CHAPTER 6

CENTRAL BANKING

WHAT IT'S ALL ABOUT

- What the role of central banks is in the economy
- How central banks change interest rates
- How interest rates affect the economy
- Why central banks target inflation
- What happens when interest rates get near zero
- How quantitative easing can boost the economy

WHAT DO CENTRAL BANKS DO?

Central banks are essentially the money managers of an economy. They are responsible for monetary policy. By this we mean they try to control the supply and value of money by issuing bank notes or setting interest rates. This is a vital role because as we saw in Chapter 5 money and credit form the very lifeblood of modern economies. If money and credit rise too quickly, businesses may not be able to keep up with the demands for increased production. As a result, they may raise prices which then causes inflation. In contrast, if the amount of money and credit are insufficient for the economy's needs, spending may fall and recession could follow.

The Bank of England in the UK, the Federal Reserve in the United States and the European Central Bank in the euro area all attempt to regulate the flow of money and credit by setting an interest rate – effectively the price of money – in order to control inflation and ensure their economies run smoothly.

For example, suppose the economy is growing too fast and the central bank becomes worried about rising inflation. It could then raise interest rates. This would make it costlier for businesses to borrow and it would raise household mortgage payments. In turn, demand in the economy would slow and inflationary pressures would ease.

If instead, the economy was in recession, the central bank could cut interest rates – making it cheaper to get money – in a bid to kick start demand by giving consumers a little bit extra in their pockets or encouraging companies to invest in new projects.

These days, most central banks in major developed economies tend to be independent. This means they are free from political control to set interest rates or manage the money supply. In the UK, the Bank of England was given 'operational independence' in 1997, meaning it has the power to set interest rates in order to achieve an inflation target set by the government.

The Bank of England has a 9-member Monetary Policy Committee that meets every month to decide what the right level of interest rates should be. They set rates in order to keep the CPI measure of inflation at 2%. That target is called symmetrical because undershooting it is considered just as bad as overshooting it – an inflation rate of 1% would be regarded as just as bad a miss as a rate of 3%.

The European Central Bank has a 22-member Governing Council which also meets monthly to set interest rates for the euro area and is charged with ensuring price stability which it defines as inflation at or just below 2%. The US Federal Reserve has a 12-member Federal Open Market Committee which meets eight times a year and has a dual mandate of price stability and sustainable economic growth. Of course, policymakers can always

convene emergency meetings to change interest rates if the circumstances warrant it. A number of major central banks did just that after the September 11 attacks on the United States in 2001.

Financial markets remain very focused on central bank decisions because they affect the price of currencies, bonds and almost every other financial instrument. In that respect, the Federal Reserve or Fed as it is commonly called is perhaps the most important because of the giant size of the US economy and the US dollar's status as the world's most traded currency.

Pronouncements by central bankers are regarded with great reverence. Banks and financial institutions often employ armies of people to decipher their Delphic

WHO SAID IT

"Whoever controls the volume of money in any country is absolute master of all industry and commerce."

– James A. Garfield

utterances to get a better idea of what the central bank's next policy decision will be. Former Fed chairman Alan Greenspan became famous for never giving anything away. Some commentators even resorted to using the colour of his tie to guess what he was he was going to do on interest rates!

But setting interest rates is not a central bank's only function. They issue bank notes, manage payment systems and act as a bank for all the other banks in their economies. They are the backbone of the financial system, allowing banks to settle accounts with each other, businesses to receive payments and people to receive salaries. The total value of the UK payments system, for example, is more than £800 trillion annually. Central banks also often have responsibility for supervision of banks and other financial institutions.

HOW CENTRAL BANKING STARTED

The Bank of Amsterdam, set up in 1609, is often thought of as the forerunner to the modern-day central bank. Before then, most monetary transactions in Europe were conducted by the exchange of gold and silver coins. But the Bank of Amsterdam started allowing people to deposit their gold and silver with it in exchange for a small fee. The depositors would receive a credit in the bank's books, and this credit became known as bank money. A law was subsequently passed that all bills over

600 guilders had to be settled with bank money, creating a natural demand for accounts at the bank.

Probably the first example of a central bank as we know them now, however, was the establishment of the Bank of England in 1694. Affectionately nicknamed The Old Lady of Threadneedle Street, it was initially set up as the government of the day looked to borrow money from private investors to fund its war efforts, and acquired the responsibility to print money backed with gold.

In America, the First Bank of the United States came into being in 1791, modelled on the Bank of England. But strong political opposition meant its charter expired in 1811 and was not renewed. The Second Bank of the United States was set up in 1816 but that too suffered the same fate in 1836. Subsequent financial panics led to pressure for the creation of a strong central bank and the Federal Reserve was born in 1913. The European Central Bank, meanwhile, is the youngest of the major central banks as it was established in 1999 alongside the launch of the euro, Europe's single currency.

INTEREST RATES

Interest rates are the most powerful tool central banks have to meet their objectives of keeping inflation down or the economy on an even keel. They cut rates or 'loosen' monetary policy to stimulate the economy by

making money cheaper. And they raise rates or 'tighten' monetary policy to cool the economy down and prevent inflation from picking up by raising the cost of borrowing.

The interest rates being talked about in this respect are usually very short term interest rates – the rates financial institutions charge each other for loans to be repaid over a very short period, for example, the next day. Central banks can either set the rate by lending and borrowing at that rate or by actively managing the money supply.

The Federal Reserve, for instance, will announce its target for the overnight interest rate which in the US is called the federal funds rate. It then increases or reduces the money supply to achieve that goal. It does this by buying and selling securities like bonds – transactions that are known as open market operations or OMOs.

So how does that work? Banks in the US, like in many other countries, are required by law to hold a minimum level of cash reserves with the central bank. This reserve requirement or cash reserve ratio as it is known is typically a percentage of the financial institution's demand accounts (deposits that can be withdrawn instantly and without penalty). The requirement is there to ensure that banks do not run out of cash when customers want to make withdrawals.

On any given day, a bank might make new loans which mean that its cash holdings dip below the reserve

requirement. Under normal circumstances, it would then have to top up its reserves by borrowing the money from another bank which had excess reserves. The interest rate for the overnight transaction would be negotiated between the two banks and the weighted average of all such transactions is known as the federal funds effective rate.

Now suppose the Fed wants to reduce interest rates. It will do this by buying bonds from financial institutions. This will give the banks extra money as the Fed pays for its purchases with cash. As we have seen time and time again, what happens when the supply of something goes up? Its price comes down. And remember, the interest rate is just the price of money. So the rise in the money supply will push the interest rate or fed funds effective rate down toward the fed funds target.

If the Fed wanted to raise interest rates, it would sell bonds to banks. They would pay for those with cash, reducing the money supply and thus putting upward pressure on interest rates.

THE TRANSMISSION MECHANISM

But how do those central bank rates affect the economy? First of all, the overnight lending rates then become a benchmark for all the various interest rates in the economy.

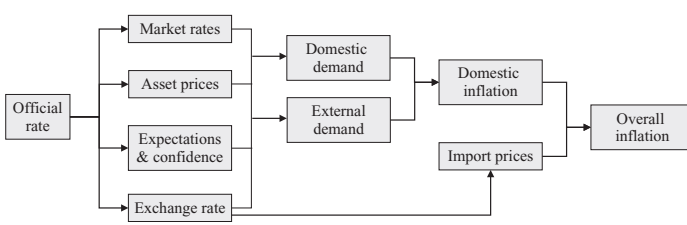
A change in the main central bank rate or even a change in expectations of the main rate can set off a chain reaction which first affects other short-term interest rates, then longer-term interest rates, the value of the currency, stock prices and ultimately consumer and business spending decisions.

The full effect a change in interest rates has on the economy can take as long as two years and there are a variety of different channels through which it works. This process is called the transmission mechanism.

The change in the official interest rate has four main effects:

1. It influences all the other interest rates in the economy, like the one the banks pay into your savings account or you pay the bank on your mortgage.

The transmission mechanism – how interest rates affect the economy



2. It can affect asset prices like the stock or housing market.
3. It can affect a country's exchange rate by making holding that currency more or less attractive.
4. It can alter expectations and confidence.

All of these effects can have a direct impact on demand in the economy. Let's take a look at each of these in turn. For a start, a cut in interest rates will encourage spending as it makes saving less attractive and borrowing more attractive. Lower rates should also cut financing costs for businesses and mortgage costs for consumers, giving them more money to spend. On the other hand, cutting interest rates will also reduce the amount of income savers get from their deposits. But borrowers tend to spend more of their money than lenders so in total interest rate cuts are expected to boost demand.

An interest rate cut can also have the effect of boosting stock prices or house prices partly because it becomes easier to finance borrowing. This then raises the wealth of the holders of those assets, encouraging more demand. Higher house prices might also encourage homeowners to extend their mortgages because they can borrow more on the higher value of their home, giving them more money to spend.

A cut in interest rates should reduce the value of the domestic currency. This should boost the sale of exports as these become cheaper to foreign buyers thereby stimulating the economy. At the same time, the fall in the value

of the currency discourages the use of imports as it makes them more expensive, thereby encouraging the switch to domestically-produced goods.

Finally, confidence may also be boosted by a cut in interest rates, especially if the reduction builds expectations of more cuts to come. For example, in October 2008, many of the world's major central banks got together to cut interest rates on the same day in a bid to revive confidence following the collapse of the giant investment bank Lehman Brothers. Again the effect of a rise in confidence should be higher spending or aggregate demand than would otherwise have been the case.

Suppose then a central bank has cut interest rates and the effect is to boost spending through all the channels mentioned above. What happens next? How might this translate into higher inflation? Well, to begin with the increased demand in the economy should lead to higher output and jobs as producers try and keep pace with the extra spending power.

The supply and demand dynamics of the economy will change. Workers may ask for higher wages as they are now more in demand. The cost of raw materials may go up as producers' demand for them rises because they're making more goods. At the same time, the fall in the currency's value should boost the price of imported goods. Producers may have to pay more for their raw materials they buy from abroad, perhaps for important commodities like oil.

Producers will then try and recoup their higher costs through charging higher prices themselves and ultimately the price rises will move on to consumers, raising inflation. Conversely, a rise in interest rates would work the other way and have the effect of ultimately depressing inflation.

FORECASTING

Of course, none of this happens overnight or quite as simply in the real world. Monetary policy takes a long time to take effect and policymakers have to build this lag in the transmission mechanism into their decisions on interest rates. Economists reckon it can take as long as a year for the full effect of a change in interest rates to affect output or growth in the economy. It can take up to two years for the full effects to be felt on inflation.

The situation is further complicated because central bankers don't have access to perfect information on what is happening with prices or the economy at any given time. Economic data is often published with time lags and is subject to revision.

For example, in 1998, surveys suggested the global economy had slowed very sharply because of the emerging markets crisis we talked about in Chapter 4. Central banks cut interest rates as a result. Figures published

much later showed the economy had actually been growing strongly just when policymakers had been most worried. The rate cuts then helped fuel the dotcom boom of 1999 and 2000 when stock prices of technology firms went through the roof.

Still, central bankers have to base their policy decisions on what information is available at the time and what that says about the outlook for the economy over the following two to three years.

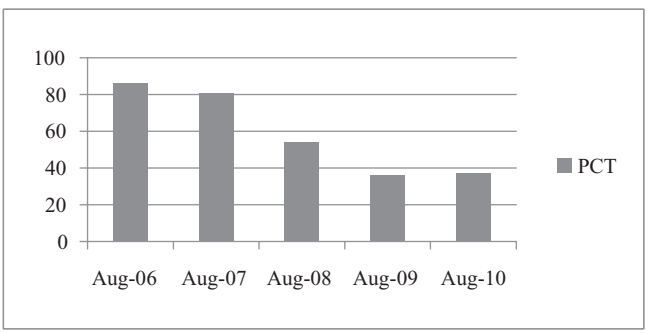
To this end, they construct elaborate economic models which try and gauge what will happen to the economy over a few years and produce regular forecasts. Investors pay very close attention to those forecasts because it gives them an indication of where interest rates are probably headed.

The economist Robert Lucas argued in the 1970s that you couldn't just predict the future using the past as a reliable guide. His argument was that people will adjust their behaviour in response to policy being changed. According to the Lucas Critique, economists trying to predict the effect of a policy change should look at how it will affect individual actions and then aggregate those results across the economy. These models built up from the individual level or what we call the microfoundations are now the norm in central banking circles and are called dynamic stochastic general equilibrium (DSGE) models.

Even so, the predictions using these models remain just that, or best guesses. Many events will be outside the central bank's control. For example, there may be a change in government policy which changes the outlook for the economy. Alternatively, there could be a surge in commodity prices such as oil and gas which sends inflation up but slows growth as companies and consumers find themselves unable to pay the higher costs. There could be a natural disaster or a war.

Economists refer to such events as shocks and they can throw central bank forecasts out of kilter. For this reason, many central banks like to publish their forecasts as a range of probabilities. The chart below shows the percentage chance the Bank of England's two-year-ahead projections for inflation come within a percentage point of its 2% target. In August 2006, the central bank thought it had a more than 80% chance this would happen. It was less than half that four years later.

Likelihood (%) of inflation being within 1% of target in 2 years



INFLATION TARGETING

Ideas based around the work of the economist John Maynard Keynes dominated policymaking after the Second World War. Keynesianism advocated expansionary policies in a recession and contractionary policies during a boom. Suppose the economy was heading into a downturn. Governments could run up deficits and the central bank would cut interest rates. Alternatively, if inflation was picking up, governments could raise taxes or curb spending and the central bank could raise interest rates.

The success of these policies continued all the way into the 1960s and many economists thought they had found the Holy Grail to preserve prosperity. But the general consensus fell apart in the 1970s when huge rises in oil prices caused stagflation in many advanced economies. As we learned in Chapter 2, stagflation is when inflation is high and growth is weak. Expansionary policies were needed to boost the economy but contractionary policies were required to bring down inflation at exactly the same time.

The failure of Keynesianism to come up with a solution led to greater interest in other schools of economic thought and it was a philosophy known as monetarism that gained the most credence. Monetarists, led by the US economist Milton Friedman, argued that changes in the money supply would affect output in the short run and prices in the long run. Central banks, they argued, should therefore target the money supply.

Monetary targeting was widely used by central banks in the 1980s. In the United States, the Fed under the stewardship of Paul Volcker and the UK government of Margaret Thatcher successfully used targeting of the money supply to bring the very high rates of 1970s inflation down to more manageable levels. The European Central Bank had an explicit target for money supply growth when it was set up in 1999.

Monetary targets were called into question, however, in the late 1980s and 1990s when the relationship between the money supply and inflation appeared to break down. Many economists argued it would be better for central banks to target inflation itself. The goal for the central bank would be a particular rate of inflation and it would use policy (that is, interest rates) to try and ensure that rate.

New Zealand became the first country to adopt inflation targeting in 1990. Britain also announced the start of inflation targeting in 1992. Around 25–30 central banks now target inflation. The Fed, European Central Bank and Bank of Japan don't have explicit inflation targets but have adopted many of the elements of an inflation targeting regime.

Inflation targeting frameworks tend to have four main features:

1. An explicit central bank commitment to maintain low and stable inflation as the main goal of monetary policy.
2. An actual numerical target or range for inflation.

Countries with inflation targeting regimes

Country	Date started
New Zealand	1990
Canada	1991
United Kingdom	1992
Sweden	1993
Australia	1993
Czech Republic	1997
Israel	1997
Poland	1998
Brazil	1999
Chile	1999
Colombia	1999
South Africa	2000
Thailand	2000
Korea	2001
Mexico	2001
Iceland	2001
Norway	2001
Hungary	2001
Peru	2002
Philippines	2002
Guatemala	2005
Indonesia	2005
Romania	2005
Turkey	2006
Serbia	2006
Ghana	2007

3. Accountability, ensuring policymakers are visibly taken to task for missing their target.
4. A forward-looking approach to targeting inflation.

Targets tend to be set at around 2% to build in some margin of error against falling into deflation which is generally considered to be more problematic and harder to get out of than inflation.

Proponents of inflation targeting say the system ensures greater confidence in public policymaking and removes a bias for inflationary policies. Investors can be confident that the central bank will act to keep inflation low. Critics argue that it can lead to policymakers being too focused on inflation at a risk of ignoring other things going on in the economy, such as the formation of asset bubbles or unemployment.

MONETARY POLICY RULES

Some central bankers would argue that monetary policy is an art and not a science. A number of economists, however, have argued it is better to have rules which prescribe what action to take depending on the state of the economy at the time.

One such rule is the Taylor Rule after the economist and former US Treasury official John Taylor. The idea is that

WHO YOU NEED TO KNOW

Robert Barro

Robert Barro is a US economist based at Harvard University. Initially a physics graduate from the California Institute of Technology, Barro turned to economics and got his PhD from Harvard in 1970. Considered one of the most influential modern-day economists, his 1984 textbook *Macroeconomics* is widely used in college courses.

Barro's work has been pivotal in the adoption of explicit inflation targets for central banks. Together with David Gordon, he put forward the theory of inflation being a 'dynamic inconsistency' problem. Think of it as a game played between the central bank and the public. According to their argument, central banks will often be tempted into breaking their own inflation targets in order to raise employment. As a result, the public will deduce the target won't be met and raise their own inflation expectations. The end result will be higher inflation and the target will be missed.

That is why, the theory goes, central banks should have explicit inflation targets which they are required to achieve to ensure there is public confidence in their ability and desire to keep inflation down. It explains why the accountability feature of inflation targeting is so important.

Barro has also been a big proponent of rational expectations theory. This is a branch of economics which holds that individuals, or economic agents as they are called, act rationally to maximise their self-interest. In 1974, he wrote a very influential paper called *"Are government bonds net wealth?"* which argued that tax cuts now would have little effect as rational individuals would realise that they would have to be paid for in the future through higher taxes and so would not adjust their present spending patterns. This concept, known as Ricardian Equivalence after the nineteenth century English economist David Ricardo, is still actively debated now.

if inflation is picking up or the economy was running too fast, this rule would prescribe how much interest rates need to be raised by to bring it under control. If the economy was weakening, the rule would say how far interest rates should be brought down.

The formula for devising the actual amounts by which interest rates should be raised or lowered would be based on looking at a period in which monetary policy was considered to have done a good job in managing the economy and inflation.

Arguments for central banks adopting such rules include that it would allow policymakers to communicate their actions better. Also, if policy is based on a well-established rule, then the central bank's accountability and credibility may increase. Financial markets will also find it easier to forecast future policy decisions and this will reduce uncertainty, which is good for investment decisions.

But there are also arguments against. One is that the right level of interest rates compatible with longer term goals might vary over time. There is also a lot of uncertainty around where precisely the economy is in relation to full employment – a key input into a monetary policy rule.

While there remains considerable debate about the use of rules, most major central banks like the Fed, Bank of England and European Central Bank still don't subscribe to any pre-set stipulations and favour what is known as 'constrained discretion'.

WHO YOU NEED TO KNOW

John Taylor

Born in 1946, Stanford University professor John Taylor has been at the forefront of economic policymaking and theory since the 1970s. He studied first at Princeton University before getting his PhD at Stanford.

Between 2001 and 2005, Taylor was the US Treasury's Under Secretary for International Affairs where he was responsible for policies on currencies, international debt and oversight of the International Monetary Fund. He was also a member of the President's Council of Economic Advisers from 1989 to 1991.

He is most famous for his formulation of the Taylor Rule in 1992 which suggested that the Federal Reserve could set interest rates using a simple equation looking at the current rate of inflation and where the economy was in relation to its trend level of output. According to Taylor, the equation also explained what the Fed had been doing over the past five years.

The rule caused an immediate stir in both financial markets and among

policymakers. Soon, Fed staff were providing the central bank's rate-setting committee with various permutations of the rule before each interest rate decision. Taylor was even invited into the Fed to discuss the rule and its application with Fed policymakers in 1995.

But Alan Greenspan, chairman of the Fed through the 1990s, believed that discretion was better than a rules-based approach to setting interest rates. The Taylor Rule, he said, only worked if the future was like the past. 'Unfortunately, however, history is not an infallible guide to the future,' Greenspan argued.

QUANTITATIVE EASING

In this chapter we have seen that central banks can cut interest rates to try and stimulate an economy when it is slowing down and facing the threat of recession. They can also raise interest rates to slow an economy down to prevent inflation. But while interest rates can keep going up if need be, there is clearly a lower limit for them – zero. That is why it can be much easier to stop an economic boom than pull out of a deep bust.

The economist John Maynard Keynes summarised this problem by describing trying to get an economy out of a severe recession as 'like pushing on a string.' Another way of putting it is that it's easy to curb demand but harder to create it when it doesn't exist. The economy is said to be in a liquidity trap when monetary policy is no longer effective at stimulating demand. This might be because people prefer to hold on to cash no matter how much the supply of money increases or interest rates fall, perhaps because they expect prices to fall further meaning they'd be better off postponing any spending.

So what happens when interest rates are already at zero or close to it and the economy still needs more support? This is the situation policymakers in Japan found themselves in during the early 2000s. The Japanese economy had slowed sharply after the collapse of its bubble economy in the late 1980s/early 1990s. By 1995, it was experiencing deflation. Successive huge government spending programmes and interest rates being held at close to zero appeared to have no effect at lifting the economy out of its depression.

Then in March 2001, the Bank of Japan, the country's central bank, embarked on its now-famous policy of quantitative easing. Instead of just setting the interest rate at zero, the central bank flooded the market with new money by buying securities like long-term Japanese government bonds from banks.

WHO SAID IT

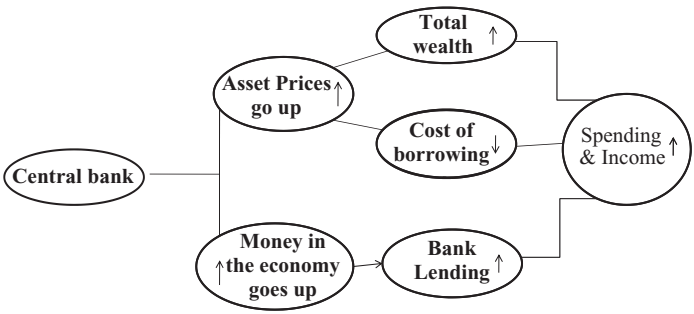
"The US government has a technology, called a printing press (or, today, its electronic equivalent), that allows it to produce as many US dollars as it wishes at essentially no cost."
– Ben Bernanke

In effect, the Bank of Japan was creating new money and putting it into the banking system. That is why quantitative easing, or QE, is often popularly referred to as a policy of printing money. Of course, there are no actual banknotes being printed. Banks' accounts with the central bank are just credited with the extra funds, just in the same way as if your bank credited your account, except in this case the central bank would have created the money out of thin air.

The Bank of England also started its own quantitative easing programme in March 2009 after first cutting interest rates to a record low of 0.5% in the depths of the 2008/09 recession. It too created new money and bought with it mostly UK government bonds from banks in the hope that they would start lending the cash and boost spending in the economy.

How does this actually work? The central bank simply offers to buy several billion pounds of bonds from financial institutions on a regular basis. Participating banks would sell the bonds and in return saw their accounts at the central bank credited with the cash.

How quantitative easing works



The idea is that the financial institutions can use the extra cash to spend on goods or services or other assets. Asset prices should also increase, making people feel richer. At the same time, banks should be willing to lend more as their money holdings have increased and the cost of borrowing should fall. The improvement in credit conditions and rise in wealth should then encourage people and businesses to spend more, boosting the overall economy.

While quantitative easing at its simplest aims to boost the money supply to stimulate spending, central banks can also target which securities they buy with the newly-

created money to affect their prices and change overall credit conditions in the economy. For example, the Fed conducted its own version of quantitative easing in 2009 which it preferred to call credit easing. In this, it bought mortgage-backed securities – pools of mortgage loans – in a bid to reduce the cost of home loans and make them more available. The Feb went on to expand its quantitative easing programme to government bonds in 2010.

But the real question for quantitative easing is whether it works. Economists remain divided on this. Japan continued with its policy of quantitative easing until 2006 and while the economy did begin to grow in this period, the recovery was never spectacular. Some argue that things would have been even worse for Japan without the extra money pumped into the economy and others say it made no difference at all. Similarly, policymakers in the US and UK argue their programmes stopped a bad situation getting worse and did help the economy by bringing down borrowing costs for companies and consumers.

Critics of quantitative easing argue that it could lead to hyperinflation, the phenomenon of sharply rising prices discussed in Chapter 2, because of all the excess money being put into the economy. An opposite problem is if banks hoard the extra cash in order to rebuild their own balance sheets that might have been showing hefty losses. The result would be that the extra money doesn't get into the economy.

FINANCIAL STABILITY

The role of central banks doesn't stop at managing demand and inflation in the economy. They typically have an important role in maintaining financial stability. By this, we mean that they watch over the health of the entire financial system. They oversee how banks do business and ensure that markets are running smoothly.

They also often fulfil a function that is known as being the lender of last resort. This is an institution that is willing to extend credit when no one else will. So a bank unable to borrow elsewhere could go to a central bank as a last-ditch effort to raise funds. Usually, the central bank as the lender of last resort would provide the money needed but at a much higher interest rate than it would normally charge.

Usually, few institutions avail themselves of such a facility because of the stigma of it becoming known they were unable to get credit anywhere else. This could in fact exacerbate their bad credit standing and put further pressure on them.

This is what happened to the Northern Rock bank in the UK in 2007. Unable to raise any more money, the bank was forced to call on the Bank of England's emergency lending facility to help tide it over. When news that Northern Rock was using the facility broke, there was a

stampede of depositors trying to get their money out as they feared the bank was about to go bust – the first bank run in the UK in nearly 150 years.

Central banks might also be reluctant to always stand ready to provide funding for any bank that needs it. That is because knowing the central bank was always available with more funds might encourage banks to take excessive risk. Economists call this the problem of moral hazard. Insurance companies, for example, try deal with this all the time by having an 'excess.' Policyholders have to absorb that cost themselves before they receive any payout so as to ensure they take some care themselves.

Still, central banks have to stand ready to provide emergency funding because they may also be worried that the collapse of one bank could have consequences for many others and the financial system as a whole. This is known as systemic risk. The collapse of the investment bank Lehman Brothers in 2008 generated a lot of debate among regulators about whether some banks are too big to fail. By this, they mean banks that are so large that their collapse could endanger the whole financial system because of the interconnected nature of markets.

Since then, there has also been a lot more focus on central banks taking what is called a macro-prudential approach. This means they should look at the effect of any regulatory policies not just on an individual bank, but on the banking system as a whole. The thinking is that while it may be okay for one bank to have borrowed

a certain amount, it would be really bad if every bank was equally in debt. Central banks, some economists argue, should be given powers to manage this type of risk if there is to be a safer financial system.

These could include controls over how much banks lend to prevent excessive speculation. For example, one idea many economists talk about is giving central banks a say over how big a mortgage anyone gets. The central bank might be able to set a limit on banks lending anything more than, say, three times someone's salary for a home loan.

The central banks of the future will likely not just have powers over setting interest rates but may have a whole arsenal of new weapons to maintain financial stability and keep the economy ticking.

WHAT YOU NEED TO READ

- The Federal Reserve has an excellent website explaining the history of the US central bank and how it works. *www.federalreserve.gov/.*
- The Bank for International Settlements is the bank for central banks and its website has a useful collection of articles and discussions about all the latest issues. *www.bis.org/.*

- For a detailed look at the benefits of inflation targeting, consider reading *Inflation Targeting: Lessons from the International Experience* by Ben Bernanke, Thomas Laubach, Frederic Mishkin & Adam Posen, Princeton University Press, 1999.

- For a riveting account of the 2008/09 crisis and the Fed's response, have a look at *In Fed We Trust* by David Wessel, Random House, 2009.

- For the problems faced by Japan's policy-makers in trying to get their economy out of deflation, have a look at *Japan's Policy Trap* by Akio Mikuni and R. Taggart Murphy, Brookings Institution Press, 2002.

IF YOU ONLY REMEMBER ONE THING

Central banks are the money managers of economies and are responsible for monetary policy. They can raise interest rates to slow the economy and keep inflation down and they can cut interest rates to boost demand in the economy.