreed after the crisis to mitigate these risks. A short video explains some of the key topics covered in this article.⁽⁶⁾

(1) However, investment banks are often part of larger banking groups, which have other operations such as retail banking and wealth management that do serve households.

(2) See Bank of England (2013) for more detail on the designation of investment firms for prudential supervision by the PRA.

(3) See Bank of England (2014a) for more information on the PRA’s approach to branch supervision.

(4) For more details on changes to financial regulation in the United Kingdom following the recent crisis, see Murphy and Senior (2013).

(5) See Financial Stability Board (2013) for a full list of global systemically important banks.

(6) www.youtube.com/watch?v=eTqT0psuSjk.

What investment banks do: an overview

This section provides an overview of three types of services provided by investment banks. First, it describes investment banks' activities in 'primary capital markets' — those markets used by companies to raise finance by issuing shares and bonds to investors. Second, it explains their trading activities. These include buying and selling shares and bonds that have already been issued — that is, those trading in 'secondary markets' — but also writing derivative contracts for their clients. Finally, it describes the role that investment banks play in financial market infrastructure, and in markets where financial institutions borrow and lend cash or securities in 'secured', or collateralised, transactions.

Primary capital markets

Investment banks help companies and government agencies to access finance for investment or other expenditure by providing underwriting services, whereby the investment bank agrees to purchase, at a pre-determined price, any securities — equity shares and bonds — that are not taken up by investors. By doing this, the investment bank guarantees that the amount of financing that the client wants to raise will be available, and removes uncertainty and risk for the client. By helping companies and governments manage this risk, investment banks facilitate access to finance through capital markets. Corporate clients tend to be large companies that are required to disclose information to investors and can thus attract funding in capital markets, rather than rely on retail banks to lend to them. But investment banks serve smaller companies too. Investment banks also provide 'leveraged loans' directly to companies. These are loans to highly levered companies, sometimes to fund specific projects, including acquisitions. When underwriting large transactions or providing leveraged loans, investment banks sometimes form a 'syndicate' with other banks — a group that shares the risks by splitting the total amount loaned or underwritten between members.⁽¹⁾

Alongside their underwriting service, investment banks typically run a 'book building' process (they are known as 'book runners').⁽²⁾ During this process, they try to find investors who are willing to buy the securities that will be issued by their clients. They typically promote the issuance to investors in the run-up to an auction, where investors are invited to bid for the securities. Investment banks also sometimes carry out a 'due diligence' process — where they review a company's operations to ensure that they have not been misrepresented to investors — and help with the preparation of legal documentation for clients.⁽³⁾ The book-building service is crucial for matching up investors (the providers of capital or credit) with issuers (users of capital or borrowers of credit).

In addition to facilitating equity and debt issuance, investment banks play an important role in the process of securitisation, which can support the provision of credit in the real economy. Securitisation involves pooling together various types of debt such as mortgages, credit card loans, student loans or commercial real estate lending. These pools of loans are typically moved to a separate legal entity (or 'vehicle', known as a special purpose vehicle (SPV)) from which securities are issued to investors.⁽⁴⁾ The returns on these securities are dependent on the principal and interest repayments of the loans to which the securities are linked.

The most common role for investment banks in the securitisation process is to arrange the transaction. This involves structuring the securitisation into different 'tranches' or portions — each tranche issues a different security with its own risk and return profile, based largely on the order in which investors get repaid on the loan portfolio.⁽⁵⁾⁽⁶⁾ Investment banks also act as underwriter, whereby they undertake the book-building process. Finally, they can help the SPV to hedge its risks using financial instruments such as derivatives; provide a liquidity line (a facility that allows the special purpose vehicle to borrow cash); and offer administrative support services (such as cash management).

The primary purpose of securitisation is to repackage loans into a series of related securities that can easily be traded by investors — 'asset-backed securities (ABS)'. Like debt and equity securities, once ABS have been issued, they can be traded by financial market participants. The creation of a security allows a lender to easily transfer the risks and rewards from a set of loans to other investors such as other banks or asset managers. A lender may do this to improve its liquidity position, either by raising cash by selling existing loans for securitisation, or by using the ABS — which are more liquid than raw loans — as collateral against which to borrow cash. This, in turn, can support credit provision to the real economy: the knowledge that a lender may be able to sell ABS to other market participants in the event that it needs to raise cash means that the lender may be more likely to provide credit in the first place.

Securitisation gained prominence during the recent global financial crisis, when the opaque and complex nature of some

(1) See Gadanecz (2004) for a description of the loan syndication process.
 (2) Investment banks sometimes facilitate the issuance of shares or bonds through book building without providing an underwriting service.
 (3) This is the case for initial public offerings (IPOs), for example, where a client lists its shares on an exchange for the first time. Investment banks typically help companies to meet the exchange's rules.
 (4) For a fuller explanation of how securitisation works, see Hull (2008), pages 536–40.
 (5) For example, the most senior and safest tranche (so-called 'AAA' tranche) would typically have first recourse to the loans, and would earn the lowest return. The 'equity' tranche would typically be paid the remainder of the cash flows from the loans once all the more senior tranches have been paid.
 (6) Arranging a securitisation transaction also involves arranging credit ratings for each tranche from credit rating agencies, helping to facilitate the documentation and securing the participation of third-party providers of services to the SPV. See Cetorelli and Peristiani (2012) for a fuller explanation of the role of banks in the securitisation process.

securitised products was associated with the large losses generated at many financial institutions. These risks are covered in the final section of this article.

Secondary markets and derivatives

Investment banks also provide market-making services (and are sometimes referred to as 'market makers'), whereby, at their clients' request, they buy and sell financial instruments that are already in issue — that is, instruments trading in secondary markets. By doing this, they add depth to the market and they improve the chances that a buyer or seller finds a counterparty to transact with, at a given price, thus providing 'market liquidity'.⁽¹⁾⁽²⁾ This is particularly important for trading in financial instruments such as corporate bonds, which are not traded via a central limit order book on an exchange (like companies' shares on the London Stock Exchange), but instead rely on investors contacting market makers for quotes. Investment banks provide these trading services to a range of clients in the financial sector, which are often described as 'institutional investors'. These are asset managers such as pension funds or hedge funds, which manage savings on behalf of individuals, as well as insurance firms, which manage large cash pools from their customers' premium payments and to cover products such as annuities.

The knowledge that securities can easily be traded in secondary markets reduces investors' risk of participating in primary issuances and holding securities for longer than they would like. If an investor knows that there is likely to be a liquid market that a bond can be sold into, then he or she would be more likely to buy it in the first place. In this way, trading activity supports the provision of finance in primary capital markets. Annex 1 provides further explanation of how investment banks provide market-making services.

As part of their trading services, investment banks also trade in derivatives with their clients. Non-financial companies can use derivative contracts to hedge their risks. Consider a UK-based manufacturer that exports goods to the euro area and sells them in euros, and suppose that the company is worried about the possibility of sterling appreciating *vis-à-vis* the euro — which would reduce its revenues in sterling terms. To protect itself against this risk, the company may buy GBP/EUR futures contracts that would yield a profit in the event of an appreciation of the pound against the euro and *vice versa*. In the case of futures, which are traded on-exchange, an investment bank could merely be facilitating the trade by providing access to the exchange. But investment banks predominantly write more bespoke derivative contracts, traded outside of centralised exchanges, for their clients. Retail banks also make use of derivative contracts to manage their risks. For example, a retail bank might issue a fixed-rate bond but prefer to pay out floating-rate interest payments in order to better match the cash flows on its loans and deposits.⁽³⁾

Investment banks provide some ancillary services alongside their market-making activities. For example, they produce research aimed at informing their clients about factors which may affect interest rates, exchange rates and the price of financial assets such as shares, corporate and government bonds and commodities such as oil or precious metals. They can also contribute to industry-wide benchmarks from which the prices of certain financial instruments are set. And they create indices based on the prices of a group of securities. These activities contribute to the institutional design of the financial industry through the creation of standards which are useful to participants. Indices, for example, allow investors to track the performance of the bonds or equities issued by one industry relative to other industries, or track the performance of a company relative to the rest of its sector.

Proprietary trading

Investment banks can also trade in secondary markets on their own account, rather than to serve clients. For example, many investment banks enhanced their revenues in the years prior to the crisis through 'proprietary trading': investing the bank's surplus cash reserves into high-yielding securities or derivatives. These were investments where traders bought or sold financial instruments with the aim of profiting from expected fluctuations in market prices. Banks disclose very little information on their proprietary trading activities, so it is difficult to gauge their magnitude, but the data available suggest that, relative to activities serving clients, they were not a large contributor to trading revenues even prior to the crisis, although they were a source of material losses during the crisis at certain banks.⁽⁴⁾

Unlike trading to facilitate market-making, the net benefit to the real economy of proprietary trading by investment banks is more open to debate. On the one hand, more trading in secondary markets improves market liquidity. But on the other hand, proprietary trading can leave investment banks vulnerable to large, potentially destabilising losses⁽⁵⁾ which may then impede their capacity to supply financial services. In addition, the existence of proprietary trading desks that aim to maximise returns on their trading portfolio may create conflicts of interest for investment banks when entering into trades with clients.⁽⁶⁾

(1) See Box 4 of the Bank's December 2014 *Financial Stability Report* for an explanation of the drivers of market liquidity; www.bankofengland.co.uk/publications/Documents/fsr/2014/fsrfull1412.pdf.

(2) Investment banks may be less willing to provide these services in stressed market conditions, where volatile market prices can bring about losses on their trading portfolios. See Benos and Wetherilt (2012).

(3) It would do this by using an 'interest rate swap'. See Annex 1 for a short description.

(4) For example, see United States Government Accountability Office (2011).

(5) See the Parliamentary Commission on Banking Standard's report on proprietary trading.

(6) Conflicts of interest also exist when investment banks provide underwriting and advisory services. Internal information barriers known as 'Chinese walls' are typically put in place to prevent traders from exploiting this information.

This activity has reduced considerably since the crisis as many investment banks shut down their proprietary trading operations in part as a result of regulatory changes.⁽¹⁾ These measures are discussed in the final section of the article.

Securities financing and providing infrastructure

Investment banks are key participants in the securities lending market.⁽²⁾ Securities lending is the temporary transfer of financial securities, such as equities and bonds, from a lender to a borrower. Investment banks may borrow securities on their own behalf or on behalf of other institutions such as hedge funds. For example, investment banks can borrow securities to meet customer demand when providing market-making services. And hedge funds may borrow securities via investment banks to sell them — so-called ‘short-selling’ — as part of their trading strategy.⁽³⁾ Lenders of securities are commonly referred to as ‘beneficial owners’. They are typically investors such as pension funds and insurance companies, and lend out securities to generate additional income on their asset portfolios. In their role as intermediaries, investment banks can help to match the beneficial owners and end-users of securities.

As well as arranging securities lending transactions, investment banks also facilitate transactions in repo markets. A repurchase agreement, or repo, is essentially a secured loan. An institution borrows cash by selling an asset, for example a government bond, which it later repurchases at a prearranged price. The counterparty has recourse to the bond as collateral until the repurchase date. Borrowers in repo markets are typically financial institutions seeking to finance their operations. By acting as middlemen, investment banks facilitate the provision of credit to financial institutions. Annex 2 on ‘The organisation of an investment bank’ provides further detail on the operations through which investment banks help to recycle securities in financial markets via securities lending and repo transactions (together termed ‘securities financing transactions’).

Major investment banks also play an important role in financial market infrastructure by providing clearing services to other financial institutions, including via central counterparties (CCPs).⁽⁴⁾ A CCP, or clearing house, is a financial institution that acts as a counterparty to numerous participants in financial markets to clear transactions. Investment banks are often direct members of CCPs, meaning that they are able to clear transactions with other members, but they also facilitate their customers’ access to CCPs through client clearing arrangements. These customers may not be eligible to join a CCP directly — or find the cost of joining prohibitively expensive — but nonetheless require access to central clearing to trade in financial markets. Financial institutions rely heavily on investment banks to provide these infrastructure services. In terms of the payments infrastructure, large banking groups often facilitate

electronic payments for their retail customers, or for smaller banks, but typically do not offer these services through their investment banking operations.

Table B shows a list of services provided by investment banks, as described above, alongside clients that frequently make use of these services.

Table B Investment banks’ activities and their clients

Investment bank activity	Clients
Underwriting and book building	Non-financial companies (mostly large ones) Government agencies Retail banks and other financial institutions
Trading in securities	Insurance companies Pension funds Asset managers such as hedge funds
Derivative trading	Non-financial companies Retail banks Asset managers such as hedge funds Insurance companies
Securitisation of loans	Retail banks Finance companies
Providing access to financial market infrastructure	Asset managers
Facilitating securities financing transactions	Asset managers (some of which act on behalf of pension funds and insurance companies)
Proprietary trading	–

Linkages to the real economy and the financial system

This section outlines how investment banks interact with agents in the real economy and the financial system and estimates the importance of different channels of service provision. It then explains how the provision of these services globally has changed in the years since the financial crisis.

Investment banks can contribute to the real economy in two ways. First, they can provide core financial services directly to companies and government agencies. And second, they can provide services to other financial institutions, which in turn provide core services to households, companies and public sector organisations. **Figure 1** illustrates these two channels.

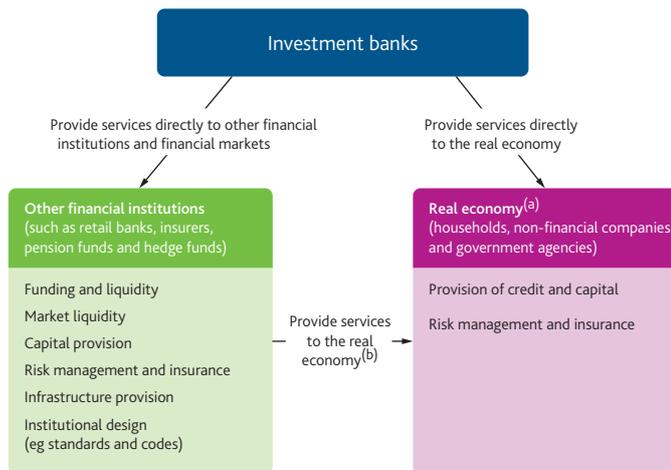
To understand the relative importance of these channels of service provision, it is helpful to be familiar with the structure of an investment bank. This varies across investment banks

(1) Although banks have closed many of their desks dedicated to proprietary trading, it is technically possible for traders on market-making desks to enter into these types of trades too.

(2) See Dive *et al* (2011) for a fuller explanation of the role of securities lending in supporting financial markets.

(3) Short-selling is used in a number of trading strategies. For example, an investor may think that an equity is overvalued and expects its price to fall. The investor would borrow and then sell the equity, with a view to buying it back later at a lower price, in order to make a profit from the price difference.

(4) See Nixon and Rehlon (2013) for a fuller explanation of how CCPs work and why they matter for the financial system.

Figure 1 Channels of service provision to the real economy

(a) Investment banks typically do not provide services to households directly.

(b) In addition to those listed in the purple box, other financial institutions also provide other services (such as payment services).

and can be complex, but at a broad level, investment banks are generally organised into three major divisions:

- (i) **Underwriting and advisory services** (or corporate finance), which helps companies and government agencies to raise finance through the issuance of equities or bonds in primary capital markets. It also provides advisory services, for example on mergers and acquisitions.
- (ii) **Sales and trading in equities**, which engages in trading activities in secondary markets in equities and related derivative instruments.⁽¹⁾
- (iii) **Sales and trading in fixed income, currencies and commodities (FICC)**, which engages in trading activities in secondary markets in bonds, foreign currency, commodities and related derivative instruments.

The sales and trading divisions are typically organised into 'desks', each of which trades financial instruments in a particular asset class. These operations can include market-making desks whose activities are aimed at clients and proprietary trading desks. Further information on the organisation of investment banks is available in Annex 2.

To quantify the relative importance of the service provision channels illustrated in Figure 1, one can look at the revenues that each sub-division generates, through fees (such as advisory and clearing fees) and bid-offer spreads,⁽²⁾ but also through interest on lending and securities financing activities. Figure 2 shows the revenues earned globally by sub-divisions of the major investment banks in 2013, and an estimated split of these revenues between what has been generated by serving agents in the real economy directly versus revenue from serving other financial institutions. It should be noted

that there is no direct mapping from revenues to the channels of service provision depicted in Figure 1. For example, while not estimated in this analysis, ideally when quantifying the benefits to the real economy of facilitating the issuance of a corporate bond, say, one would want to capture 'second-round' effects relating to the chain of expenditures that followed on from the issuance of the bond. In addition, not all sources of revenue shown in Figure 2 link directly to any one of the channels depicted in Figure 1.⁽³⁾ Even so, these data can give a broad sense of relative levels of service provision to the real economy — both directly and via the financial system.

This analysis suggests that, at a global level, investment banks contribute to the real economy mostly through the indirect channel of supporting the financial system. This is especially true in the sales and trading business — both in equities and FICC — where revenues are generated overwhelmingly through serving financial clients. Even in foreign exchange trading, which often serves non-financial companies seeking to hedge foreign currency risks, less than a quarter of revenue was estimated to have been generated by dealing with non-financial firms in 2013.

In contrast to sales and trading, the underwriting and advisory business mostly serves non-financial companies and government agencies directly. Around two thirds of the global revenues generated from issuances of shares and bonds were from clients outside the financial sector. And over 90% of advisory fees were generated from non-financial companies.

Global revenue data also offer an insight into the relative sizes of those operations. At an aggregate level, investment banks generate most of their global revenues through sales and trading, particularly through FICC. In 2013, FICC accounted for over half of total revenue, although revenues vary considerably each year. Of course, the distribution of revenues across divisions can differ considerably between investment banks, depending on the business model employed. For example, some investment banks may focus on particular asset classes, such as equities.

Investment banking services in recent years

The recent financial crisis has had a lasting effect on investment banks' trading activities. Most major global investment banks restructured their businesses as a result of their large losses during the crisis — in 2008 alone, aggregate trading losses in the UK banking system were over £30 billion — and regulatory measures taken after the crisis to make them less risky. By far the most significant shift has been in their trading operations.

(1) This division usually also provides ancillary services such as research.

(2) See Annex 1 on market-making for an explanation of the bid-offer spread.

(3) Revenues are not a perfect proxy for levels of activity as they can also be affected by changes in market prices.

Figure 2 Global revenues at large investment banks in 2013

This figure shows the revenues earned globally by ten of the largest investment banks in 2013.^(a) The data are split across the various investment banking sub-divisions. It also estimates the split between revenues generated by serving agents in the real economy directly versus revenues generated by serving other financial institutions.^(b)

- Estimated share of revenue from service provision to the financial system
- Estimated share of revenue from direct service provision to the real economy
- No breakdown of revenue possible

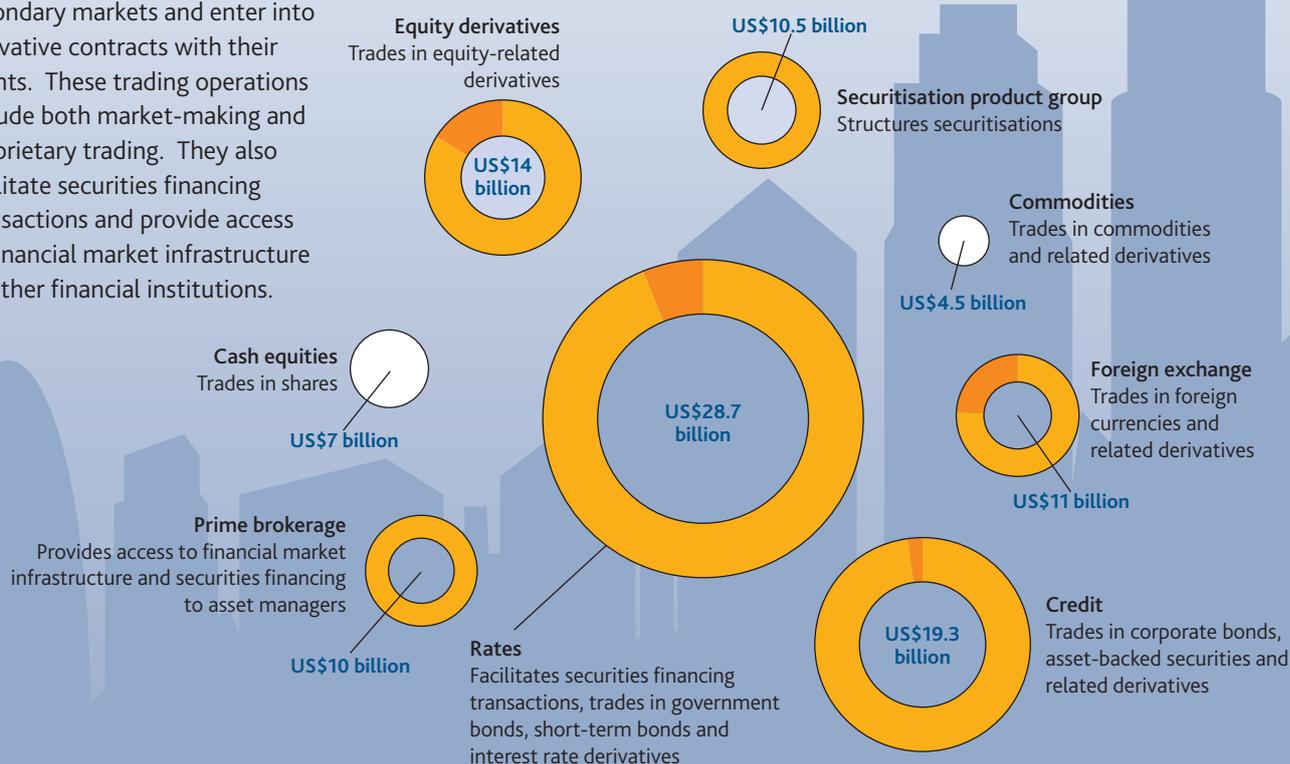
Underwriting and advisory

This division facilitates the issuance of shares and bonds by companies and government agencies through underwriting and book-building services. It also provides advisory services to companies.



Sales and trading

The sales and trading 'desks' buy and sell shares and bonds in secondary markets and enter into derivative contracts with their clients. These trading operations include both market-making and proprietary trading. They also facilitate securities financing transactions and provide access to financial market infrastructure to other financial institutions.



Overall revenues: around US\$140 billion

Around three quarters of this is estimated to come from service provision to the financial system, the remainder coming from direct service provision to the real economy.

Sources: Bank for International Settlements, Coalition, Dealogic, Thomson Reuters and Bank calculations.

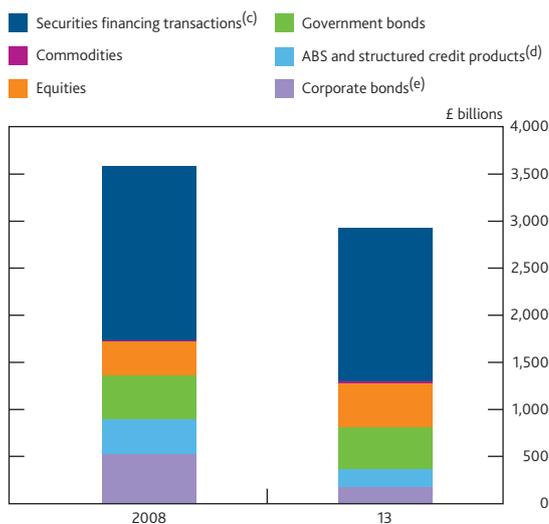
(a) Large investment banks as defined by Coalition. These are Bank of America Merrill Lynch, Barclays, BNP Paribas, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, JPMorgan, Morgan Stanley and UBS.

(b) Estimates of the proportion of revenue generated from the real economy and financial system for the underwriting and advisory businesses are from industry breakdowns of fees (non-financial and financial). For the sales and trading businesses, they are from derivative counterparties (non-financial and financial, excluding other investment banks). An assumption implicit in these estimates is that trading desks have the same client split for non-derivatives trading as for derivatives trading. 'Prime brokerage' and 'Securitisation product group' provide services to asset managers and lenders respectively, and therefore are assumed to generate all revenues through the financial system.

Secondary trading, derivatives and securities financing transactions

Chart 1, which compares trading-related assets at the peak of the crisis in 2008 to their 2013 levels, suggests that investment banks became less willing to hold large trading inventories in corporate bonds and securitised assets to facilitate trading. The amount of debt securities — corporate bonds, government bonds and securitised assets — held by the major global investment banks fell by over 40% during this period. Lower inventories, in turn, may have contributed to lower market liquidity after the crisis. In part, this may be due to a reduction in investment banks' risk appetite, although regulatory factors, such as higher capital requirements, may also have increased the cost of holding an inventory. But regulation has also improved investment banks' resilience, and this may result in them being a more stable source of liquidity.⁽¹⁾ Taken together, investment banks also had smaller lending portfolios through securities financing transactions in aggregate in 2013 than they did in 2008.

Chart 1 Large global investment banks' estimated assets held for trading and securities financing transactions^{(a)(b)}

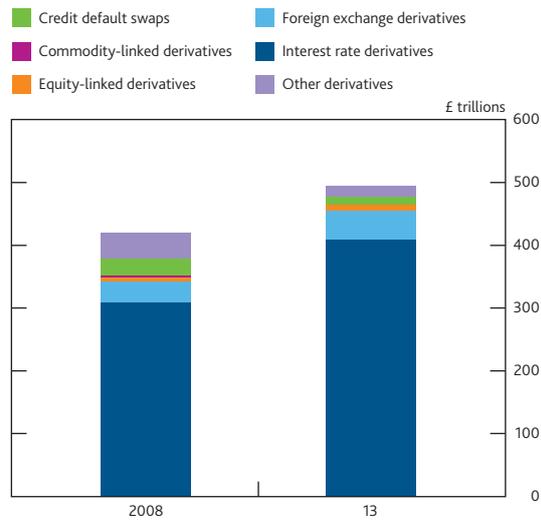


Sources: Published accounts and Bank calculations.

- (a) Sample as in Figure 2, with the addition of the Royal Bank of Scotland and exclusion of Deutsche Bank. 2008 data include assets held by investment banks that were acquired by these groups during the crisis.
- (b) Assets held for trading exclude derivatives.
- (c) Securities financing transaction assets are adjusted for differences in accounting standards between US and European banks. IFRS accounting standards are used for this chart.
- (d) Includes traded loans.
- (e) Includes money market instruments.

In contrast, activity in derivative markets has continued to grow since the crisis, albeit at a slower pace than it did prior to the crisis. **Chart 2** shows the aggregate notional amounts of open derivative trades — the face value used to calculate payments made on the derivative — outstanding at the end of 2008 and the end of 2013.⁽²⁾ It is impossible to know with certainty what has driven this increase, but it may be due to the long-term growth in the use of derivatives as they have become more popular for hedging risks. The rise could also reflect greater use of derivatives for speculative purposes. The notional values of derivatives have increased despite a recent

Chart 2 Notional values of banks' open derivative contracts^{(a)(b)}



Sources: Bank for International Settlements (BIS) and Bank calculations.

- (a) Amounts outstanding at end-2008 and end-2013.
- (b) Data from BIS exchange-traded derivatives statistics and surveys on OTC derivatives, available at www.bis.org/statistics/derstats.htm.

increase in the use of compression services, which cancel offsetting derivative trades, by investment banks.

Primary capital markets activity

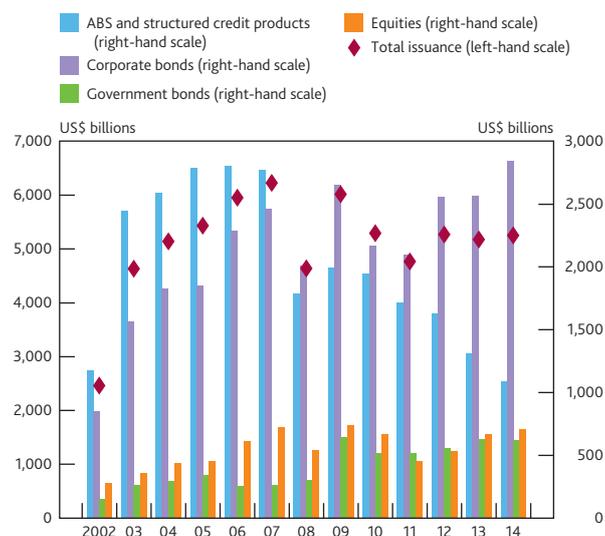
In contrast to their aggregate trading activities, investment banks' overall activity with respect to primary market issuance has remained high since the crisis. The red diamonds in **Chart 3** show that global investment banks facilitated the issuance of around US\$5.2 trillion worth of securities in 2014 — which was roughly the same amount as the average figure for the pre-crisis period from 2003–07.

That said, the aggregate figures mask notable changes in the composition of primary issuance in capital markets. For instance, post-crisis issuance of corporate bonds and government bonds has grown considerably. In the case of corporate bonds, this might reflect a tightening in credit conditions and a preference for debt financing among non-financial companies due to low global interest rates since the crisis. Levels of government borrowing, meanwhile, have risen as fiscal positions deteriorated following the global recession.

Issuance of ABS and structured credit products (more complex securitisations) has fallen since the crisis, however. Lower issuance of securitised products may be due to the stigma that investors have attached to these securities since the crisis,

- (1) See Section 3 and Box 4 of the Bank's December 2014 *Financial Stability Report* for more information on risks relating to market liquidity; www.bankofengland.co.uk/publications/Documents/fsr/2014/fsrfull1412.pdf.
- (2) Because payments on derivatives between counterparties are based on small percentages of the notional value, notional values are much larger than the values that banks hold on their balance sheets (which reflect the amounts that they are owed, or owe, on derivative contracts). But, unlike balance sheet values, notional values do not change as a result of movements in market prices, and therefore offer a better quantitative measure of activity levels.

Chart 3 Primary issuance facilitated by the large global investment banks^{(a)(b)}



Sources: Dealogic and Bank calculations.

- (a) Data show the proceeds of issuances where a major global investment bank is listed as one of the book runners. For ABS and structured credit products, proceeds exclude the value of tranches retained by issuers.
 (b) Sample as in Figure 2, with the addition of Royal Bank of Scotland. Pre-crisis data include issuance facilitated by investment banks that were acquired by these groups during the crisis.

together with alternative sources of cheap funding for banks, such as loans from central banks. A recent discussion paper by the Bank of England and the European Central Bank sets out proposals to revive securitisation markets by encouraging securitisation structures that are simple, transparent and robust.⁽¹⁾ A joint paper between the Basel Committee on Banking Standards (BCBS) and the International Organization of Securities Commissions (IOSCO) also sets out criteria to assist the financial industry's development of simple and transparent securitisation structures.⁽²⁾

Risks posed by investment banks and regulatory initiatives to minimise them

This section explains the risks that investment banks and their activities pose to the stability of the financial system. The International Monetary Fund, Bank for International Settlements (BIS) and Financial Stability Board have jointly developed a framework for assessing systemic risks in banking. This is the framework used for identifying global systemically important banks (G-SIBs). Some of the key factors from the framework — banks' **complexity**, their **interconnectedness**, their **size** and the **lack of readily available substitutes** or financial infrastructure for the services that they provide — are key determinants of risk and are considered below. While these are presented as separate factors, they often jointly explain the risks that manifest themselves in practice.

Many of the risks that investment banks' activities pose crystallised during the recent crisis.⁽³⁾ This led to severe solvency and liquidity problems for the investment banks themselves, but also knock-on effects for the markets in which

they operated and other parts of the financial system and the economy more broadly.⁽⁴⁾ Regulatory initiatives that have been introduced in response to the crisis in order to reduce these risks are summarised at the end of the section.

(i) Complexity

Investment banking activities can be complex. The three indicators used in the G-SIB framework to measure complexity — the notional amounts of derivatives traded 'over the counter' (that is, off-exchange), the value of assets held that are difficult to price due to their illiquidity (so-called 'level 3' assets), and the total value of securities held — are all more heavily linked to investment banking activities than to retail banking services. For example, the fifteen largest investment banks in **Table A** account for nearly 90% of the notional amounts of all open derivative contracts globally, as measured by the BIS.

The recent financial crisis illustrated this complexity. Some investment banking products, particularly the more esoteric structured products, are difficult to price. The risks associated with holding some of these financial instruments can therefore be poorly understood. This can lead to periods in which these instruments are systematically mispriced, as happened with structured credit products, such as collateralised debt obligations (CDOs) prior to the crisis. These were widely considered to be low-risk instruments despite the low-quality ('sub-prime') loans that backed them.⁽⁵⁾ A CDO is a vehicle that invests into securities such as corporate bonds and ABS, and repackages them to issue related securities. Like ABS, CDOs have a tranche structure, with each tranche issuing an instrument with its own level of risk and return.

Several factors were behind the mispricing of CDOs. The ability of lenders to sell their loans to securitisation vehicles reduced their incentives to screen out less creditworthy borrowers when advancing loans, as the original lenders would not bear much of the ultimate losses. This created a wedge between the underlying quality of the securities and investors' perception of their riskiness. Moreover, the investment banks that facilitated the securitisation of these loans and sold them to investors systematically underestimated the riskiness of the underlying loans, partly because of the assumption that property prices would be unlikely to fall across all US states at the same time.⁽⁶⁾ Consequently, investment banks and investors took large write-downs on CDOs once US house

(1) See Bank of England and European Central Bank (2014).

(2) See Basel Committee on Banking Standards and International Organization of Securities Commissions (2014).

(3) See Gorton and Metrick (2012) for a fuller discussion on the crisis.

(4) For an introduction to bank solvency and liquidity crises and implications for the stability of the financial system, see Farag, Harland and Nixon (2013).

(5) This was particularly true of the senior 'AAA' tranches.

(6) Market participants relied heavily on credit rating agencies to provide credit ratings on these securities. Their models systematically underestimated the correlation between the performance of loans across the United States. See US Senate Permanent Subcommittee on Investigations (2011) for further details.

prices began to fall and it became apparent that CDOs had been considerably mispriced.⁽¹⁾

Investment banks can also create complexity in the system through some of their less transparent trading operations. This can include the operation of 'dark' trading venues (so-called 'dark pools'). These are private venues for trading securities. Participants trade anonymously so as not to reveal large orders that may move market prices against them in the open market, such as public exchanges. Investment banks can also trade in these dark venues, sometimes through arbitrage-seeking algorithms. They also use algorithms to match trades between market participants. The opacity of these systems and algorithms make it difficult for financial market participants and regulators to identify the risks that may arise from them. There may be risks to market liquidity from potential errors in algorithms, for example, and these risks may be exacerbated by the lack of transparency.

(ii) Interconnectedness

Interconnectedness in the financial system, for example through interbank lending, can create a channel for the transmission of losses between financial institutions, including investment banks. The most direct channel of contagion is 'counterparty credit risk' — the risk that insolvent institutions cannot repay their debts and thus impose losses on other institutions to whom they have outstanding obligations. Investment banking activities such as derivative trading and securities financing transactions can create large intra-financial exposures. For example, in June 2014, over 80% of investment banks' global derivative exposures were to other financial institutions, including 40% to other investment banks. These exposures are typically collateralised, however, and this significantly reduces the risk of a direct loss from the failure of a counterparty.

But problems can nonetheless arise through other channels of contagion, such as market liquidity effects. Faced with a severe shock, market participants may withdraw from financial markets, which can impair functioning, and further amplify the shock. This mechanism was evident during the crisis. Credit losses from sub-prime loans generated enough uncertainty among financial market participants to impair wholesale funding markets, which many institutions — including investment banks — relied on for funding. Severe stress in these markets put liquidity pressure on investment banks, particularly since investors were wary of lending to institutions that may have held sub-prime securities. The combination of credit losses from sub-prime loans coupled with low levels of capital and difficulty in accessing funding markets caused some investment banks to fail.

Contagion also arises via market channels because of the procyclical nature of collateralised transactions. Consider, for instance, a scenario in which asset prices — and hence

collateral values — are falling. In response to such conditions, investment banks may be forced to post additional collateral to a counterparty to cover minimum 'margin' requirements (collateral requirements to cover exposures on outstanding trades), and may use up their reserves of cash or liquid assets in doing so. In volatile trading conditions, this could be compounded by market participants increasing their minimum margin requirements. Given the size of investment banks' derivative and securities financing transaction exposures as a proportion of their balance sheet, this interconnectedness channel can represent a material risk to their viability.⁽²⁾

The procyclical nature of collateralisation creates risk in the financial system beyond the distress or failure of investment banks. In the above scenario, falling collateral values may force investment banks to make margin calls, that is, to collect additional collateral from their counterparties. In this situation, their actions to reduce their own risks may cause their counterparties to sell off some of their assets in order to be able to post collateral. A fire sale of assets by counterparties on a large scale could cause a sharp dislocation in asset prices. This would in turn affect other institutions, which may themselves be using these assets as collateral to access funding.⁽³⁾

(iii) Size and substitutability

Investment banks' trading functions tend to operate on a large scale. This is partly because there are network and information economies of scale to providing market-making services. Those banks with many clients can more easily source securities that are sought after by investors. They can also find offsetting trades more easily by matching clients up with each other. Large providers of liquidity can also observe trade flows. This helps them to anticipate client trades and adjust their inventories, and manage their risks accordingly. For these reasons, investment banks often run very large trading operations.

This can pose risks to the financial system, however, since it can mean that market liquidity is concentrated in just a few big banks. A sudden withdrawal of any major investment bank's market-making services, due to its distress or failure, could cause the financial markets that it operates in to function less effectively.⁽⁴⁾ Substantial shares of these markets are based in the United Kingdom: 70% of global trading in international bonds, for instance, and nearly half of all interest rate derivatives traded over the counter (OTC).

(1) Alongside the potential for large losses, complex instruments can introduce more uncertainty in the system about asset valuation. This can cause market participants to retrench and consequently reduce market liquidity.

(2) Of course, to some extent, this risk would be mitigated by the fact that an investment bank will also receive margin from counterparties on transactions where it is owed money.

(3) See Stein (2013) for a discussion of the economics of fire sales in securities financing transactions.

(4) See Duffie (2010) for more information on the consequences of the failure of a large investment bank.

The bankruptcy of Lehman Brothers — a US investment bank with large trading activities — in September 2008 offered an example of how this risk can materialise. After the bankruptcy was filed, Lehman's counterparties largely closed out their derivative positions where they were 'in-the-money', that is, where Lehman owed them. By doing this, they retained the collateral which Lehman had posted, which they subsequently sold off. The simultaneous sell-off of these assets depressed market prices. Although numerous factors were at play at the height of the crisis, the mass sell-off of collateral is thought to be one of the contributing factors to the market dislocations which followed the failure of the investment bank. Closing out derivative positions was not a straightforward process. Disputes about amounts owed — largely due to difficulties in agreeing prices in illiquid markets — led to delays in the process, which may have exacerbated the deterioration in market functioning.⁽¹⁾ In addition, the failure of Lehman Brothers contributed to uncertainty in financial markets about the creditworthiness of counterparties. This led many participants to retrench their activities significantly. While the scale of the investment bank contributed to the market dislocation, factors such as the interconnectedness of institutions through financial markets were also relevant.

This concentration of market activity in a few institutions also opens up the possibility of market manipulation. In recent years, many investment banks have been investigated in relation to alleged or actual acts of misconduct relating to their trading activities. Such manipulation erodes trust in financial markets and discourages investors from participating in them. In light of these findings, the Bank is conducting a review on the fairness and effectiveness of markets, jointly with HM Treasury and the FCA.⁽²⁾ The FCA also recently announced a separate review into competition and pricing practices in investment banking.⁽³⁾

The failure of a large investment bank can also cause widespread financial instability because of its importance to financial market infrastructure. For instance, if an investment bank became insolvent, the removal of its clearing services would require all financial institutions that had been reliant on the investment bank to migrate to another provider. These institutions would be unable to trade in financial markets in the interim. An insolvent investment bank could also impose losses on CCPs if the collateral that it posted did not cover money owed through its open positions. Losses would then be passed on to other financial institutions that were members of the CCPs in question.⁽⁴⁾ Large, system-wide losses and multiple bank failures could threaten the solvency of CCPs which, given their systemic importance, would have very significant spillovers for the rest of the financial system.⁽⁵⁾ In the United Kingdom, the Bank of England is responsible for the supervision of CCPs and for their resolution in the event of failure.

Risks can also arise because of the size of some investment banks' holdings of their clients' assets through their prime brokerage services.⁽⁶⁾ In the event of the failure of an investment bank with large prime brokerage and repo operations, unwinding these collateralised transactions and returning assets to clients can be time consuming and disorderly. Again, this was demonstrated by the failure of Lehman Brothers in 2008. Prime brokerage customers could not access their assets if they were not in a segregated account, and were unable to recover the value of these assets immediately if Lehman had lent them out or used them as collateral in a separate transaction. The situation was exacerbated by the failure of Lehman's European subsidiary to comply with the Financial Services Authority's rules on client assets. At the end of 2014, Lehman's European subsidiary had still not returned all of its clients' assets. New rules on client assets have now reduced this risk.⁽⁷⁾ But the inability of Lehman's clients to access these assets undermined their liquidity positions and in some cases threatened their solvency. In particular, highly levered firms, such as hedge funds, faced difficulties in exiting their loss-making positions.

Regulatory reforms

The systemic importance of large banking groups with investment banking operations has been widely recognised by various regulatory initiatives since the recent crisis. In the immediate aftermath of the crisis, G20 countries committed to a fundamental reform of the financial system, co-ordinated by the FSB. Many of the policy reforms being led by the FSB — improving the resilience of financial institutions, ending 'too big to fail', and reforming OTC derivative markets — are directly relevant to investment banks.⁽⁸⁾ In the United Kingdom, post-crisis reform included the creation of the Prudential Regulation Authority and the Financial Policy Committee at the Bank of England. The rest of this section summarises some of the key regulatory reforms aimed at mitigating the risks discussed above. A box entitled 'Regulatory changes and investment banks' expands on this topic.

A major focus of the regulatory reforms has been the resilience of banking groups, including those with large investment banks, to shocks. For example, internationally agreed standards set by the Basel Committee on Banking

(1) See Fleming and Sarkar (2014) for a detailed description of the failure resolution of Lehman Brothers.

(2) For more information on the Fair and Effective Markets Review, see www.bankofengland.co.uk/publications/Pages/news/2014/140.aspx.

(3) See www.fca.org.uk/news/fca-to-investigate-competition-in-investment-and-corporate-banking-services-following-review-of-wholesale-markets.

(4) Clearing members are required to contribute to default funds, which are drawn on in the event of material losses at the CCP.

(5) See Nixon and Rehlon (2013).

(6) See Annex 2 for a description of the activities typically undertaken by the prime brokerage operation.

(7) For example, in the United Kingdom, prime brokers are now required to report details on client assets regularly to their clients. And the return of client assets in resolution has been facilitated by the introduction of the Special Administration Regime. See Gracie, Chennells and Menary (2014).

(8) See Financial Stability Board (2014a) for more information on FSB-led reforms.

Standards (BCBS) around banks' capital resources have been enhanced, especially for the most systemically important banks. New requirements to hold liquid assets to meet potential outflows have also been introduced. Together, these reforms have improved banking groups' ability to absorb losses and to withstand a sudden outflow of funding — factors which caused some of them to fail during the recent crisis.

Regulatory initiatives since the crisis have also sought to improve the resolvability of banking groups, including those with investment banks, in order to ensure that large banks can fail in a more orderly manner without systemic consequences and without recourse to public funds. This was not possible during the crisis. Some distressed investment banks such as Merrill Lynch and Bear Stearns were subsumed by other banks. But universal banks such as Citigroup, Royal Bank of Scotland and UBS had to be offered state support. Since then, cross-border efforts have been made through the FSB to develop resolution plans in the case of the failure of a G-SIB. Several countries, including the United Kingdom, have implemented legislation to introduce resolution regimes for dealing with the failure of financial institutions without requiring the use of public funds.⁽¹⁾ In the United Kingdom, the Bank of England now has legal powers to resolve banks and investment firms.⁽²⁾

The structures of financial markets and banking groups have undergone reform, too. Higher standards of transparency and reporting were introduced in financial markets, so that risks arising in these markets could be observed and dealt with by regulators. Rules mandating investment banks to clear their derivative trades via CCPs, rather than bilaterally, have reduced interconnectedness in the banking sector and the associated risks. In the United States, the Volcker Rule has prevented banking groups from undertaking proprietary trading activities.⁽³⁾ In the United Kingdom, legislation has been passed to ring-fence banking groups' core retail banking activities from their investment banking activities.⁽⁴⁾ This aims to protect the provision of core retail banking services to the economy from risks associated with global investment

banking. Incentives for investment banks to manage their risks properly have also been addressed through pay structures and changes to securitisation requirements.

Conclusion

The largest investment banks globally are part of major banking groups. They operate in several countries, including the United Kingdom, where they provide services that are important to the real economy and the financial system. Their services are important to companies that seek finance through the issuance of bonds and equity to investors. They also intermediate in secondary financial markets and allow financial and non-financial companies to manage their risks and their assets by doing so. These activities can contribute to the efficient functioning of financial markets which support the real economy. Investment banks also play a major role in the provision of financial infrastructure.

But these activities are also associated with risk. Globally, investment banks are large providers of critical services to the rest of the financial system. The distress or failure of an investment bank can have a large systemic impact. It could also lead to contagion to the rest of the financial system due to the highly interconnected nature of their services. The complexity of investment banks' operations also contributes significantly to risks in the global financial system.

A number of regulatory initiatives globally have been implemented since the onset of the global financial crisis to correct the fault lines that contributed to it and to build a safer, more resilient financial system. The agreement of these standards for banks is substantially complete, but further work is required to ensure that they are implemented fully, to monitor new risks, build mutual trust and further facilitate international co-operation. The Bank of England has a key role to play in working with other regulatory bodies globally to fully implement these measures and ensure that investment banking activities are conducted in a way that is safe and sound.

(1) In the United Kingdom, legislation has been introduced through the Banking Act 2009, the Financial Services (Banking Reform) Act 2013 and the Bank Recovery and Resolution Order 2014.

(2) See Gracie, Chennells and Menary (2014) for more on the Bank of England's approach to resolving failed institutions.

(3) See www.federalreserve.gov/bankinforeg/volcker-rule/default.htm for more details.

(4) See www.gov.uk/government/news/banking-reform-act-becomes-law for more details.

Regulatory changes and investment banks

This box provides an overview — but not an exhaustive list — of some of the regulatory changes that were introduced after the crisis to minimise the risks from investment banking activities, and from the large banking groups which provide them. Three broad classes of regulatory reforms are discussed: improvements in bank resilience; resolution of bank failure; and structural changes to financial markets and banking groups.

Improving bank resilience

After the financial crisis, the BCBS developed an internationally agreed package of reform measures, known as 'Basel III', to strengthen the resilience of the banking sector.⁽¹⁾ This package included requirements for banks to have larger reserves of capital to absorb losses, as well as liquid assets to meet potential outflows. For globally systemic banks, capital requirements are more than ten times higher than pre-crisis standards. These measures have improved the resilience of investment banks that operate in a banking group. For example, market risk⁽²⁾ now attracts larger capital requirements for banking groups. This is particularly relevant for investment banks. Banking groups are also required to have more capital reserves against securitised instruments and derivative exposures. The BCBS is considering further changes to the treatment of the trading book for regulatory purposes to further strengthen the regime. In addition to these changes, the enhanced capital framework has also recognised the systemic importance of large banking groups, and placed higher capital requirements on them.

Together with these capital measures, the BCBS agreed requirements on liquid assets that banks will have to hold to meet potential outflows as a result of a shock. This 'liquidity coverage ratio' aims to mitigate the risks that banking groups — including those with investment banking operations — face liquidity problems in adverse market conditions, when wholesale funding markets may become impaired, as they did during the crisis.⁽³⁾

In the United Kingdom, the PRA ensures that banking groups — including those with investment banking operations — meet these rules, and that they adopt a risk appetite that is consistent with the PRA's objective to promote the safety and soundness of the firms it regulates. Firms' adherence to their risk appetite is monitored by drawing together various evidence: for the higher-impact banks, for instance, supervisors conduct reviews, including on-site, of risk and risk controls in a particular area of business. They also undertake analysis of business models, based on internal data and interviews with management, in order to understand how banks seek to make money — including reliance on income from their proprietary trading operations.

Resolution of bank failure

The introduction of legal powers to resolve banks and investment firms, together with efforts to co-ordinate plans for the failure of global banks between regulators, have improved the resolvability of investment banks. In the United Kingdom, the Special Resolution Regime was introduced in 2009 to give the Bank of England and HM Treasury legal powers to resolve banks in an orderly way. These powers were subsequently strengthened and widened in scope. In November 2014, the FSB published a proposal to require G-SIBs to hold adequate amounts of loss-absorbing equity and debt instruments to facilitate their resolution in the event of failure.⁽⁴⁾ This will help resolution authorities, including the Bank of England, to resolve large banking groups without using public funds.

In addition, new derivative protocols developed by the International Swaps and Derivatives Association (ISDA) and agreed by major banks will help the resolution of failed investment banks with large derivative trading operations. The new protocol includes a provision for a temporary suspension of the right to close out derivative contracts for counterparties of a bank that is in resolution proceedings.⁽⁵⁾ This should help to avoid a repeat of the mass close-out of derivatives and sell-off of collateral seen after the failure of Lehman Brothers, and the associated market dislocation.

Structural reforms in financial markets

Alongside structural reforms such as the Volcker Rule (discussed in the main text of the article) and ring-fencing measures imposed on banking groups, post-crisis regulatory work has also focused on structural issues in the financial system. This has included measures to reduce the risks caused by the interconnected nature of the banking system. In the EU, the European Market Infrastructure Regulation (EMIR) mandates investment banks to clear their OTC derivative trades with CCPs, rather than bilaterally.⁽⁶⁾ Investment banks have also made greater use of trade compression services that allow them to cancel their offsetting derivative trades, thus reducing their gross exposures. These changes have resulted in a less interconnected banking sector, where investment banks have exposures with CCPs, rather than each other. CCPs have themselves improved their risk management standards through tougher margining requirements. The risk of

(1) For more information about Basel III, see www.bis.org/bcbs/basel3.htm.

(2) Market risk is the risk of losses in positions arising from movements in market prices. This is further explained in Annex 1.

(3) See Bank of England (2014b) for more information. Another regulatory measure introduced by the BCBS was the Net Stable Funding Ratio (NSFR), which requires banks to maintain a stable funding profile in relation to the composition of their assets.

(4) See Financial Stability Board (2014b) for a consultative document on total loss-absorbing capacity.

(5) For more information, see www2.isda.org/news/major-banks-agree-to-sign-isda-resolution-stay-protocol.

(6) See www.fca.org.uk/firms/markets/international-markets/emir for an overview of EMIR.

investment banks taking credit losses from each other should therefore diminish materially, but liquidity risks from margining will remain and risk in the financial system will be concentrated in CCPs. In the United Kingdom, resolution tools have been introduced to allow the Bank of England to resolve failed CCPs in an orderly manner while providing continuity of critical services.⁽¹⁾

Reforms to financial markets have not been limited to clearing. Trading in securities and derivatives has been made more transparent and open. For example, in both Europe and the United States, legislation has been passed to transfer the trading of standardised derivative contracts to exchanges or electronic platforms. In addition, reforms were agreed in Europe to limit trading in dark pools. Investment banks also have to report their trades to trade repositories.⁽²⁾

In the United States and the EU, regulation has addressed the poor incentives that lenders had prior to the crisis to adequately assess the risks associated with a loan that is due to be securitised. Legislation now requires banks that securitise their loans to hold a proportion of the securitised

products on their own balance sheet such that they retain a material economic interest in the instruments that are issued to investors.⁽³⁾

Finally, post-crisis reforms are improving the incentives of senior management at banks to manage risks appropriately. This is being done by promoting practices such as the introduction of 'malus' and 'clawbacks', which enable banks to reduce or claim back bonuses awarded to staff if it subsequently becomes apparent, even some years later, that excessive risk was taken or there was a failure of risk management.⁽⁴⁾ This is particularly relevant for investment banks, where a large proportion of remuneration has been in the form of variable pay.

(1) See Bailey (2014) for more information.

(2) In the United States, this has been done by mandating the use of regulated swap execution facilities (SEFs). In the EU, the Markets in Financial Instruments Directive II (MiFID II) has made changes to market structure and reporting requirements.

(3) Both the Dodd-Frank Act in the United States and the Capital Requirements Regulation (CRR) in the European Union mandate the original lender to retain 5% of the value of the assets that have been securitised.

(4) See Bank of England (2014c) for a policy statement on clawbacks.

Annex 1

Market-making at an investment bank

Market makers provide a market for investors to trade in by standing ready to buy and sell financial instruments continuously. They buy financial instruments at a 'bid' price and sell them at a higher 'offer' price, thereby allowing them to make a profit from the bid-offer spread on each transaction. These market-making activities are often referred to as **dealing**, which is why investment banks are sometimes called 'dealer banks'.

When making markets in securities such as equities or bonds, an investment bank will acquire and sell the securities in this way. For example, if a pension fund approaches an investment bank because it wants to sell UK government bonds, the appropriate desk will buy them at the 'bid' price.

Market-making desks do not generally want to run significant **market risk**, which is the risk of losses in positions arising from movements in market prices.⁽¹⁾ Consequently, the desk will aim to sell the government bonds relatively quickly, but it may be left with some bonds on its books temporarily. A by-product of trading is therefore that the investment bank holds an **inventory**.

If a client approaches the investment bank to buy a security, the security may be available from its inventory. If it is not, the appropriate desk will have to source the security from other financial institutions that hold them. It can do this by buying the securities or borrowing them in return for other securities or cash.

Making markets in derivative instruments is different. A **derivative instrument** (or 'derivative') is a contract between two counterparties that derives its value from the value of an underlying entity. The underlying entity can be a security such as a share or a bond, a physical asset such as gold, an index of securities or other assets, an interest rate or an exchange rate. The underlying entity is often called just the 'underlying'. Some common variants of derivative contracts are:

- (i) **Forwards and futures:**⁽²⁾ these are contracts between two parties to buy or sell an asset or enter a transaction at a future date at a price specified today.
- (ii) **Options and warrants:** these are contracts that give the owner the right, but not the obligation, to buy or sell an underlying security at a pre-determined price, sometimes on a specific date.
- (iii) **Swaps:** these are contracts between two counterparties to exchange cash flows over a period of time or on a specific date based on the underlying value of exchange rates, interest rates or securities or other assets. Two types of swaps are particularly common: (a) interest rate swaps where cash flows are based on an agreed fixed interest rate versus a variable or 'floating' interest rate and (b) currency swaps where two counterparties exchange aspects (principal and interest payments) of a loan in one currency for equivalent aspects of a loan in another currency.

When trading in derivatives, investment banks need to stand ready to write a contract for a client at the appropriate price. Like with securities, the price will include a margin so that the investment bank can make a profit on its trades.

Dealing in derivatives also gives rise to significant market risk, such as the risk of the value of the underlying entity moving such that the bank stands to make a loss on the trade (known as the trade being 'out-of-the-money'). Like with securities, the market-making desks will attempt to neutralise the market risk by entering into an opposite trade so as only to profit from the bid-offer spread without running too much risk. They can also do this by assessing the risks that they run on an entire portfolio at an aggregate level and enter derivative trades to minimise those risks (this is known as '**portfolio hedging**'). They often enter these trades with other investment banks, often via an **inter-dealer broker**. However, entering into many hedging trades may be costly, and may erode the bid-offer spread. Traders therefore need to carefully balance the costs and risks of trading in securities and derivatives against the rewards.

Trading in derivatives also opens investment banks to counterparty credit risk — the risk that their clients who are out-of-the-money do not pay the investment bank the money that they owe when it falls due at the end of the contract, for example due to insolvency or liquidity problems. This risk is typically managed through margining requirements.

(1) In this particular example, the investment bank runs the risk that the bonds held reduce in value.

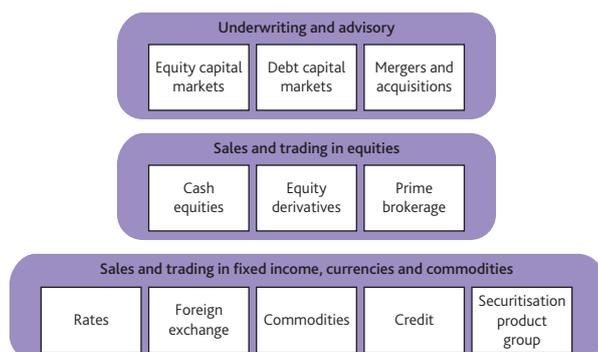
(2) Futures are forward contracts that are standardised and are traded on a centralised exchange.

Annex 2

The organisation of an investment bank

A stylised organisational structure of an investment bank is illustrated in **Figure A1**. This annex provides more information on the activities of the sub-divisions shown below.

Figure A1 Organisational structure of an investment bank



The 'underwriting and advisory' part of the investment bank is usually structured in three sub-divisions. **Equity capital markets (ECM)** and **debt capital markets (DCM)** are divisions that facilitate the issuance of equity and debt securities respectively for their clients seeking to raise finance. For large deals, an investment bank may form a 'syndicate' with other investment banks to share the risks of facilitating the transaction. The third sub-division is the advisory division, often referred to as **mergers and acquisitions (M&A)**. This part of the investment bank offers legal and financial expertise to firms engaging in mergers or acquisitions. Investment banks earn fees on each of these activities.

Investment banks' sales and trading activities — both in equities and in fixed income, currencies and commodities (FICC) — consist primarily of market-making activities in securities and derivative instruments, but can also include proprietary trading activities. Trading services are provided by 'desks' staffed by traders in the sales and trading divisions. The organisation of trading operations varies across investment banks, but it is usual to have a dedicated desk for each major asset class traded by the bank.

In sales and trading in equities, a '**cash equities**'⁽¹⁾ desk deals in straightforward equity securities. Although a large proportion of equity trading is done on dedicated exchanges such as the London Stock Exchange, investment banks play a role in equity markets by dealing with large investors such as pension funds and insurance companies. Large investors benefit from building relationships with investment banks by being offered the opportunity to buy shares in primary equity issuances. Although this link between the trading and underwriting arms exists, rules on 'insider dealing' forbid the traders to use information from the banks' underwriting or advisory business

to make gains. Investors are also offered ancillary services such as research on the performance of certain shares by the investment banks' analysts. By buying equities in large quantities from an investment bank (or selling to it), large investors can in theory keep their costs down by not disclosing their large orders to the market. This is sometimes achieved by trading in 'dark pools', which are private, anonymous exchanges set up by investment banks. Trading in derivative contracts linked to equities are provided by an '**equity derivatives**' desk.

Also within sales and trading in equities is a business known as **prime brokerage**⁽²⁾ or prime services. Primarily aimed at financial institutions such as hedge funds, prime brokerage businesses typically lend cash to institutions against collateral (this is known as margin lending). These institutions then use this cash to enter into further financial transactions that could earn returns. The investment bank earns interest on the cash that it lends, but can also supplement its revenues by lending the securities that it holds as collateral in securities lending markets.⁽³⁾ Investment banks also provide services that allow financial institutions to access financial market infrastructure to transact in financial instruments through prime brokerage.

Sales and trading in FICC houses trading desks that deal in other asset classes. The broad classes are:

- (i) '**rates**', where desks trade in sovereign debt securities, money market instruments (such as commercial paper — short-term bonds that companies use for funding purposes) and derivatives related to interest rate risk such as interest rate swaps. The 'rates' area of the investment bank sometimes includes desks that facilitate repos and securities lending transactions. Like market-making desks, these desks intermediate between market participants. They often do this by running a matched book business where they enter into securities financing transactions at their clients' request.⁽⁴⁾
- (ii) '**foreign exchange**', made up of desks that trade in foreign currencies and related derivatives.
- (iii) '**credit**', made up of desks that deal in corporate bonds (debt instruments issued by private corporations), ABS and structured credit products (more complex securitised instruments) and credit derivatives.

(1) 'Cash' refers to the fact that the desk trades securities and not derivative products.

(2) Although prime brokerage activities often sit in the equity trading part of major investment banks, prime brokers do not deal exclusively in equity products.

(3) This is known as rehypothecation.

(4) Consider, for example, a retail bank that approaches an investment bank to borrow cash in a repo transaction, using sovereign bonds as collateral. The relevant desk would complete the transaction, and charge the retail bank an interest rate. It would then lend out the bonds to another client against cash and make a return on the spread between the lending and borrowing rates. The desk's book is 'matched' because the investment bank lends out the securities that it borrows and *vice versa* (but not necessarily at the same maturity).

- (iv) '**commodities**', made up of desks that deal in commodities such as oil and precious metals and related derivatives.

Finally, another sub-division of FICC is the '**securitisation product group**'. This business securitises loans made by banks or other financial institutions and sells the securities to investors. The investment bank makes a return by charging a fee for its services or making a margin on the sale of securitisations to the investors relative to the value of the 'raw' loans.

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