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Banks: How they work and why they are fragile

Banks lie at the heart of financial systems. Without banking infrastructure in place, capital markets, insurance and asset managers could not function. The rapid growth of the non-bank parts of the financial system, including ‘shadow banks,’ had taken attention away from banks, but the financial crisis which has affected banking systems the world over has focussed minds once again on the centrality of banks.

The complexity of products such as Collateralized Debt Obligations (CDOs), the opaque nature of derivative securities, the risky nature of the shadow banking system and a host of other problems have been offered as the proximate causes for the financial crisis. Each of these lines of argument is valid to some extent, but that must not distract us from the truth that this not the first banking crisis more like the hundredth one. In the days before CDOs, complex derivatives and the shadow banking system existed we still had banking crises. So, while it is important to learn lessons specific to this crisis we must not lose sight of the broader picture which is that banking is a fragile business.

We have already discussed some of the factors that make the financial system unstable. The policy measures we use to improve our banking systems must tackle not just the general instability of the financial system, but also the fragility of banks in particular. The specific causes of the current crisis as well as the general evolution in banking practices over the past decades would also need to be kept in mind.

What do banks do and why are they so important?

The word ‘bank’ is used loosely and may include institutions which are very different from each other, such as 1) commercial banks 2) investment banks 3) development banks etc. But for the purpose of this book, and for most regulators, the word ‘bank’ evokes the image of some special functions. All ‘banks’ perform the following roles to some extent:

Maturity transformation

Banks accept deposits from savers, guarantee to return these on demand – and use these deposits to make loans for longer durations. In doing so, banks have the potential to transform short term savings into long term investments and thus improve the productivity of the economy. Savers want to be able to access their money at any time and investors want to get funds which are committed for a long term so they can make longer term

investments. By placing itself between the savers and investors the bank enables productivity enhancing investments to take place.

Credit creation

Banks use a system of fractional reserves where each \$100 deposit they get is split into 2 parts. One part – usually about \$10 stays in the bank as reserves in case the depositors want some of their money back at a short notice but \$90 is lent on to an individual or a business. This person in turn puts the loan money into his bank account where his bank holds on to \$9 and lends the \$81 residual to another customer and so on... This means that an initial \$100 of savings can be converted into a much larger amount of credit. This is crucial for oiling the wheels of the economy in various forms, for example, as trade credit or working capital. While individual banks cannot 'create credit' the banking system as a whole does exactly that.

Credit allocation

Demand for credit is often higher than even the amount that the amounts that this 'magic' of fractional reserve banking can create so banks have to ration credit. Even in the absence of such rationing banks have to be careful about whom they give credit to since giving loans is inherently risky.

The decision process behind this rationing typically involves asking questions such as

- a. What is the client is going to do with the money?
- b. What is the risk associated with this project?
- c. What is the projected return?
- d. What is the likelihood that the client will be able to return the money in full?

This due diligence is central to the long term success of modern day economies where banks and financial markets not governments play the de facto role of 'central planners'. So the quality of this decision on allocating credit is central to the dynamism of the overall economy.

The banking system also fulfils another central role in the economy, that of providing the payment and clearing infrastructure that the whole of the financial sector and indeed the rest of the economy depend on.

All of these services can broadly be grouped under the category of 'commercial banking.'

Increasingly, banks perform other functions in addition to the 'core' functions discussed here. Some of these additional functions are providing:

- A** Advisory services for the financial needs of businesses and individuals
- B** Transaction advisory services such as on mergers and acquisitions
- C** Brokerage services for stock market trading
- D** Capital market dealer services such as flotation in the stock market and market making
- E** Bank assurance services such as offering insurance and other financial products to customers
- F** Asset management services which involves investing client money

More recently, an increasing number of banks have been adding proprietary trading, where they trade in financial markets for profit on their own account, to the list of activities they carry out.

The more of these services banks combine the closer they move to the 'Universal Banking' model that is fairly dominant amongst the big European banks. In the United States the Glass Steagall act had enforced a legal separation between commercial banking and investment banking activities but its repeal in 1999 opened the doors for the growth of the Universal Bank model there.

Furthermore, the structure of banking has changed significantly in the past two decades. The size and scope of banks as well as the way they are run has changed almost beyond recognition.

The fragility of banks and redrawing the banking social contract

Banks, as several banking crisis throughout history have demonstrated, are fragile institutions. This is to a large extent unavoidable and is the direct result of the core functions they perform in the economy. In exchange for performing these core functions and in order to guard against inherent fragility, society has provided banks with several social insurance mechanisms which are also discussed briefly in this section.

Liquidity and Solvency risks

When banks convert short term deposits into long term loans, they expose themselves to the danger that many of their depositors may want their money back at the same time. But the bank, which is unable to call in loans it has made for long maturities, may not be able to pay. This maturity mismatch between the liabilities and assets of banks has been behind 'bank runs' where depositors panic and try and be the first ones to get their money out knowing the bank will not have sufficient liquid resources to return the money owed to all depositors.

To guard against this risk, banks were traditionally expected to maintain buffers in the form of minimum statutory liquidity and cash reserves though these have been abolished in recent decades. Thirty years ago, UK banks, for example, held as much as 30% of their assets in a liquid form but that figure had come down to less than 1% by 2007¹.

The second bulwark against this risk is the central bank liquidity window which provides liquidity in the form of loans to solvent banks when they face a temporary shortage of funds.

The current crisis has seen a massive expansion of the size and scope of such liquidity windows as central banks the world over have provided trillions of dollars in liquidity support to their banking systems.

While fractional reserve banking is very effective at creating credit the fact that each bank retains only a fraction of the deposits and lends the rest makes banks very susceptible to the risk that borrowers may not be able to repay the loans they took out. Depositors may want their money back but the borrowers may not be able or willing to repay the money owed to the bank.

¹ Statistics from the Bank of England

Knowing that not all loans will be repaid and that each bank will face idiosyncratic losses on its loans, regulators have expected banks to maintain minimum capital buffers. It is expected that these and the provisions that banks are expected to make against likely losses are sufficient to absorb losses so depositors do not lose money.

Faced with an uncertainty whether a bank will 1) be liquid enough or 2) solvent enough to return their money when they seek it, depositors are susceptible to panic withdrawals at the slightest hint of trouble. These runs have a self-fulfilling nature where the run itself can drive even a sound bank into trouble.

It is to guard against this panic that regulators in most countries now provide deposit insurance facilities which guarantee the return of all bank deposits under a ceiling amount. Typically this insurance is funded by a fee on all bank deposits and is guaranteed by the central government.

Bank profits and banker bonuses

This leads to the next issue of debate – the bonus culture endemic to banks and other financial institutions. The present financial and economic crisis was caused by excessive risk taking by a very wide variety of firms in the financial sector. Investment banks, banks, hedge funds were all involved not just in building up excessive risks at the level of individual firms but even more so in the aggregate build up of systemic risk.

The decisions to take on these risks were driven by the boards and CEOs who ran these firms and the employees who worked for them. Their motivation for doing this was simple:

- The higher the risks a firm takes, the greater the profitability is likely to be
- The greater the profitability of a firm, the greater the compensation paid.

Much of the excessive risk taking by financial firms was driven by the desire of its management and employees to maximise their personal wealth.

For partly historical reasons to do with investment banks having had partnership structures until recently, employees at major investment banks typically distribute more than 50% of the revenues of the firm amongst themselves so the link from higher profitability of the firm to higher bonuses for employees is very direct.

How banks generated their returns

In order to maximise bonuses, it is not sufficient of course for employees to simply want this to happen. The employees need to run the financial firms they work for in a way that would generate very high profits that will in turn enable them to take home 50% of these profits as bonus and compensation. So it is important to look at what sort of strategies financial firms followed to earn the very high profits that were reported.

Most of the strategies of earning excessive profits followed in the financial sector flowed from excessive risk taking as we demonstrate below.

Taking on excessive leverage

As long as the rate of interest payable is lower than the intrinsic rate of return on your investment, you can potentially earn ever higher rates of return. If you had borrowed \$99 of the \$100 investment required your return on equity would have been a full 505%.

Banks across the world loaded up on leverage. In fact, immediately before the crisis hit, leverage ratios for banks such as UBS and Deutsche Bank exceeded 60 with other banks such as Barclays, SocGen, RBS and Credit Suisse all coming in over 30. Higher leverage more or less fully accounts for the rise in UK banks' returns on equity up until 2007 with average leverage doubling in the decade in the run up to the crisis.

Derivatives, financial instruments that derive their value from another underlying security are inherently leveraged products. Typically, a derivative can be bought or sold using only a fraction of its total profit (or loss) potential. This means that one can generate 'leveraged returns' through loading up on derivatives. This was another strategy that firms used with the volume of outstanding derivative products exploding from the early 1990s onwards.

Business line diversification

Another strategy used by banks was to diversify into an ever-expanding line of businesses. Ostensibly, this was done with a view to reduce the risks of the firm by diversifying the sources of revenue. However, the direction of diversification was often towards adding on increasingly risky business lines. Commercial banks started doing investment banking. Investment banks expanded into proprietary trading, normally a preserve of hedge funds. While it allowed the individual firms to increase return on equity, it also meant that the financial system as a whole became less diverse and more risky.

The motivation for business line diversification was to use relatively cheap sources of funds available in one part of the business to invest in other riskier parts of the business to generate as high a return as possible. Typically commercial banks have a lower cost of funds (because of deposit insurance) than investment banks which in turn can borrow at lower rates than hedge funds. So commercial banks increasingly used depositor funds for investment bank like activity. Investment banks borrowed heavily to fund their internal hedge funds.

Expansion of trading books

One of the consequences of business line diversification was that most banks had at least two distinct operations - traditional loan making and trading. Due to ill thought out capital requirements specified by the Basel accord, it transpired that the capital banks were supposed to hold against assets held for sale in the trading book was lower than the capital they needed to hold against the same assets when they were held to maturity in the loan book. This meant that banks had an incentive to shift assets to the trading book which allowed them to inflate the return on equity by holding lower capital. This shift was difficult for traditional loans so banks started pooling groups of loans and 'securitizing' them to make them tradable.

The exponential growth of securitization owes its origins to this capital arbitrage trick that banks engaged in to increase their reported profitability. Conflicts of interest at credit rating agencies meant banks were able to put pressure on them to issue inflated ratings for complex securitizations. This further reduced the capital that was required to be held against these securities. Both of these aspects increased the aggregate riskiness of the financial system as well as its reported profitability.

Taking on excessive maturity mismatch risk

Borrowing short term is cheaper than borrowing long term because there is less time for something to go wrong. Lending long term on the other hand, generates a higher return. Borrowing short term to lend longer term is one of the critical functions of banking. However, it is now clear that banks went overboard on this 'maturity-transformation' in a bid to maximise profits earned.

The other way to earn a high spread is to increase the duration of the loans the institution makes. Banks also engaged in this on a large scale. In the UK, for example, the major clearing banks held around 30% of their assets in short-term liquid instruments in the 1970s. This has fallen to about 1% now according to Bank of England data. This too generates excess profits for the bank and bonuses for its employees but at the cost of much greater risk to the institution as well as to the real economy.

Investing in riskier assets

Another way of increasing profits (and risks) was for banks to make increasingly risky loans since riskier loans and assets generate greater returns. This led to the serious deterioration in the asset quality of bank balance sheets. Banks in the US in particular, which faced restrictions on leverage ratios, started investing in sub-prime securities and making risky leveraged loans to fund leveraged buy outs.

Writing options

While other parts of the financial sector watched banks made enviable returns on equity they responded in two ways. One was to copy the banks which led to an increasing similarity in business models and a serious reduction in the diversity of the financial sector. The other was for these firms to invent their own equivalent of bank strategy.

Insurance firms such as AIG found that they could sell options and other derivatives to other financial sector actors and generate significant up-front fees that would translate into higher bonuses. So they started selling these en masse and by the time AIG imploded they had sold over \$1 trillion worth of protection against credit risk. AIG earned profits and its employees earned bonuses while they loaded the firm up with risk that it simply did not have the capacity to bear.

But why would bankers want to risk everything?

The excessive risk taking bonus maximising behaviour that those working in the financial sector engaged in can be easily explained. Bankers kept a significant proportion of the upside that came from such actions while not being exposed to much of the downside risk.

Many have asked the question that if bankers were indeed loading the institutions they ran with excessive risk, why were they not stopped by shareholders? This is because shareholders too only bore a part of the downside risk while sharing the upside with the employees of the firms they owned.

To illustrate, in a typical investment bank, base salaries have been high but 'only' 1.5-3 times the amount earned in the rest of the private sector in a comparable position. However,

compensation structures in banks allow for a very high variable 'bonus' component which can be a significant multiple (anywhere from 2-10 but even as high as 100 times) of the base salary. This is much higher than in any other industry where bonuses are seldom higher than a fraction of the base salary.

One of the reasons for this variable to fixed component ratio in banking is that banking is a cyclical industry where the volatility of profits is high. A higher flexible component of the compensation, at least in theory, makes banks more robust since they are able to significantly decrease their wage bill, one of their largest expenses, if the business is not doing well. This justification, which is often used by bankers themselves, has turned out to be false.

Bonus payments continued unabated in the face of record losses. Andrew Cuomo, the Attorney General for the State of New York summed up the situation succinctly when he said in his report *"...when the banks did well, their employees were paid well. When the banks did poorly, their employees were paid well. And when the banks did very poorly, they were bailed out by taxpayers and their employees were still paid well. Bonuses and overall compensation did not vary significantly as profits diminished"*.

So, when push came to shove and the crisis hit, the risks were eventually borne by tax payers, whose money was used by governments to bail out these very same traders and financial institutions, highlighting the vast asymmetry between rewards and risk within the financial sector.

Systemic risk

Nonetheless, not all risk taking leads to systemic risk. Risk taking is central to the modern day economy and without someone willing to take risks there would be no entrepreneurial activity in the economy whatsoever. Risks come in many forms but the three major categories are 1) liquidity risk 2) credit risk and 3) market risk. A financial system which allocates risks to the institutions best equipped to handle those works well.

However, if the total risk taken is excessive or if it is distributed so financial actors end up with a kind of risk that they have less capacity to bear, it poses a threat to the stability of the whole system. When the banking system as a whole is threatened with massive losses, the risk is systemic in nature and must be handled, as in the recent crisis, at the level of the banking system.

Faced with such a systemic risk, banking systems see collateral values fall; and diversification is no longer useful since many parts of the economy which are otherwise diversified all suffer at the same time. That is why the banking system in much of the developed world needed large scale capital injections from governments.

Regulators have had few tools to deal with this sort of risk as the current crisis has so clearly demonstrated. That is why central banks and governments of a number of countries needed to step in - in an ad hoc fashion to help protect the banking system from collapse.

This has expanded the safety net offered to the banking industry so that liquidity, depositor and capital insurance are all now de facto part of this safety net.

Traditionally regulation has been the counterpart to the provision of this safety net. The expansion of the safety net came at the same time as deregulation took hold so the case

for stronger regulation is crystal clear. Society needs to redraw the social contract with banks on much more stringent terms that entail stronger regulations and a greater contribution towards the costs of insurance.

Why bank collapses have negative spill-overs on other banks

The systemic nature of banks reflects their extreme interconnectedness. Each individual institution can appear to be safe while the links between them mean that the system as a whole is vulnerable. Shocks to any part of the system can propagate speedily across the system and cause a domino like collapse.

Because the sustainability of banks depends crucially on the confidence that depositors have in being able to redeem their funds keeping this confidence high is crucial to keeping individual banks viable and the banking system stable. Unlike other areas of an economy where a failure of a competitor is usually good for business, in banking a failure of one bank can cause a serious crisis of confidence in other banks and have systemic consequences. This can happen for several reasons

- Because banks often have large and significant exposures to other banks, the failure of one bank could inflict large losses on others.
- Because banks often use similar systems and operate in similar markets, the failure of one bank might raise the prospect of the same problem turning up at other banks. Banks have become more like each other than ever before so this similarity can be a major channel of contagion and a source of systemic risk.
- Because banks are increasingly involved in financial markets, the failure of one bank might drive down the markets it operates in due to the forced selling of assets and securities. This happened on a large scale in the present crisis when a drop in the value of real estate mortgage backed securities, that banks the world over had invested in, fell in value triggering off a chain of forced sales and further drops in value.
- Depositors might suspect that the bank has collapsed due to systemic risks which will also affect other banks rather than idiosyncratic risks peculiar to the bank in question.

Public policy thus needs to focus sharply on preventing bank failure, because this can impose costs on other banks as well as the broader economy. If failure is unavoidable, however, public policy should focus on minimising systemic effects on other institutions.

So, the fundamental points that need to be addressed by banking regulation are 1) ensuring the soundness of an individual institution against idiosyncratic risks, 2) minimising the spillovers from one bank onto the broader banking system ,and 3) ensuring the soundness of the banking system against systemic risks.

To date, the focus of regulation has primarily been on point 1 - reducing the risk of institutional failure. The big lesson from this crisis is that regulation needs to shift its focus to point 2 - minimising contagion, and point 3 - mitigating systemic risk.