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SUMMARY

This Report compares the strategy of the ECB with that of eight other central banks, to suggest reforms in its goals, institutional arrangements and monetary instruments. Despite the comparative success of the euro as an international currency, the present financial crisis has uncovered some flaws in the functioning of the ECB that can be put in order by attending to the experience of the ECB and the other eight central banks examined.

1. The theoretical basis of monetary policy

- The starting point for our analysis of central bank strategy and the justification for central bank independence in the pursuit of a non-political remit is the fact that there is no long run trade-off between inflation on the one hand and employment and output on the other (there is no exploitable Phillips curve).
    - Over a period of nine to ten years, increase in the money supply will result in a similar rise in the rate of increase of the general price level and will have no systematic effect on the real side of the economy.
    - This belief is based on a long run interpretation of the "quantity theory", expressed by Fisher as

      $$P \equiv (M \cdot V) / T,$$

      where the price level P is shown to depend on the quantity of money M, the velocity of circulation V, all divided by the number of transactions T. In the long term, however, the effects of an increase in the money supply will have run their short-lived course and the expansion of M will have fallen wholly on P.
    - Rational expectations imply that sooner or later inflation fully enters the public's expectations (in central banker parlance, "inflation expectations become unanchored"). When the information about increases in money supply is fully discounted by the market, it will be passed on to prices, so that employment and real output turn out not to be correlated to money supply. (This is an instance of the separability of the nominal and the real economy, the so-called "classical dichotomy").
    - In the short and medium run, however, *unexpected* inflation can lead to an expansion of jobs and output, since people may then interpret growing prices as increases in the real demand for their goods and services.
    - Hence, a time-inconsistency problem arises for monetary policy. Unless some institutional arrangement forces monetary and political authorities to focus on the long run, they will tend to pursue monetary policies that lead the economy down a less than optimal growth path. One such institutional arrangement is granting a measure of independence to the central bank, so that, free from political pressures, it can follow a monetary policy leading to a stable value of money.

- Inflation has high costs:
  - the 'shoe leather cost' of looking for goods and services at non-inflated prices to avoid the opportunity cost of holding money that depreciates;
  - the cost of changing one's prices with inflation;
  - the misalignment of prices from staggered nominal price-setting;
  - the deterioration of the currency as unit of account;
  - the unfair redistribution brought about by inflation: it redistributes income unfairly, both with the tax drift caused by progressive rates on higher nominal incomes and with debtors obtaining windfall losses at the expense of lenders; and vice versa for deflation.

  However, if the rate of inflation is small, its effects may be slightly but consistently positive.
- Institutions for price stability
  - Fixed exchange rate regimes are one kind, by which a country prone to inflation pegs its currency to that of a more stable economy. The more common way is setting up a currency board, as some EMU candidate countries have done with the euro. An extreme kind of peg is to give up one's currency in favour of the dollar or the euro, a course of action perhaps advisable for countries whose small size makes them highly vulnerable to external shocks.
  - Another kind of arrangement is central bank independence, coupled with the rule that the central bank (CB) must bring about a reduced rate of inflation.
- The general agreement is that in an advanced country, the rate of inflation should be held at between 2 and 3%, since Consumer Price Indices (CPIs) tend to underestimate quality changes and thus reflect apparent price increases. In countries with an underdeveloped tax system, inflation and tariffs may be the only significant sources of revenue for the State; hence less orthodox monetary and trade policies may be excusable.

2. The evolution of monetary strategies

- All central banks today have the following two aims in their strategy:
  - To keep the value of money steady by avoiding inflation and deflation;
  - To maintain the financial system in good working order.
- The 20th century started with the gold standard holding general sway in the world and ended with attempts to get the benefits of a reliable currency by other means. Also and just as in gold standard days, central banks have to look after the stability of the financial sector under their care.
  - After World War II, the machinery established at Bretton Woods tried to guarantee the value of participating currencies by half pegging them to the dollar, while the dollar was pegged to gold; while the stability of the members' financial systems was based on IMF supervision and, if necessary, conditional loans.

- With the oil crises of the 1970s, the "Bretton Woods trilemma" became apparent: countries cannot at the same time maintain exchange rate stability, stay open financially and commercially, and exercise monetary independence. Discretionary policymaking by CBs ushered a period of monetary disorder, with high and variable inflation rates and worrying unemployment rates.
- Under the leadership of that great President of the Fed, Paul Volcker, followed by Margaret Thatcher in Britain, the need to control the money supply became the orthodox policy.
- The US having reined in runaway inflation, the world entered the period of the "Great Moderation", with stable prices, high growth rates and low unemployment. The world economy functioned well based on floating exchanges and financial globalisation.
- For a time, CBs especially used the control of some definition of the stock of money, such as the monetary base or a broad money measure (such as M3) to rein in inflation and counteract recessions, by means of liquidity injections or withdrawals. But the connection between M3 growth and the CPI appeared to break down; and the difficulty to manage money supply directly in a world of globalised finance has led monetary authorities to prefer short-term interest rates as their instrument. This may have gone too far, in that money plays no role in the canonical New Keynesian macroeconomic models.
- Another element of CB strategy went off track. The Lender of Last Resort function morphed into the "Greenspan put", the guarantee that over the medium term nominal income and stock exchange indices would not be allowed to fall.

- Finally, the present financial and foreign exchange crisis has highlighted some of the weaknesses of an anchorless monetary system coupled with central bank autonomy. Led by the Fed, CBs seemingly tried to avoid downturns and deflation at all costs. This led to over-indulgent monetary policies resulting in unsustainable booms in property and securities and finally to the 2007-2008 crash.

3. The euro and the ESCB

- After a number of failed attempts, the Maastricht Treaty (1992) finally created the European Monetary Union. The signature of the Stability and Growth Pact in 1997 preceded the actual launch of the euro in 1999, a Pact whose aim was to underpin the new currency with stable fiscal policies in all Member States. The new currency is now well established in Europe and the world. The impatience of some of the recent arrivals in the EU to join the euro club is an indication of the frailty of small monetary areas when world finances are in turmoil.

- The new currency is managed by the European System of Central Banks (ESCB) under the leadership of the European Central Bank (ECB). The ECB's ultimate legitimacy derives from the Treaties and thus from the national parliaments of the Member States. According the Maastricht Treaty, the ECB is an independent institution within the EU and may not even lend to European institutions or to Member States. It informs the European Parliament but receives no instructions from it.
- "The primary objective of the ESCB shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community." So read the Treaties.
- At present, the definition of the primary objective has been interpreted by the ECB Governing Council as aiming to keep the increase of the Harmonised Index of Consumer Prices (HICP) at rates "below, but close to, 2% over the medium term".
- The ECB adopted in 1999 a two-pillar strategy; within this strategy, the ECB assessed inflationary presures by analysing both the first pillar (money growth and other financial indicators) and the second pillar (a broad set of real indicators). From 1999 to 2003 the ECB assigned to money growth a primary role in predicting inflation, and even published a *reference value* (not an intermediate target) for M3 growth compatible with price stability; thus, broad money growth was viewed as the main policy guide during those years. However, in May 2003 the ECB reviewed and clarified its strategy, and abandoned the publication of that reference value. The reason was the persistent deviation of M3 growth from the announced reference value, without any observable effect on CPI inflation developments; which also made the ECB communication policy more difficult and exposed to misunderstanding.
    - The general framework is the simultaneous appraisal or crosschecking of the two sets of data modelled as "pillars", to help formulate a forward-looking price policy.
    - The "first pillar" (or monetary analysis) includes all monetary data that are relevant for the ECB's monetary decisions.
    - The "second pillar" (or economic analysis) models expectations about the real economy, on the assumption that inflation and deflation in the short and medium term are correlated to: the "output gap" – the difference between the observed aggregate output and the trend real output of the Eurozone – and the difference between the unobservable real rate of interest and the bank rate.
- For transparency, the ECB uses: a weekly financial statement, Monthly Bulletins, quarterly reports and an annual report; announcements of monetary decisions at the end of each Governing Council meeting, though no minutes or voting records are published; quarterly hearings of the President of the ECB at the European Parliament; and among others, "Eurosystem staff projections" and "ECB staff projections" published twice a year alternatively.

- Transparency at the ECB, however, is short of ideal: the two-pillar system contrasts with the practice of other CBs of making its model of the economy known.
- In the same vein, the ECB has consciously refrained from specifying the length of its "medium term", though according to some studies, and the statements of some ECB board members, policy measures start to affect the targeted variables after 3 or 4 quarters; the peak effect takes place after 8 to 9 quarters and then decays gradually.
- Transparency is a desirable democratic requisite and a crucial element for conducting an effective monetary policy. The commitment of the central bank to its strategy is more credible the more information it gives. The public's ability confidently to discount short-term variance in the price level reduces price fluctuations and the real costs of monetary policy. Finally, the benefits of transparency are especially large in the event of a shock, as a credible CB enjoys more leeway how much to react without affecting long-term expectations.

- Supervision and regulation at the ESCB have become controversial in the present crisis, because the competencies are delegated to the national level, where the national central banks (NCBs) or separate bodies conduct them.
  - A *Memorandum of Understanding* allows some cooperation by the ESCB Banking Supervision Committee, the Economic and Financial Committee, the Financial Services Committee and the Committee of European Banking Supervisors.
  - The system is under revision following the recommendations of the de Larosière Group.
- The ECB has followed a more prudent strategy than the Fed (because of the need to preserve consensus in a big board?). This relative prudence, however, fell short of what was needed. The directorate of the ECB paid more attention to the demands of the French and German governments, which wanted monetary easing to boost their growth, rather than the circumstances of peripheral EU countries, such as Ireland, Spain and Greece that now have reason to rue those relatively low interest rates and the attendant housing and securities boom.

4. Strategies of other banks of reference

We have divided the eleven CBs into two groups: the four large ones, the ECB, the Fed, the Bank of England and the Bank of Japan – and other CBs of interest because they show features that could prove interesting for the ECB. To start with the smaller ones:

New Zealand

- The Reserve Bank Act of 1989 determined that the primary function of the Reserve Bank of New Zealand (RBNZ) was "to formulate and implement monetary policy directed to … achieving and maintaining stability in the general level of prices".

- An annual CPI inflation rate in the range of 0 to 2% was taken to represent the achievement of price stability. House prices and credit services were soon taken out of the CPI index.
    - Previously, the Labour Government had opted for a free float of the New Zealand (NZ) dollar, a necessary condition for an independent monetary policy.
    - The central bank would not be held responsible for the effect of major supply-side shocks, government policy changes, particularly in taxation and administered prices.
- The minister and the appointed or reappointed Governor would subscribe to a Policy Target Agreement (PTA), containing a forward looking inflation target, and the Governor was personally responsible for achieving it.
    - Inflation targeting predated its adoption by other CBs and was the result not of academic research but of political exigencies.
    - Expected inflation was the main information datum supplied to the markets.
    - The duty of reporting frequently and regularly turned the Bank from secretive to open.
- With the reputation of the RBNZ consolidating, the PTAs signed along the years delineated a more flexible monetary regime.
    - Initially, the Bank used narrow money as an immediate target and instrument and set a short run interest rate but this caused excessive volatility in the short-run markets.
    - It very soon moved to formal inflation targeting, by making its inflation expectations explicit and also its no-inflation horizon. With a better knowledge of transmission channels, the Bank was able to lengthen the period to that horizon.
    - Under some political pressure, the successive PTAs eased the target to between 1% and 3%. The RBNZ then aimed for the middle of the range.
- The New Zealand system of stability of the financial markets and supervision of the banks is worthy of study.
    - Banks have to disclose major features of their balance sheets quarterly.
    - The failure of most finance companies in 2007-8 has led to extending regulation from banks to insurance and other intermediaries.
    - In normal times bank deposits are not guaranteed; only during the present crisis have such guarantees been issued. In the event of a run, the RBNZ would become the statutory manager and write down claims until the bank was recapitalised and open for business again. These powers have never been used.
    - All New Zealand banks are foreign-owned but are all subsidiaries, thus avoiding the problems that a branch system poses for small economies, as the Iceland meltdown has shown.

- The best test of the New Zealand arrangements is that they have been widely copied.
    - The positive lessons have been: a clear institutional framework of accountability; and very explicit inflation targeting.
    - The negative lesson has been that the small size of the New Zealand monetary zone and economy has made monetary and exchange rate policy difficult to manage. The Bank, finding it difficult to keep inflation down, has had to set high interest rates. This has led to an overvalued currency, with spikes in the real exchange and the dangerous development of the foreign exchange carry-trade.

The link of the Swedish krona with the euro

- The fixed exchange system proved time and again unsustainable, both under Bretton Woods and after Sweden joined the Exchange Rate Mechanism (ERM).
- On abandoning the exchange peg at the end of 1992, Sweden adopted inflation targeting, this despite an experience of price level targeting in the 1930s.
- The Riksbank became independent in 1999, so that the six members of the Executive Board cannot seek or accept monetary instructions.
- The informational basis for inflation targeting was refined with experience:
    - Quarterly Inflation Reports;
    - Decision under uncertainty, underlined by publishing fan charts showing explicit probabilities for inflation forecasts;
    - 18-24 months time horizon;
    - Model-based assessment of monetary policy that makes it endogenous.
- Inflation targeting became more effective as the Riksbank turned into one of the more transparent CBs.
    - Six regular Monetary Policy Reports a year signed by the Executive Board, who are personally responsible;
    - Minutes of the meetings published with a lag of 2 weeks;
    - Transparency could go no further, as it could lead to publicity-conscious positioning.
- The Riksbank is not the supervisor of the financial system but works in close conjunction with the integrated supervisory authority at the Ministry of Finance.
- The present turmoil has highlighted the special difficulties faced by small countries facing runs on their currency. Since becoming independent, however, the Riksbank has been outstandingly successful in fulfilling its remit: the Swedish record on inflation has been rather better than that of the ECB; policy has not needed to be much more active; and the Swedish economy has not been more volatile than those of its partners.

The Baltic States, mainly Estonia

- On attaining independence, all three Baltic States have set up strong currency pegs to attain price stability. Estonia and Lithuania pegged via a currency board, one to the Deutschemark and one to the Dollar initially, while Latvia did to a basket of currencies.
- A currency board is no *panacea*: it needs to be accompanied by the rule of law, good institutions, a prudent fiscal policy, political stability and a flexible economy.
- As with the Czech Republic, their experience supports a multi-stage strategy for small countries wishing to join the euro (or dollarise):
  - A hard peg initially until inflation is brought down;
  - inflation targeting to stand a better chance of controlling inflation;
  - Finally entering ERM2 for two years or so, to prepare for convergence.
- The supervisory arrangements of Estonia are especially interesting:
  - Banking supervision was split off from the Bank of Estonia in 2002. However the supervisory agency is an agency of the Bank of Estonia. At the same time the agency acquired responsibility for insurance and securities markets, which had previously been dealt with separately.
  - Though EU rules would allow the large branch of the Finnish bank Nordea to be supervised directly from Finland, the Finnish authorities have decided to operate supervision with the Estonian supervisor acting as an agent.

The Czech Republic

- After monetary separation from Slovakia
  - The currency divorce between the Czech Republic and Slovakia on 1 January 1993 was smooth and easy, an indication that the difficulties adduced against leaving a monetary union are more a question of game theory than economic theory.
  - The Czech National Bank (CNB) at first chose an exchange rate peg but targeting inflation rather than the exchange rate, as the inflation remained stubbornly high. The price effects of the 1997 devaluation of the koruna and the freeing of regulated prices had to be digested.
- Approaching EMU
  - For the transition to the euro a shift was made to inflation targeting in early 1998. The Bank Law had laid down the independence of the CNB. The price stability objective was set at 1% - 3% a year.

- The CNB took some time understanding that convergence from the lower price *level* in the Czech Republic to that of the euro zone did not imply higher price *inflation* and should not be worked into the inflation forecasts. Repeated undershooting of the inflation target due to productivity increases showed that only inflation can be dealt with by monetary policy; convergence of price levels depends on relative productivities. A transition economy can operate successfully with low levels of inflation despite a large price level gap.
- Prematurely joining EMU would have impeded the nominal appreciation of the koruna demanded by Czech productivity strides needed when relative prices are still rigid. Also, State spending an the budget deficit had to be brought in line before Optimal Currency Area conditions obtained, so as to make life within the euro zone comfortable.
- Real convergence is progressing well and one can expect that the Czechs will join EMU in time on more equal terms than other new members will.

- Financial stability
  - The CNB has been deeply involved in the supervision and reorganisation of the financial system, when many banks got into difficulties and indeed failed.
  - Within its organisation, the CNB has deliberately separated its financial stability and financial supervisory functions although the information flow remains. This enables stability to be treated as an economy-wide issue rather than simply be built up from aggregating the experience with the individual banks.

China's monetary policy

- China's monetary policy is slowly evolving from that typical of a State-controlled financial system to one free of interest rate limits, credit directives and capital controls. China's central bank is not an independent monetary authority.
  - Though the People's Bank of China's (PBoC) official objective is to "maintain the stability of the value of the currency and thereby promote economic growth", monetary targets are not so much intended for inflation control but mainly for growth promotion.
  - A subsidiary aim is to avoid both excessive inflation and deflation.
- Money supply has occupied a central place in the monetary policy framework. Domestic growth in credit has also served as an intermediate target for monetary policy.
  - Capital controls allow China to use money supply for its monetary policy rather than interest rates, which do not work well in a semi-command economy.
  - In the mid-1990s, the People's Bank started to publish annual intermediate targets for monetary aggregates, M1 and M2 being the most prominent.

- The PBoC controls the growth of monetary base by open-market operations and with the adjustment of the reserve requirements.
- Interest rate liberalization began in 1996, although in the second quarter of 2007 the share of floating-rate loans that had interest rates above the benchmark rate was still only 44%. To diminish the impacts of the global financial crisis on China, in autumn 2008 interest rates were cut a total of five times.

- China's monetary policy operates in the framework of limited flexibility in its exchange rate.
  - The exchange rate system was officially changed to a managed float. Since 1995 until mid-2005, the yuan was pegged to the US dollar.
  - In July 2005, the authorities announced that the yuan would be pegged to a basket of currencies. Nevertheless, the US dollar has clearly occupied a central place in the currency basket.
  - Including the small revaluation of July 2005, the yuan has appreciated by end-2008 by some 20% against the US dollar
- Though in 2003 the China Banking Regulatory Commission (CBRC) was established to supervise the banking industry, the amended central bank law of December 2003 mentions the regulation of financial markets.
  - The central bank's functions include interbank lending and bond markets, foreign exchange and gold markets, together with the prevention and mitigation of financial risks to safeguard financial stability.
  - Reform is taking place in the banking sector and commercial banks' activities were under close guidance of the authorities. However, the stability of the Chinese financial system is more than ever in doubt. This could make the yuan appear overvalued if one considers the risk factor.

The easy money policy of the Bank of Japan (BoJ)

- Japan provides helpful pointers as to what to do and not to do in the face of deflation and the zero bound for the nominal rate of interest. Japan also provides pointers over how to avoid protracting recession far longer than necessary.
- Land prices and the stock market indices quadrupled in the boom from 1985 to 1991. Then, asset prices fell for a long period.
  - Land prices declined very rapidly for 5 years and then continued to decline more slowly to below their starting values.
  - The stock market showed a 60% decline by 1992, then 8 years of volatility and a second decline at the bursting of the dotcom bubble.
- Accompanying this poor economic performance has been a slow decrease in the price level. Inflation was briefly negative in 1995 but from 1998 until 2003 the price level fell slowly by 3% after which prices were stable through to late 2007, and it is only in 2008 that inflation started to reach levels typical of other OECD economies.

In the last few months inflation has again died away. However, Broda and Weinstein (2007) argue that the actual deflation problem in Japan is much larger because the computation of the price index is deficient and implies an overestimate of the rate of inflation by as much as 1% a year compared to the United States. Since US inflation is itself thought to be biased upwards by around 1%, the limited measured deflation in Japan may reflect a decline in a properly measured price level in excess of 20%. The economy has not really got back to sustained growth two decades after the original collapse in asset prices.

- Monetary policy was eased steadily until the rate reached 0.5% in 1996 and with intervals was effectively at the zero bound down to 2008.
    - In the second half of 2001 the Bank began a policy of 'quantitative easing' which continued until 2008, seeking to increase the liquidity taken up by the banks despite the zero interest rate.
    - Japan has been criticised for not taking other measures, particularly for not seeking to depreciate the exchange rate or tackle the problem of hidden losses, particularly among the banks.
- The 1998 new BoJ Law granted it effective independence.
    - There is a record kept of the policy board meetings, focusing on what was decided and why. There is an opportunity for members to express dissent. Detailed minutes are published with a six week lag and the Governor gives a press conference after the decisions.
    - On being granted independence, the BoJ, wanting to build up a reputation for inflation aversion, erred on the side of monetary restriction.
- There have been attempts to solve the conundrum of Japanese deflation by blaming the BoJ for not keeping policy in line with a Taylor rule.
    - The Taylor rule is useful as a *post hoc* description but, as it is not forward-looking and ignores information on asset prices, it is not so useful in prescription.
    - The BoJ has not formulated an inflation target nor even communicated clear objectives. Consequently, mistiming of CB action may explain a great deal of the conundrum.
- Recourse was had to quantitative easing after the year 2000 recovery evaporated. The BoJ pushed commercial banks to increasing the short term reserves they held at the CB.
    - The problem for banks was not so much funding as an unhealthy balance sheet.
    - Quantitative easing ended in 2006 and its actual contribution to the ending of deflation is not clear.
- The BoJ was sceptical about the effectiveness of monetary policy in the situation of the banking sector.
    - In the early stages of the crisis there was a need to recognise the losses particularly in the banking system and then recapitalise the banks.

- The process merely created large weak banks to replace the smaller ones.
- Later in the crisis, the BoJ argued that restructuring was required – the inefficient banks must go out of business so that the dynamic could prosper.

- The lesson could be drawn from the Japanese experience that in a crisis such as the present one, the problem is not liquidity risk but counterparty risk.

Inflation targeting in the UK

- Inflation targeting came as a surprise in the UK but had been long in the brewing. On becoming Chancellor, Gordon Brown had the 1997 Bank of England Act passed and implemented: thereby the Bank became independent in that it could vary its policy instrument as it wished to achieve a particular level of a particular measure of inflation, both chosen by the Government.
  - The pound had been pegged to the dollar after Bretton Woods, was floated without an anchor in the seventies (when in August 1975 inflation reached 27% per annum).
  - When Margaret Thatcher became Prime Minister in 1979 she immediately announced a "Medium Term Financial Strategy", one of whose key parts was targeting money supply to fight inflation. The connection between M3 and price rises seemed statistically well established but soon broke down.
  - The anchor was changed to shadowing the Deutschmark and joining the ERM. In 1992, however Britain had to leave the ERM.
  - Then started a period of increasing disclosure of inflation forecasts by the Bank that ended with the Bank in charge of implementing monetary policy.
- The institutional set-up conforms to inflation targeting arrangements elsewhere.
  - A Monetary Policy Committee (MPC) of nine members chaired by the Governor – five from the Bank, four outsiders – takes interest rate decisions. The MPC meets monthly and detailed minutes are published but with no attribution to individual members. Interest rate decisions are announced at the end of each meeting. An *Inflation Report* published quarterly gives forecasts for inflation and output, and key underlying assumptions such as the path of the exchange rate.
  - The Governor must send an open letter to the Chancellor if inflation is more than 1 percentage point above or below target. This letter explains why the deviation has occurred, what is going to be done about it, when it is expected to return to the target range, and why, in some circumstances, it would be wrong to try to bring inflation back to target too quickly. The Treasury Committee of the House of Commons hears the Governor on set occasions.
- The target the MPC has to achieve is inflation measured by the Consumer Price Index, another name for the EU's Harmonised Index of Consumer Prices, often criticised because it excludes housing costs.

- The MPC has to achieve the inflation target with consideration to the behaviour of the real economy, not responding aggressively to deviations from target.

- The instrument is the official short term interest rate, the rate at which the Bank supplies reserves to the banking sector.
  - Banks can also borrow as much as they want (against collateral) through a "standing facility", at 1 percentage point above base rate, and deposit at the Bank any reserves they do not need at a rate 1 percentage point below base rate.
  - When the London Interbank Offer Rate (LIBOR) is very substantially above base rate, this is an indication of serious liquidity or counterparty risk.
- The system is designed to achieve credibility and time consistency.
  - The Bank together with the MPC publishes two-year forecasts. These now take the form of probability fan charts, as with the Riksbank.
  - The model on which such forecasts are calculated is published in full but may give different results according to how inflation expectations are assumed to form.
  - Votes are personally attributed to each member of the MPC, which makes them accountable for their decisions.
  - The "Open Letter" is a unique feature in the monetary policy-making world and one which we generally thought to enhance credibility.
- Several matters could undermine time consistency and credibility.
  - No formal procedure is necessary to change the target.
  - LIBOR overrun as at present casts doubts on the efficiency of the system.
  - The system has been buffeted by large-scale upheavals in a globalised and innovating financial system. There is need to review the relation between the lender of last resort function and who carries out inspection and regulation of the financial system.
  - The absolute sovereignty of Parliament endangers time consistency.

The strategy of the Fed

- The Federal Reserve Act was passed in December 1913.
- By the end of the First World War, the New York Fed, led by Governor Benjamin Strong, had achieved a leading role in the conduct of monetary policy.
- Benjamin Strong came to repudiate the real bills doctrine based on the experience of the 1920-21 recession, and wanted to buy and sell acceptances and government securities to control monetary conditions.
- During that recession the Fed discovered open-market operations, a major tool even today of monetary policy in the USA.

- Among the changes during the Great Depression, three were important:
  - The separation between commercial and investment banking;
  - The creation of the Federal Deposit Insurance Corporation, an innovation that fostered unit banking and reduced the incentive to capitalise banks.
  - In 1935 decision-making became more centralised and the newly named Federal Open Market Committee (FOMC) reduced the participation of the presidents of the district banks.
- The 1946 Employment Act added employment to the Fed's goals, so that it had to attend to multiple goals – maximum employment, stable prices, and moderate long term interest rates.
- War on Poverty and the Vietnam War finance forced President Nixon to close the gold window and unleashed inflation.
- Paul Volcker was appointed Chairman of the Board of Governors by President Carter and successfully brought inflation under control.
- Alan Greenspan was appointed in 1987. Under him, the Fed's focus on inflation was erratic. The 1987 stock market fall and the need to rescue Savings and Loan set the tone for a Presidency focussed on the need to counter any cyclical downturn.
- It has been suggested that the Fed in fact behaves, either consciously or unconsciously, as if implementing a "Taylor rule" (see Taylor, 1993) – adjusting the Fed Funds rate in 0.5 percentage pint steps in response to deviations 1 percentage point from 2% inflation or potential GNP.
- In recent years, with the appointment of more (academic) economists to the Board of Governors, there has been further discussion of adopting an explicit inflation target.
- The Lender of Last Resort role traditionally involved the provision of liquidity on collateral at a time of general shortage in the banking system. In the financial crisis of 2008 the US Treasury became involved in assisting the banking system. The problem could well be shortage of capital, not shortage of liquidity.
- Concluding observations:
  - The constitutional position of the Fed is anomalous and indeed unclear.
  - Of particular importance for the Eurosystem is the change in its Lender of Last Resort role.
  - The US system of financial regulation is not a system but a patchwork.

5. Policy implications for the ECB

Questions posed are: (i) Without the benefit of hindsight could monetary policy have been run in a manner that would either have avoided the present crisis or at least made its impact milder? (ii) With the benefit of hindsight can monetary policy be improved so that there is greater stability in future?

- The relative success of the ECB:
  - Inflation was above 2% in every year and averaged 2.2% in 2001-2007. It was 3.3% in 2008.
  - The ECB sets some store by having a monetary policy that is not very responsive or active but steady. However, this in itself can cause greater fluctuations in the economy as it allows booms/inflation to develop further and recessions to be deeper. An ideal policy is anticipatory but often not feasible, a lagging policy can be just as destabilising.
  - The ECB has resisted giving a clear idea of the requirement on future policy to bring inflation back into line.
  - John Taylor attributes much of the mis-setting of policy to a tendency to follow US interest rates. He also fears that, in the present crisis, the ECB follows the mistake of the Fed in believing that the cause is a liquidity crunch rather than counterparty risk.
- In times of disturbance, in addition to easing monetary policy by expanding the size of their balance sheets (quantitative easing), CBs can widen the class of assets that they accept as collateral (qualitative easing). The ECB accepts a wide range of collateral compared to many other CBs (but with heavier haircuts on lower quality assets).
  - Usually lifeboats inevitably involve the Treasury of the country concerned, because the institution at risk is so large that other banks coming together cannot commit enough means to support it, because they are themselves under stress, or because they do not recognise a common interest.
- Final recommendations:
  - In order to transmit a more comprehensive and accurate definition of price stability, the current final target as measured as a small growth of the HICP should be accompanied by a review of non-consumption goods and assets.
  - More detailed projections, as well as the public release of the model of reference of the ECB Governing Council used for their calculation, should be adopted to communicate the ECB expected inflationary bias, and thus the expected path of interest rates in the medium term.

- Generally central banks have found that small committees are more effective for making monetary policy decisions. The Eurosystem may therefore gain by appointing a small body, based on professional competence and not nationality. The composition of such committees should be based on monetary policy decision-making competence without a requirement for administrative skills as with the Executive Board.
- The Governing Council minutes, including the voting record, should be released to foster a better understanding of the different views coming into play in the meetings[1].
- Without affecting its independence, the ECB should be more accountable by making the quarterly hearing of the ECB President in the European Parliament (EP) more effective and fruitful, and better focused on the questions addressed in each session.

[1] On the question of whether the names of the individual members should be identified on the voting record there was a difference of views among the authors of this Report. All agreed on the importance of transparency but, while one insisted on full disclosure, others feared that the Governors of the national central banks might be open to the pressure from their respective Governments, if they were candidates for reappointment.

SUMMARY BOXES

Box 1: Summary of the institutional framework of major central banks				
	ECB	**Federal Reserve**	**Bank of England**	**Bank of Japan**
I. Institutional Mandate				
Clear mandate	Yes	No	Yes	Yes
Single or multiple policy goals	Single, primary target: euro area price stability	Multiple goals without weights assigned to them	Single, primary target: low inflation as measured by CPI	Single since 1998, previously multiple and not price stability
Independence:				
Who defines the numerical target?	ECB governing bodies, but no legal requirement	Not Applicable	The Chancellor of the Exchequer	BoJ but no requirement to do so
Operational independent	Yes	Ambiguous	Yes	Yes
Any competence in exchange rate regime	No, just consulting functions	Ambiguous, biased towards consulting functions only	No, just consulting functions	Yes
II. Governing bodies				
Monetary policy decision committee	Governing Council: ECB Executive Board members (6) and euro area NCB governors (16)	Federal Open Market Committee (12)	Monetary Policy Committee (9)	Policy Board: Governor, 2 deputies, 6 others from outside the bank
Appointment of members	Executive Board: After EP consultation, appointed by the Heads of State/Government of Member States; national rules for NCB governors	President of USA for Board of Governors, and Boards of Directors of Regional Federal Reserve Banks for regional bank presidents	Bank staff are appointed by Queen on advice of Prime Minister. External Members are appointed by Chancellor of the Exchequer	By government, subject to parliamentary approval

	(cont.)	**ECB**	**Federal Reserve**	**Bank of England**	**Bank of Japan**
	Term	8 years, non-renewable	14 years for Board of Governors, until retirement for others.	4 years. Renewable without limit for Governor and External members: until age sixty for internals other than governor.	5 years, renewable
	Size	22	12 (alternate members incl.)	9	9
	Decision rule	Officially by majority (President, casting vote); in practice by consensus	Majority	Majority	Majority

III. Monetary policy strategy					
	Strategy	"Two pillars": monetary and economic analyses	None clear but appears to follow a close approximation to a Taylor Rule	Inflation targeting	In effect, inflation targeting
	Quantitative definition of price stability	"HICP below but close to 2%"	None	CPI target of 2% with symmetrical range of 1 percentage point either side	CPI (ex-fresh food) between 0 and 2% year on year
	Intermediate target	No	No	No	No
	Time horizon	Medium term, not defined	Not applicable	Medium term, forecasts up to a two year horizon	Continuous, applicable all the time
IV. Transparency/Accountability					
	Parliament hearings	5 per year: quarterly "monetary dialogue" and annual report to EP (ECON Committee)	Chairman reports quarterly to Congress	To Select Committee of House of Commons quarterly, on publication of inflation report. Also Open Letter to Chancellor if target range missed	2 reports to parliament each year

	(cont.)	**ECB**	**Federal Reserve**	**Bank of England**	**Bank of Japan**
	Publication of:				
	Regular reports	Annual and weekly reports, monthly bulletin	Monthly bulletin	Inflation Report, published quarterly	Biannually and monthly

	Policy model	No	No	Bank model from time to time, but not of MPC "model"	Yes, but Board has own views
	Forecasts	No, only projections with no commitment	Yes	Yes – of inflation	Yes – range of Board's views and risks
	Minutes	No	Yes	Yes	Yes
	If yes, immediate release or delayed?	-	Delayed (2 weeks)	Delayed (2 weeks)	Delayed, not defined (usually 4 weeks)
	Full transcripts	-	No	No	With a 10 year delay
	Voting record	No	Yes	Yes	Yes
	If yes, attributed votes?	-	Yes	Yes	Yes

	Announcement of decisions:				
	Immediate press release	Yes	Has varied over time, but currently yes	Yes	Yes
	Explanation	Yes	Yes	Yes	Yes
V. Regulation and supervision					
	Role in regulation and supervision	No, decentralised to the national level. Just a coordination role	Some	None	Financial stability
	Single regulatory agency	No. Different country specific agencies (NCBs or separate bodies)	No, multiple	Yes	Yes – financial services agency, some separate treatment of securities markets
	If yes, central bank or a separated body?	-	Both central bank and separated	Separated	Separated

Box 2: Summary of the institutional framework of several central banks						
		New Zealand	**Sweden**	**Czech Republic**	**Estonia**	**China**
I. Institutional Mandate						
	Clear mandate	Set out in RBNZ Act	Yes	Yes	Yes	General
	Single or multiple policy goals	Single, price stability	Single, price stability	Single, price stability	Single, price stability	Multiple: maintaining stability of value of currency and thereby promotion of economic growth
	Independence:					
	Who defines the numerical target?	Minister & Governor – over-ride condition	Bank	Bank and government	Legislation	CPI growth target set by central economic conference among targets for social and economic development
	Operational independent	Yes with performance monitor	Yes	Yes	Yes	No
	Any competence in exchange rate regime	Yes	Yes	Yes	No	Yes
II. Governing bodies						
	Monetary policy decision committee	Governor advised by MPC and OCR Advisory Committee	Executive Board	Bank Board	Executive Board	Implements policy under leadership of State Council. Monetary Policy Committee is a consultative body
	Appointment of members	Governor by Minister of Finance, members by Government	Parliament	President of Republic	Governor by President; deputies by supervisory board	Governor appointed by President of People's Republic. Deputy governors appointed by Premier of State Council
	Term	Governor and deputies 5 years, renewable	5/6 years, renewable	6 years, renewable	Governor (7 years, not renewable) Deputies (5 years, renewable)	Not known
	Size	Not fixed 10 + (2 external)	6	7	4	13 (Monetary Policy Committee)
	Decision rule	Governor decides	Majority	Majority	Majority	Not known

	(cont.)	New Zealand	Sweden	Czech Republic	Baltic Republics (EE)	China
III. Monetary policy strategy						
	Strategy	Inflation targeting	Inflation targeting	Inflation targeting	Currency board[2]	Exchange rate target, also features of monetary targeting
	Quantitative definition of price stability	1-3% inflation over medium term	CPI inflation 2%+/-1	3%+/-1 going to 2%+/-1 by 2010	No	Not inflation targeting regime, although CPI growth target set
	Intermediate target	No	No	No	Exchange rate	M2 growth, increase in domestic credit
	Time horizon	Five years	Two years?	Two years	Continuous	Annual
IV. Transparency/Accountability						
	Parliament hearings	Yes, 4 times a year	Yes	Yes	Yes	Not known
	Publication of:					
	Regular reports	Quarterly monetary policy statement	Monetary Policy Review	Quarterly	Twice yearly	Quarterly monetary policy report, Quarterly statistical bulletin, Annual report
	Policy model	Model-driven (DSGE)	Model-driven	Model-driven FPAS	Limited	No
	Forecasts	Including policy variable	Including policy variable	Yes	Yes	Occasionally announced
	Minutes	No	Full	Yes	No	Yes, for Monetary Policy Committee (advisory body) meetings
	If yes, immediate release or delayed?	-	2 weeks	1 week		Variable
	Full transcripts	No	No	Yes (6 years later)	No	No
	Voting record	n.a.	Yes	Yes	n.a.	No
	If yes, attributed votes?	-	Yes	Yes + staff recommenda-tion		-

[2] So monetary policy is passive, and thus the Central Bank's board does not make policy decisions.

	(cont.)	New Zealand	Sweden	Czech Republic	Estonia	China
	Announcement of decisions:					
	Immediate press release	Press conference	Press conference	Yes	n.a.	Occasionally
	Explanation	Introductory statement lock up for journalists & market analysts	Statement	Press conference		Limited

V. Regulation and supervision

	Role in regulation and supervision	Banking and insurance supervisor	Financial stability	Financial supervisor	Financial stability with Supervisory agency	Separate regulator for banking sector (CBRC), but regulation of financial markets mentioned as one of CB's functions. CB has a department of financial stability
	Single regulatory agency	Securities markets separate	Yes	Yes	Yes	No
	If yes, central bank or a separated body?	-	Independent	Central bank	Agent of central bank	Separated bodies: China Banking Regulatory Commission for Banking sector, separate bodies for securities and insurance markets

INTRODUCTION

The question: lessons to be drawn from comparing the ECB strategy with that of other central banks

The object of this Report is to make a summary but informative comparison of the strategies followed by a diverse group of central banks, so that lessons can be drawn for the conduct of monetary affairs at the European Central Bank (ECB).

The institution of the central bank has become one of the commonest in the world, even more so than that of democracy. At the end of the 19th century there were 18 central banks in the world: at the beginning of the 21st this number had grown to 173. Their transformation is not only evident in their number but also in their organisation, since in recent years many central banks have seen their statutes reformed in the direction of greater independence and transparency. Growing numbers and deep changes would by themselves make the question of central bank strategy topical; the present financial crisis and economic recession have made it urgent.

The strategy of a central bank is principally the expression of its long term goals within the general economic management of a nation or a monetary zone. Beside these goals, the definition of its strategy must also include a consideration of the instruments it can use to pursue those goals; of its internal organisation; and of the institutional relations of the bank with the political powers that define its remit. All these arrangements only make sense if they are well grounded in monetary theory and in the theory of public choice: they must be based on an understanding of the limits of monetary management in a world of fast financial innovation; of time inconsistency problems afflicting all monetary authorities; and of principal-agent conflicts between central bank officials and their political masters.

To organise this complicated set of issues, we will define a central bank's monetary policy strategy by four main elements.

- The first is the desired outcome: what are the goals of monetary policy and what weight is placed on each.
- The second element is the process: how is monetary policy implemented and what instruments are used.
- The third is the assignment of responsibilities: what tasks are allocated to the central banks and how are responsibilities assigned within central banks.
- The final element is oversight: to what entity or entities are the monetary policy authorities answerable and in what manner do monetary policy-makers communicate with their supervisors and with the public.

The theoretical bases of these arrangements will be kept continually in mind to help evaluate their relevance.

1. THE THEORETICAL BASIS OF MONETARY POLICY

The most important role of a central bank is to provide a stable means of payment. This is primarily achieved by ensuring the stability of the value of the medium of exchange, although – as events in 2007 and 2008 have made clear – it may also involve assisting the relevant fiscal authorities and regulatory bodies to promote a stable financial system. At one time it was also believed that central bankers should be concerned with other macroeconomic variables, such as employment and long-term growth. Today, however, most new central bank legislation in advanced economies mandates price stability as the overriding goal of the central bank. In many cases, central banks or their governments go as far as setting explicit numerical targets for inflation.

In this chapter we discuss how an evolving theoretical view of monetary policy led to a consensus that central banks should be primarily concerned with inflation and also to a widely shared belief that, left to themselves, central banks would inflate too much. We describe attempts to devise institutions that would ensure good policy-making and protect societies from this inflation bias.

1.1. Evolution of desired objectives

As already mentioned, for most modern central banks, the provision of low inflation is seen as the primary goal. It may not be completely obvious why inflation is seen as so costly as to merit this importance and, therefore, we present some of the reasons. We then explain why other macroeconomic goals, such as employment and output or a stable exchange rate are typically given less or no importance in many central bank mandates.

1.1.1. Inflation has high costs

Inflation is defined as the percentage increase in the general level of prices of goods and services in an economy over a period. For purposes of monetary policy, inflation is typically measured as the percentage increase in a consumer price index, such as the Harmonised Index of Consumer Prices (HICP) used in the EU Member States. A consumer price index is the weighted average of the prices of goods in a typical household's consumption basket.

The classical cost of inflation is the shoe-leather cost. The opportunity cost of holding non-interest bearing money is the nominal interest rate. The higher inflation is, the higher is the nominal interest rate and the more resources households and firms expend to avoid holding money. A second cost is menu costs: if prices change, then menus and other price lists must be updated. A third cost arises with staggered nominal price setting. Often firms set prices in advance and keep them unchanged for some time. If not all prices are set simultaneously, then inflation may cause relative prices to be distorted. A fourth way that inflation is harmful is that inflation makes the currency an inconvenient unit of account; a yardstick is not as useful if its size keeps changing. A fifth cost is that inflation can interact with the tax system in a way that produces distorted or unfair outcomes. For example, in years of high inflation, people may pay capital gains taxes on capital losses. Finally, inflation can redistribute income in a way that is regarded as unfair: the sophisticated and relatively wealthy gain at the expense of the poor and the badly educated.

Measuring the exact cost of inflation is difficult. There is, however, a substantial literature looking at the relationship between inflation and growth. The evidence leaves no doubt that double-digit inflation is bad for growth, but there is some controversy about the effect of low inflation on growth.[3]

1.1.2. There is no long-run trade-off between inflation and employment and output

Despite the long-recognized costs of inflation, the belief that low inflation should be the primary, and possibly even the *overriding*, mandate for a central bank is a product of the past three or four decades. At one time, central banks were expected to pursue both low inflation and high employment and output. Even now the Federal Reserve is formally charged with pursuing "maximum employment" in addition to price stability. That high employment and output are desirable seems clear, so why should they, too, not be part of a central bank's objectives?

In the 1960s most academics and policy-makers believed that there was a long-run trade-off between inflation and unemployment and output; society could enjoy a higher level of economic activity if it were willing to tolerate the higher inflation. It was thought that monetary policy involved weighing the benefits to those better off by higher growth and employment against the costs to those worse off by higher inflation.

By the end of the 1960s, the belief in a stable Phillips curve relationship between inflation and unemployment had waned. Edmund Phelps (1970) argued that, although monetary policy can have a significant temporary effect on the economy, it has little long-run effect on employment and output. Since the rational expectations revolution of the 1970, the prevailing, indeed near-consensus, view is that there is no long-run exploitable trade-off between inflation and unemployment and output, except *possibly* at very low levels of inflation. (We will return to this exception later.)

1.1.3. There is a relationship between unexpected inflation and employment and output

While it is generally thought that there is no exploitable Phillips curve trade-off between inflation and employment and output, it is believed that there is a positive relationship between *unexpected* inflation and employment and output. This can arise with rational expectations if there is nominal wage contracting. To see this, suppose that workers and firms choose a contractual nominal wage that will be fixed for some time in the future. Monetary policy is then made and the resulting inflation determines the real wage over the term of the contract and firms make their hiring decisions based on this real wage. At the time that they contract, workers and firms choose a nominal wage such that, given their expectation of inflation, they will attain their most preferred level of employment. In this case, the higher unexpected inflation is, the lower is the real wage and the higher is employment, and thus output. This relationship between unexpected inflation and employment and output is often called an *expectations-augmented Phillips curve*.

An implication of this expectations-augmented Phillips curve is that monetary policy might possibly be used to smooth business cycle fluctuations if the central bank has an informational advantage over the private sector. Such an advantage may be present if the private sector commits itself to fixed nominal wage or fixed nominal interest rate contracts and a shock occurs after these contracts are signed and before monetary policy is applied.

[3] See Bernanke (1999) and Fischer (1996)

Milton Friedman and the monetarist school, however, questioned even a short-run stabilisation role for monetary policy, claiming that there are long, variable and uncertain lags between the implementation of monetary policy, when its effects occur and how systematic they are.

1.1.4. Monetary policy is subject to a time-inconsistency problem

An unfortunate implication of the relationship between unexpected inflation and employment and output is that it creates an inflation bias. Once workers and firms have formed their expectation of inflation and incorporated it into nominal wage contracts, benevolent policy-makers can increase employment and output by increasing inflation. However, at the time that the public forms its expectation of inflation, it understands the policy-maker's incentives and expects the resulting inflation to occur. The outcome is that there is inflation, but rational expectations imply that on average inflation fully enters expectations. The central bank cannot systematically engineer an increase in employment and output above what would occur with no unexpected inflation. This is the time-inconsistency problem, developed in the academic literature by Kydland and Prescott (1977) and Barro and Gordon (1983).

There is a related time-inconsistency problem for countries with inefficient tax systems. In this case, public finance considerations may cause a benevolent policy-maker to want to collect an inflation tax and the amount that it can collect is increasing in unexpected inflation. Thus, once the public forms its expectation of inflation, the policy-maker has an incentive to increase government revenue by causing inflation and the public realises this. The outcome is inflation, but this is expected, not unexpected inflation.[4]

In both of the above time-inconsistency scenarios, the policy-maker and society would be better off if the government could commit itself to not inflating. In this case there would be no unexpected inflation. Employment and output or government revenue would be the same as in the time-inconsistency scenarios and there would be no inflation.

1.2. Designing institutions to ensure price stability

As a consequence of the view that low and stable inflation is desirable, that monetary policy cannot be used to systematically increase employment and output, and that long and variable lags in monetary policy limit it usefulness in offsetting transitory shocks it is now common to mandate price stability as the principle goal of the central bank. The ECB, the Bank of England, the Bank of Japan, the Bank of Korea, the Bank of Canada, the Banco Central do Brazil and the South African Reserve Bank are among the many central banks that have price stability as their legislated primary goal.

Given the time-inconsistency problem, however, it is not enough to mandate the pursuit of low inflation. The government must find some way to commit itself to low inflation. Unfortunately, however, as law-maker, judge and enforcer, it is difficult for a government to compel itself to behave in a particular way.

Governments can try to solve the credibility problem in monetary policy in three main ways. The first is to find a way to make it more costly to policy-makers to cause inflation. The second is to sidestep the problem by appointing policy-makers who are so inflation-averse that they are not tempted to use inflation to increase output. The third is more subtle.

[4] See Calvo (1978).

If a policy-maker were to resist the temptation to inflate early in his tenure in office, the public might think it possible that the policy maker is highly inflation-averse and it would expect low inflation in the future. Thus, a policy-maker's desire to gain a reputation for being tough on inflation might serve as a commitment device. Unfortunately, as policy-makers serve finite terms, at some point before the end of their tenure they are likely to exploit a reputation for inflation aversion by creating more inflation than is expected. Thus, this last solution is only a partial one. In this section, we consider how different monetary policy institutions have been used to solve the credibility problem.

1.2.1. Fixed exchange rate regimes

One strategy for insuring low inflation is for a government to peg its currency to the currency of a country that can be counted on to pursue low inflation. It is a central result in the theory of international finance that if a country is to maintain a fixed exchange rate, it cannot follow an independent monetary policy.[5] Thus, as long as the country maintains its peg, it must follow the less inflationary country's monetary policy. The formation of the Exchange Rate Mechanism (ERM) of the European Monetary System can be viewed as an attempt by other nations to attain the same rate of inflation as Germany. Many developing countries have pegged their currencies to the dollar with the intent of achieving the lower US inflation.

As long at it has enough foreign reserves to buy back its monetary base it is always *possible* for a country with a fixed exchange rate to maintain its peg. Policy-makers may be able to commit to pursuing the monetary policy necessary for maintaining a fixed exchange rate, at least for a while, because devaluations can cause severe economic disruption and are not a career-enhancing move for the policy-maker involved.

There are drawbacks to fixed exchange rates, however. One problem is that the link between the exchange rate and inflation is imperfect. Successfully maintaining a peg does not necessarily guarantee price stability. More importantly, however, in a world with highly mobile capital, fixed exchange rates are subject to speculative attacks; this is so when the fundamentals are weak but, as with bank runs, these attacks may occur even when the fundamentals are relatively good. If holders of the domestic currency think that there will be a successful speculative attack, then they sell the domestic currency. Although it may be feasible for the country to avert the attack, if doing so is too damaging to the domestic economy; the government chooses to devalue and market participants' expectations are self-fulfilling. Sterling's spectacularly ungraceful exit from the ERM in September 1992 – the Bank of England reportedly suffered a capital loss of $5 billion in just a few hours[6] – was probably the death knell for fixed exchange rate regimes in most advanced economies.[7]

Some developing, transition and very small economies still opt to peg their currencies. This is because developing and transition economies are especially vulnerable to the time-inconsistency problems associated with inefficient tax systems and because it is particularly difficult to make monetary policy in very small economies.

A currency board is probably the most successful and credible type of peg for countries that choose to fix their exchange rate. Under a classical currency board the government pegs its currency to a foreign currency, say the euro.

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[5] The only exception is a country with an important reserve currency. The United States under the Bretton Woods system is an example: although the dollar was pegged to gold, it was able, up to a point and for a limited period, to pursue an overly expansionary monetary policy because other governments were willing to accumulate dollar reserves.

[6] See Obstfeld and Rogoff (1995).

[7] Denmark is a counterexample; it pegs its currency to the euro.

It then stands willing to buy and sell unlimited amounts of its own notes and coins for euros at the pegged rate and it holds enough euros to buy back all of its own notes and coins. It does not otherwise pursue any monetary policy: it does not attempt to influence interest rates, fund the government or act as lender of last resort to its banking system. The advantage of this system is that if the government adheres to it, it can maintain its peg. Lithuania is an example of a country that has operated a successful currency board since 2000; Argentina is an example of a country that operated a currency board, but was unable to commit to the rules and suffered a financial meltdown in 2001-2002.

An extreme, but credible way for high inflation countries to commit to a less inflationary monetary policy is to give up their own currency. Examples are countries such as Italy and Greece that joined the European Monetary Union (EMU); Ecuador, which dollarized in 2000 and Montenegro, which adopted first the German mark and then the euro as its currency. The option could also have considerable benefits for countries that are too small and vulnerable to external shocks to achieve stable inflation, even if they could commit to attempting this.[8]

1.2.2. Inflation Targeting and Central Bank Independence

It is widely believed that a good way to ensure price stability in a sizable advanced economy is to make the central bank operationally independent of the government and to give it an inflation target. This is the reasoning behind the wave of central bank legislation that introduced inflation targeting around the world. The Norges Bank, Sveriges Riksbank, the Bank of England, the Banco Central do Brazil are among the central banks that must meet an explicit inflation target set by the government. Perhaps less appealing are looser variants of this: the Bank of Korea can choose its own target; the South African Reserve Bank is given a band rather than a point target; the ECB is merely enjoined to keep inflation low.

Making the bank operationally independent does not necessarily solve the time-inconsistency problem. If the central bank shares the government's preferences, it will have a time-inconsistency problem as well. However, Bernanke et al (1999, p. 25) argue that central bankers are apt to be more inflation-averse than the government, saying that this, "… may be the result of 'tough' central bankers … or it may just be that their professional backgrounds and socialisation make central bankers relatively hawkish on inflation."

1.2.3. Intermediate Targets

An explicit inflation target has been praised as a simple, visible, verifiable, easily understood and rarely changing goal that permits central bankers' to enhance their reputation for being tough on inflation. Unfortunately, however, if inflation is too high, the public may not be able to tell whether the central bank has an inflation bias arising from the time-inconsistency problem or is just incompetent or unlucky.

Central banks have various instruments at their disposal with which to try to attain their desired level of inflation. These include open-market operations, discount rates and reserve requirements. A motivated member of the public might attempt to infer from open-market operations, reserve requirements and discount window rates whether or not the central bank is being too expansionary, but the relationship between these instruments and inflation is highly complex.

[8] Countries such as the Baltics and Iceland would benefit in the short run from unilaterally adopting the euro and may only be deterred from doing so because it might preclude their entry into the euro area.

Even the central bank might find it difficult to infer undue expansion from the values it sets for these instruments. Since it is difficult to know what level of a particular instrument will be most apt to produce a given inflation rate, central banks often use *intermediate targets*; that is, the central banks target variables that are both more directly related to inflation than their instruments and easier to target precisely using their instruments than inflation itself. As many economists believe that there is a stable long-run relationship between money and inflation, monetary aggregates were a popular intermediate target in the 1970s and 1980s and were used by the German Bundesbank and the Swiss National Bank.

A problem with this regime is that its merits depend upon the short-term and medium-term relationships between the monetary aggregates chosen as targets and inflation. Currently, these relationships are not stable or predictable enough for monetary aggregates targeting to be a good way of ensuring that inflation is low and not too variable. In addition, the targeting of monetary aggregates is relatively hard for the public to understand, making it more difficult to acquire and maintain a reputation for inflationary toughness. The success of the Bundesbank in maintaining low inflation may have been due to its legendary inflation aversion, rather than properties inherent in this framework. Bernanke and Mihov (1997) use data from 1969–1995 to argue that the Bundesbank would have been better described as an inflation-targeter than as a money-targeter.

The ECB originally assigned a prominent role to the broad monetary aggregate M3, stating that it would announce a reference value for M3 that would be consistent with price stability. While the Governing Council of the ECB did not commit to always meeting this target in the short run, it stated that deviations would signal a threat to its low-inflation objective. This policy was probably intended as a mechanism for the ECB to communicate its monetary policy to the public. However, as M3 regularly exceeded its reference value the policy served only to undermine the ECB's credibility. On 8 May 2003, to the near universal approval of academic economists, the Council announced that M3 no longer had a special role.[9]

While it is neither surprising nor regrettable that the targeting of monetary aggregates has been abandoned, it may seem somewhat curious that money is of so little importance in modern monetary policy-making. There is a well-established connection between monetary base creation by central banks and the rate of inflation in the long run. Mervyn King (2002) calculates that over the 30-year horizon 1968–1998 the correlation coefficient between both narrow and broad measures of money and inflation was .99. Yet, money plays no role in the canonical New Keynesian macroeconomic model that is en vogue today and, as Mervyn King (2002) comments, econometric forecasting models in most central banks do not include money.

The problem is that, as previously mentioned, the *short-run* correlation between money and output is small and unstable so that reduced-form models are of little use. Estrella and Mishkin (1997) and Stock and Watson (1999) find that money growth has little or no useful information for inflation forecasting. Nevertheless, some prominent economists, such as Charles Goodhart (2007), believe that matters have gone too far; that paying attention to money, especially in times of turbulence, is important. Not all economists have despaired of developing structural models that would enable the extraction of information from monetary aggregates – see Chadha et al (2008) – but, this research is in its infancy.

[9] See Svensson (2003) and Wyplosz (2003). Gerlach and Svensson (2003) find that the growth of M3 appears to have no predictive power in forecasting future inflation. Woodford (2007) argues strongly against a special importance for money in policymaking.

Because of the problems with monetary aggregates, most inflation-targeting central banks have adopted short-term interest rates as intermediate targets. Monetary policy-makers make monetary policy by announcing a policy interest rate and then having the central bank staff conduct liquidity management operations to attempt to ensure that the announced policy rate coincides with some reference interest rate[10]. Thus, central bank short-term interest rates often play a double role in central bank policy: they serve as intermediate targets and they are used to signal the central bank's monetary policy stance to the public.

1.2.4. A single precise goal helps to promote efficiency in monetary policy committees

The discussion so far has relied on purely macroeconomic arguments to explain why most central banks have and should have low inflation as their primary goal. We now present a less orthodox reason for this and a reason why specific numerical inflation targets may be desirable. In most central banks, monetary policy is made by a committee, usually a fairly sizable committee. A prominent feature of committees is that their output is not as good as what would be suggested by the capabilities of their members. Kerr and Tindale (2004) comment, "The ubiquitous finding across many decades … is that groups usually fall short of reasonable productivity baselines … they exhibit process losses." The process losses appear to result primarily from coordination problems and free-riding.

Coordination problems lead to significant process losses in large groups. A monetary policy committee faced with multiple aims may waste its time arguing over what weight to put on each goal, rather than how best to achieve its goals. Members may withhold information to manipulate the outcome strategically. A precise specification of the committee's objectives is apt to result in a more efficient process and more inter-committee cooperation. From the point of view of efficient policy-making, a single objective for monetary policy committees may dominate multiple objectives and if the sole objective is price stability, a point target may be better than a more vague specification.

A vast social psychology literature documents the problem of "social loafing", or free-riding, in committees. This problem is especially severe in larger committees and appears to disappear only when the contributions of individual members can be identified and compared.[11] For mitigating social loafing by monetary policy committee members, it appears that a single precise goal, coupled with the release of individual votes is ideal.

From a point of view of efficiency, the Bank of England scores well: its relatively small monetary policy committee is mandated to pursue a point target for inflation and votes are taken and published. The Federal Reserve's FOMC and the Governing Council of the ECB are less well designed. Both committees are far too big. The Federal Reserve has multiple, poorly specified goals and while votes are taken and published, members usually feel compelled to vote with the chairman so they are not usually informative. The ECB has a single, fairly clear goal, but as votes are not published, and may not even be taken, there is no way to evaluate an individual member's contribution.

[10] For many central banks the policy rate and the reference rate coincide. The ECB does not have a formal reference rate, although the EONIA rate, a benchmark unsecured overnight rate may be an informal reference rate. The ECB's policy rate is the minimum bid rate on its main refinancing operations. Unusually, the Swiss National Bank uses the three-month uncollateralised interbank interest rate as both its policy rate and its reference rate.

[11] See Harkins and Jenkins (1985).

1.2.5. In an advanced economy, the inflation target should be between 1 and 3%

To attain price stability, the arguments advanced earlier in this chapter suggest that central banks should have a target inflation rate that is equal to zero, or possibly even one that is small and negative (so that the nominal interest rate is equal to zero). Most advanced economies, however, favour an inflation rate between one and three percent. We suggest some reasons why this is sensible and explain why less advanced economies might choose a higher inflation target.

In addition to the costs of inflation that we have identified, there may be a benefit. Printing more money causes inflation, but it also provides the government with revenue, known as seigniorage. This tax on the holding of money is believed to be distortionary relative to other taxes, but has no significant administrative costs. This suggests that, from a public finance point of view, for modern economies the optimal inflation tax is near zero, but might even be in the double digits for some less developed economies, such as those in the early stages of transition or, possibly, for economies with extraordinary fiscal needs arising from, say, a war.

Further, it is sometimes argued that the costs for deviating from inflation are asymmetric: because of its redistributive effects on debts and the real resource costs of the resulting bankruptcies, low deflation is more harmful than low inflation. This suggests that the inflation target ought to be positive. It may be, however, that as the world becomes more used to very low inflation that this asymmetry will disappear.

The two most important reasons for having an inflation target greater than zero arise from practical considerations in the implementation of monetary policy and measurement error. It is difficult, although not necessarily impossible, to have a nominal policy rate below zero and thus it might be difficult for a central bank to offset an unexpected negative shock if actual and expected inflation were near zero. In most countries the consumer price indices used to compute the central bank's measure of inflation significantly exceed actual inflation.[12]

It is sometimes suggested that a final possible reason that some inflation may be desirable is that, as mentioned previously, it is conceivable that there is a Phillips curve trade-off at sufficiently low inflation.[13] The trade-off would arise if there is downward wage inflexibility. This seems plausible; it is believable that workers are disproportionately averse to a cut in their nominal wage. However, the empirical evidence of this phenomenon is inconclusive. Lebow, Stockton and Wascher (1995), for example, argue that nominal wage cuts are common in the United States. Moreover, aversion to nominal wage cuts is not a necessary feature of an economy and may disappear as workers and firms become more used to low inflation.

Throughout this chapter we have taken price stability to mean low and stable inflation. An obvious alternative definition is a constant level of the consumer price index. Current inflation would be offset with future deflation. Stabilising the value of the consumer price index has not proved a popular idea and was last tried by Sweden in the 1930's.[14] There are few, if any, mainstream economic models where welfare depends upon the price level.

[12] In the United States, for example, the CPI may overstate inflation by over 1.5 percentage points. See Hamilton (2001), Costa (2001) and Hausman (2003).
[13] See Akerlof et al (1996).
[14] See Murray (2006).

1.2.6. Rules vs. discretion or, there may be a trade-off between credibility and flexibility

Devising institutional structures that force central bankers to focus on inflation to the near exclusion of employment and output is not costless. While it is not possible for central banks to *systematically* increase employment and output, as discussed earlier, it is theoretically possible, although practically difficult, for central banks to offset transitory random shocks if they have an informational advantage over the public. That is, there may be some stabilisation role for central banks. Central banks cannot affect the levels of real variables, but perhaps they can affect their variances. If the central bank is unwilling to tolerate any variance in inflation, however, it will be unwilling to smooth real variables.[15]

A sizable body of research has grown around the problem of designing a central bank that is both credible that it will pursue low inflation and flexible enough to respond to shocks. Walsh (1995) shows that a properly specified incentive contract, providing monetary bonuses to central bankers who provide low inflation and penalties to those who do not can solve this problem. To write such a contract, however, requires that the government has an unrealistic amount of knowledge about the central banker's preferences. Briault et al (1997) also argue that giving the government responsibility for enforcing the contract simply shifts the time-inconsistency problem from the central bank to the public. As a result of these problems, we do not know of real world examples of such contracts.

In practice, however, the prevailing view is that using monetary policy to offset small shocks is too difficult. The central bank's knowledge of the economy is incomplete. The available data is constantly subject to revisions. Monetary policy operates with too long and too uncertain lags and its effects are too hard to quantify. Using monetary policy to fine-tune the economy is not possible.

This does not mean that a central bank should permit or create unnecessary turbulence in employment or output. If some large, visible event created a collapse in domestic demand, it might be that the central bank ought to pursue a more expansionary policy than would be sufficient to ensure price stability. In the face of a sufficiently large and visible supply shock, say a rise in the price of oil, there could be a case for the central bank not to pursue a monetary policy that is contractionary enough to ensure that it hits its inflation target. If the communication strategy of a central bank is good and if a central bank has a reputation for inflationary toughness, then failing to pursue its mandate to the letter in the face of a rare, large, easily observable event should not cause a serious problem.[16]

[15] The classic theoretical reference is Rogoff (1985).

[16] In some countries legislators have put escape clauses into central bank legislation. In New Zealand, the government can override the Reserve Bank in "extraordinary" circumstances; in "extreme economic circumstances", the UK Treasury is allowed to instruct the Bank of England for a limited time. These arrangements merely shift the time-inconsistency problem back to the government. A government that wants to intervene in normal times may have an incentive to define normal circumstances as extraordinary.

2. A SHORT REVIEW OF THE EVOLUTION OF MONETARY STRATEGIES IN RECENT DECADES

2.1 The discretionary paradigm of the post-WWII years: the Bretton Woods fixed exchange system, and its breakdown and the pros and cons of flexible exchange rates

The 20th century is the period of the growing dominance of monetary arrangements by central banks. Much has changed from the time at the beginning of that century, when central banks of the leading nations followed the fixed rules of the gold standard, to the present day when they have discretionary and growing powers. These powers have been to good effect in bringing down and maintaining low inflation and helping to establish a period of sustained growth. With those powers, however, has come the possibility of doing much harm and matching the powers has been a drive for transparency of action and accountability. The present crisis may provide an assessment of the success of this balance.

2.1.1. The Bretton Woods fixed exchange system and its breakdown

The economic reconstruction of a world racked by war included the task of restoring the international payment system, which had broken down in the thirties after the general abandonment of the discipline of gold. The return to currency and trading blocks, with the consequent implosion of trade, was to be avoided at all costs. At Bretton Woods in 1944, a hybrid system was created that tried to combine the advantages of the gold standard while avoiding its defects. The aim was to restore full convertibility of the main currencies at fixed but (exceptionally) variable exchange rates. Competitive devaluations, the plague of the thirties would be ruled out, though parity changes would be permitted by agreement in the event of fundamental maladjustments. A supervising authority, the IMF, would supply interim funds to deficit countries while imposing plans to bring their balance of payments back to equilibrium. This meant that countries would never be forced to deflate. It also meant that there was less need to control trade to avoid large deficits in the foreign balance.

The Bretton Woods system worked reasonably well until the first oil crisis of the 1970s, but there were earlier attempts to replace it[17]. There had been an early and failed attempt to make sterling fully convertible, principally because the exchange rate chosen overvalued the pound. But then, during the 1960s, the US Fed was allowed to act responsibly by the US Treasury: the Fed in fact kept the rules of the gold standard, as implied by the dollar being convertible into gold at $35 an ounce, even if the gold window was only open for other central banks.

To behave responsibly meant choosing two elements of the so-called “Bretton Woods trilemma”. This trilemma expresses a fundamental restriction of international financial sovereignty: countries cannot at the same time maintain exchange rate stability, stay open financially and commercially, and exercise monetary independence. In the 1960s, as was just noted, the US Treasury followed an orthodox fiscal policy that allowed the Fed to limit money creation at a rate that did not undermine the exchanges.

[17] In Europe, the *Werner Committee* was created in 1970 to replace the Bretton Woods system.

However, the escalation of Federal expenditure with the Viet Nam War and Johnson's War on Poverty pushed the Treasury slowly to reduce financial openness, with the Interest Equalization Tax and other policies with effects analogous to capital controls. In 1971 Nixon was forced to close the gold window and allow the dollar to float. The UK soon followed suit and the whole edifice crashed beyond repair with the 1973 oil crisis.

2.1.2. The pros and cons of flexible exchange rates

As early as 1953, Milton Friedman published a paper calling for flexible exchange rates rather than fixed as obtained under the Bretton Woods system. This idea changed the panorama of macroeconomic policy completely. If exchange rates were freely determined by markets, there would be no need for controls to be imposed on exchanges, capital movements and trade for keeping the balance of payments in equilibrium. These ideas were slowly put into practice, especially after Margaret Thatcher lifted all exchange controls suddenly in the summer of 1979 and no catastrophe occurred.

At present, the world economy functions based on floating exchanges and financial globalisation. This has the advantage of reducing the need for distorting Government interventions in capital and commercial movements but is proving to have some drawbacks.

The first drawback is the temptation of "dirty floating", of central banks intervening in exchange markets to keep the national currency undervalued, to make national products more competitive and follow a path of export-led growth. The trouble with this kind of policy, akin to those that led to the competitive devaluations of the thirties, is that it leads (a) to international friction, and (b) eventually to internal inflation: it is difficult to sterilise the reserves accumulated by a continuous payments surplus, so that in the end their counterpart increased the internal money supply. This is what was happening in China until the present world recession started to depress prices all round the world. Only a compensating outflow of capital investment of the kind witnessed in Japan could avoid domestic price rises as the equilibrating factor.

The second drawback is that fast moving hot money can be destabilising, especially for small currency zones. Speculative capital can flow in overwhelming amounts when investments or interest rates look attractive. Then, if the macroeconomic situation changes, capital outflow leads to sharp currency depreciations. True, these depreciations may be a response to mistaken policies or defective institutions but they impose such sharp social costs that the political backlash can be destructive. The case of Iceland in 2007-8 is an example of such a process. That is why some small countries prefer to link their currencies to that of a large monetary zone by means of a currency board arrangement and carry out the fiscal and institutional reforms at a faster pace: this is what Lithuania has chosen to do. Other small countries simply choose to give up their national currencies and dollarise/eurorise, as Panama has done for the US dollar and Montenegro for the euro, or join the euro, as Slovakia, Slovenia, Malta and Cyprus have done. In sum, a monetary zone has to be of a minimum size and small zones are even more bound to apply orthodox fiscal and monetary policies: only thus can they hope to withstand the socially destabilising effects of transversal shocks and panicked withdrawal of foreign capital. The destabilising effects of monetary and exchange rate shocks should not lead one to forget the advantages of having different competing world currencies, with freely floating exchange rates: such a regime should allow the authorities governing a currency to avoid the unwanted repercussions of imprudent policies of the authorities of another. As Friedman put it in (1953),

> "[A] system of flexible exchange rates eliminates the necessity for [a general] far-reaching co-ordination of internal monetary and fiscal policy in order for any country separately to follow a stable internal monetary policy" (p. 199).

A single world currency with no anchor would pose a high risk of inflationary abuse. Monetary competition, at least among large international currencies, is necessary to isolate one's monetary authority from the imprudent behaviour of others. True again, the possibility of investing abroad inherent in a system of free capital movements does expose the financial system of one zone to the uncontrolled risks created in another, as we have seen during the present world crisis. This makes it more imperative that the central bank of each zone be in charge of regulating, supervising and settling financial operations in its backyard.

2.2. Two successive policy consensus for managing purely fiduciary money systems: "monetary targeting" vs. "inflation targeting"

2.2.1. The escape from discretionary policy-making since the 1970s

The general implementation of discretionary economic policies in the developed countries after the Second World War ended in higher inflation and higher market volatility in the late 1960s and finally in recession during the crisis of the early 1970s. After decades of a typical Keynesian economic policy mix, which comprised the design of discretionary active fiscal policy and government control on the money supply growth, the developed economies during the 1970s experienced both higher unemployment and higher inflation. This adverse policy outcome was a true challenge for the mainstream Keynesian theoretical models; by which inflation was either a cost- push phenomenon or just the result of an excess of aggregate demand in relation to the potential of the economy. Within this academic and policy framework, monetary policy, on the one hand, acted as a mere subsidiary political instrument designed to finance the desired fiscal policy; and the government, on the other hand, actively used discretional fiscal policy as if it were an effective tool to manage aggregate demand and, thus, employment and output.

After the failure of this type of active discretionary strategies, policy-makers started to pay more attention to the new consensus in the academia. As mentioned in Chapter 1, a decade earlier economists such as Friedman or Phelps, among others, had criticised the basis of the traditional *Phillips curve*; thus denying the existence of a politically exploitable, or a sustainable relationship, between the rate of inflation and unemployment.[18] Not only their academic findings, but most importantly, the empirical evidence of the disruptive effects from the implementation of unrestricted and countercyclical fiscal and monetary policies, supported a major revision of the policy goals and the policy strategy; and, finally, led to a true change in the policy paradigm.

Regarding monetary policy, the result of this major change of paradigm, first in academia and then in politics, was the adoption of new rules to (1) restrict the scope and goals of monetary policy, and (2) give more autonomy and independence to central bankers. The aim was to prevent politicians from interfering in ordinary policy-making to avoid a short-run driven monetary policy and reinforce the commitment to a long-term goal.

[18] Of course Bill Phillips (1958) never claimed that there was any such option when presented the curve originally.

In the following lines, we will discuss two of the most relevant practical attempts to conduct a non-discretional monetary policy[19]; which can be taken as the two alternative references for a rule-based monetary policy: the so called "monetary targeting" and "inflation targeting". These two types of rules led to two successive policy consensuses for conducting non-discretionary monetary policy in practice and, to some extent, still are competing references in academia.

2.2.2. The rationale of "monetary targeting": inflation/deflation as monetary phenomena in the medium term

Following the classical monetarist tradition, M. Friedman (1956) developed a new explanation of the money demand function as part of the *quantity equation*. According to his restatement of the *quantity theory*, agents can allocate their total wealth to alternative assets (including, money, variable or constant return financial assets, real assets and human capital). Further and in view of the available empirical evidence, he underlined the stability of the desired money ratio to income, as mainly depending on individual preferences, habits and other institutional factors. For this reason, an increase of the supply of money alters the agent's cash ratio above its desired ratio, thus triggering portfolio decisions to get rid of the excess of liquidity. In particular, because of the excess of money, agents will increase their demand for other real and financial assets, as well as their demand for final goods and services, until they reduce their liquidity to the desired ratio. As a result of those portfolio adjustments, the injection of more money will raise prices; which underlines the relation between the excess of money in the market and the expected upward change in the price level.

Friedman's restatement of the *quantity theory* formed the theoretical basis of a new monetary rule; one by which the control on money growth was considered as the best way to achieve price stability in the medium and long term. To do so, the central bank should (1) choose the monetary aggregate most correlated with inflation, and then (2) fix a money rate of growth according to the quantity equation:

All variables expressed in rates of growth, the quantity equation states that: $M+V=\Pi+Y$. So, taking the estimated values for money income velocity (V) as stable, a true zero inflationist oriented policy ($\Pi = 0$) required liquidity (M) to grow at the same rate as the real output (Y) of the economy. The following of this simple and easy to interpret rationale produced a money growth rule compatible with price stability, commonly known as the "k% Friedman's rule". The practical proposal of a monetary rule thus defined required (1) a reliable relation between the selected monetary aggregate, as the intermediate target, and inflation, as the final policy target, and (2) a stable money demand function[20], at least in the medium and long term.

By adopting a credible and medium-term oriented strategy through espousing this type of rules goes some way to solve the time-inconsistency problem (Kydland and Prescott 1977, Barro and Gordon 1983), and provides a commitment to achieving price stability and avoiding active and frequent interventions in the markets.

[19] Exchange rate targeting is another attempt to conduct a non-discretional policy; and it will be discussed in Chapter 4 within the description of alternative monetary strategies of several central banks.

[20] As stated by Friedman (1956, p. 16), the running of the quantity equation did not require V to be constant, but a stable money demand function. In fact, as Friedman and Schwartz (1963) showed, money velocity follows an expected stable decreasing pattern in normal times.

With these rules, the announcement of the central bank final inflation goal for a defined time horizon was followed by the communication of the money growth (intermediate) target needed to achieve the inflation target. As a result, and in the absence of exceptional factors affecting the economy, the central bank determined the money supply growth appropriate to fulfil its target for a defined time period (frequently a year); this in effect is a non-reactive rule. However, as we will see below, the adoption of this strategy did not totally tie the hands of the central bankers during that period, allowing for a certain, but limited, degree of flexibility.

These monetary rules were implemented in the late 1970s and early 1980s, and the long experience of the *Bundesbank* is the most relevant, both because of its successful record of price stability for more than 20 years, and for its major influence on the decision of the monetary strategy initially adopted by the ECB in 1999.

2.2.2.1. The Bundesbank *"monetary targeting" experience from the 1970s*

In 1975 the *Bundesbank* adopted a target value for money growth as the intermediate target of a policy strategy committed to maintaining (domestic) price stability; as clearly mandated by its statutes. From 1979 to 1999, the strategy of the *Bundesbank* evolved to announcing a corridor for money growth compatible with its inflation target. First in the form of a narrow definition of money (M1) until 1987, and afterwards choosing a broader measure such as M3, the *Bundesbank* formally adopted an intermediate band target for money growth as an essential element of its monetary policy strategy. In doing so, the central bank not only published its intermediate and final targets, but also provided regular communication channels to explain the rationale of the strategy to the general public; which was a key element of its communication and transparency policy. In fact, with the regular announcement of the targets, the central bank was able (1) to explain the most important variables behind the calculation of the liquidity target, (2) to underline the relation of this intermediate target with the final target within a medium-term oriented policy and, so, (3) to enhance its commitment to achieve the inflation target.

The announcement of an intermediate target band for money growth clearly evidenced the need to keep some flexibility in the running of this strategy. Given the uncertainty surrounding the forecasting of variables such as money velocity or output growth, even in the short term, conducting a credible "monetary targeting" strategy required the adoption of an intermediate band target; and not a single value. From 1979 to 1999, the width of the corridor for money growth conveyed the degree of uncertainty of the *Bundesbank*; which consisted of 2 or 3 percentage points. Following this strategy, persistent deviations of money growth from the target band were taken as priority signals of medium-term price mismanagement; and, thus, deviations of money growth from the intermediate target were taken as the primary (but not the only one) information set used to correct in advance expected deviations from the inflation target. Occasional short-run deviations of liquidity from the announced band, if considered temporary, did not have to be followed by an automatic reaction of the *Bundesbank*.

Meeting the money growth corridor was not a target *per se*, but a way to achieve the final price stability target. Accordingly, if unexpected events affected the economy, the *Bundesbank* could, and in fact did, conduct a monetary policy different from the one needed to achieve the intermediate target. As a result, the non-fulfilment of the announced band for money growth was tolerated when unexpected factors pushed inflation away from its target.

However, though permitted, the *Bundesbank* had to explain the exceptional reasons that caused the non-fulfilment of the band for liquidity growth, as well as the expected time required to return to the announced rule[21]. Otherwise, the constant appeal to extraordinary factors in the event of a persistent deviation from its intermediate target could soon be interpreted as an implicit discretionary policy; which would have resulted in the loss of credibility of the central bank and, thus, in the virtual ineffectiveness of the rule as a monetary anchor. In this sense, the central bank retained some room to depart from the announced rule, but it was not a free margin.

Even though the *Bundesbank* achieved the final inflation target during this period, it only met the intermediate target 10-13 years out of 24. This means that, at least for 11 years, the bank conducted its price stability monetary policy but without following the prescriptions of money growth in relation to its target. According to Bofinger (2001, p. 298), the *Bundesbank* systematically chose too low money growth targets "to provide the central bank with a protective shield against political pressure. […] Monetary targeting can therefore be seen as an approach whereby a central bank can obtain additional independence from the politicians".

In the debate on "monetary targeting", the explicit and primary role assigned to money growth, as a valuable and primary policy indicator, endows the central bank with a simple and clear rationale to make a more comprehensive analysis of inflationary pressures in the medium and long term. As recently seen, both in Europe and in the US since the 1990s, there has been a long period of low inflation and at the same time of systematic higher money growth. Even though not fully reflected in consumer inflation indices, the continuous injection of excessive liquidity has led to an increase of the demand of residential, real and financial assets, as well as that of final goods and services, that have finally deteriorated the purchasing power of the currencies on both sides of the Atlantic. And, in the absence of an intermediate reference such as money growth, the central banks of both economies did not have institutional elements that exerted enough pressure to change their policies, despite the continuous increase of liquidity every year. On the other side, this strategy is very much dependent on the stable relation between money growth and the measure of inflation; which is especially difficult to maintain in times of economic crisis, of financial innovation, or of institutional or political changes, such as the creation of a single currency for quite different countries.

In sum, from 1975 to 1999, under a monetary rule, the *Bundesbank* achieved a successful record of low inflation, even avoiding the high inflation figures associated with the years of the "Great Inflation" of the 1970s. Rather than a fixed mechanism to conduct monetary policy, "monetary targeting" provided the policy framework to restrict the central bank's policy and to underline its commitment to achieve price stability according to a pre-announced strategy; in which the regular announcement and explanation of an intermediate money growth target was a key element. By doing so, in the face of unexpected events, the central bank did have certain, but limited, room to deviate from the announced intermediate target in order to achieve the final goal; being *de facto* a "flexible monetary targeting", or what some economists have called a "pragmatic monetarism" (Issing 1997).

[21] "Deviations of money growth from the targeted path always had to be justified. Even if it is true that the reputation of the Bundesbank ultimately was achieved by its success in fulfilling its mandate to safeguard the stability of its currency – its ultimate goal – current policy continuously had to be justified in the context of its pre-announced strategy. In this case, the strategy contributed to the transparency, the accountability, and the credibility of the Bundesbank's policy." Issing et al. (2005), p. 50-52.

2.2.2.2. The emergence of "inflation targeting" in the 1990s

The collapse of the Bretton Woods fixed exchange rates system after the so-called "oil crises" led to a floating system and higher rates of inflation in most developed economies. With some exceptions, in the 1980s the West European countries adopted the German Mark as a credible and effective anchor for achieving price stability under the Exchange Rate Mechanism. To do so, these countries pegged their currencies to the Deutschmark (DM), thus linking their monetary policies with that of the *Bundesbank*. Between 1992 and 1993, the speculative attacks on several European currencies evidenced the fragility of the European Monetary System, which resulted in the exit of several currencies (among others, the UK's), the weakening of the ERM to permit 15% bands, and the need to adopt new monetary policy strategies.

With the notable exception of Germany, after several monetarists attempts (see the US from 1979 to 1981), most developed economies opted for a more transparent policy framework, different from both pegging the exchange rate or adopting intermediate monetary targets. As explained in detail in Chapter 4, since 1992 UK monetary policy has evolved towards a more transparent, independent and, finally, a rule-based monetary strategy. Though previously adopted by other economies, such as New Zealand (1989) and Canada (1991), the Bank of England was at that time the largest central bank to adopt an explicit "inflation targeting" strategy. Other economies adopted this strategy, such as Sweden and Finland in 1993, and many others afterwards. In this section, we describe the general outline of this new monetary policy rule, leaving the description of the country specific institutional settings and other policy details to Chapter 4.

While there is no explicit definition of inflation targeting (see Svensson 1999, Bofinger 2001), it is characterized by the following:

(1) the central bank has a quantified target for inflation that is not easy to change;

(2) it has the operational independence to achieve that target;

(3) it is held accountable for its performance so it has a strong incentive to succeed.

Most inflation-targeting central banks argue that for such a policy to be credible it has to be exercised in a manner that would readily show up deviations, i.e. policy should be 'transparent'. Success also relies upon people understanding the arguments behind policy – hence it is felt necessary to publish models, forecasts and analyses and hold press conferences and answer questions in public.

A key element of this strategy is the regular announcement of the conditional inflation forecasts; which can be interpreted as a true leading indicator of policy changes in the medium term. In fact, if the central bank expects inflation to be above the numerical target, the rule prescribes a more restrictive policy in order to correct that deviation in advance. As a result, if the bank is credible, the public announcement of its forecasts normally reveals the most likely monetary policy path in the near future. Of course, inflation forecasts are conditional. They may assume unchanged interest rates, but these days it is more normal to set out a particular interest rate path implied by market expectations or a policy rule embedded in the central bank's main model, given the estimates of the expected fundamentals of the economy. Hence, this rule allows for deviations from the previously announced forecasts when circumstances change and unexpected factors affect the economy. In some cases it may be necessary to deviate from the inflation target temporarily to avoid imposing too harsh adjustment costs on the economy.

As with the "monetary targeting" strategy, this deviation from the strategy should be exceptional and would require a detailed explanation to the public. Accordingly, even though it is a rule-based strategy, "inflation targeting" also provides some, limited, flexibility.

While both types of rules stress the need for increasing transparency and the commitment to a low inflation final goal, the key difference between "inflation targeting" and "monetary targeting" mainly relies on the different mechanisms and procedures established to achieve the goal, and explain policy decisions. In the case of "monetary targeting", inflation forecasts are fundamentally calculated according to the expected money growth, and the intermediate money growth target is set by applying the *quantity equation*. In the case of "inflation targeting", there is no intermediate target, and the inflation forecasts are based, in principle, on an unrestricted and unlimited set of information including monetary aggregates. In fact, rather than being based on a particular model, "inflation targeting" is plainly compatible with adopting different types of models; or with the adoption of a comprehensive eclectic approach (Bofinger, 2001).

2.3. Central banks as lenders of last resort: the so-called ‘Greenspan put’

Once the Bretton Woods system of fixed exchange rates broke down each of the founding members was able to have an independent monetary policy or so it seemed. In principle, a flexible exchange rate allowed the central bank of each monetary zone to create money and fix its bank rate as it saw fit, with the consequence that each zone had its own inflation rate. Flexible exchange rates made an independent monetary policy possible.

This, however, slowly turned out to be an appearance. The free movement of capital that had made Bretton Woods unsustainable now limited the autonomy of monetary policies to mere appearance. ‘Hot money’ as it was called flowed at great speed from one monetary zone to the next equating real returns on Government bonds, given inflation expectations. In the long run, underneath the nominal interest rates of each zone were adjusted by the market so that real interest rates tended to converge; and the same could be said of nominal and real exchange rates. In fact it became clear that the level of those real rates was out of the hands of national monetary authorities.

The convergence of these rates was speeded up under the influence of the monetary policy of the Fed, given the importance of the dollar as international money. If the Fed practised a lenient monetary policy, the increase in world liquidity impinged on all monetary zones, and influenced inflation rates and asset prices everywhere, whatever the different monetary authorities may have wanted.

After the Volcker presidency of the Fed (1979-1987), when the great American inflation was beaten back by a very severe monetary policy, there came a period of thirty years when the main concern of monetary authorities round the world was to avoid recessions or get quickly out of them. The Friedman-Schwartz lesson had been learnt: by dint of a generous creation of money, nominal income and asset prices could be reset on a growth path despite temporary hiccups in the real cycle. Another way of saying this is that the function of lender of last resort of central banks, especially of the dollar central bank, was to guarantee that over the medium term nominal income and stock exchange indices would not be allowed to fall.

This implicit promise of central banks was associated with the policy of Chairman Greenspan: the Fed was assumed to guarantee an upward path for nominal income and a floor to asset prices, so that a virtual ‘Greenspan put’ was believed to be in effect.

3. THE EURO AND THE EUROPEAN SYSTEM OF CENTRAL BANKS (ESCB)

3.1. A new experiment

The lines along which the European Monetary Union (EMU) and the euro were created were deeply influenced by the monetary arrangements in Germany after WWII. The menace of another hyperinflation along the lines of what happened after WWI was conjured by the Währungsreform enacted by Ludwig Erhard in 1948. This monetary reform was a central part of the freeing of the German economy that helped bring about the post-war 'German miracle'. The new Deutschmark successfully replaced the discredited Reichsmark by freeing the new money from the exchange controls surrounding the old currency but at the same time entrusting its issue to an independent Bundesbank, whose remit was to control inflation. In this the Bundesbank was successful and over half a century the Deutschmark became a byword for monetary stability.

When the moment came to establish a common currency for the European Union, the influence of the Bundesbank was paramount. The drive towards a European currency mainly originated in post-Gaullist France when the French political establishment wanted to free the country from the monetary discipline imposed by the founder of the Vth Republic. There was also a wish to avoid foreign exchange instability within Europe and towards the US, since sudden changes in the exchange rate were felt to be harmful for local industry. The Bundesbank however was reluctant to create a common currency without guarantees that it would not be a cause of continuous inflation.

The first two attempts to set up a monetary union failed signally. One was the Werner plan of 1970: it miscarried because of German insistence that monetary union be accompanied by well-defined institutional safeguards. The other was the Exchange Rate Mechanism (ERM), established in 1979: the DM was the anchor currency and the effort to keep a weak currency within the defined band had to be financed by all members not only by the Bundesbank. First there was the resistance of the Banque de France to keep interest rates well above those of Germany, as it was felt that such high rates impaired growth. Then came the forced exit of sterling from the ERM: a general feeling that the British currency was overvalued came to a head when George Soros successfully shortened it and forced its exit from the ERM in September 1992.

The third attempt however did end in the creation of the European Monetary Union (EMU) and the launch of the euro. The blueprint came from the Bundesbank and was adopted by the German Government, which presented it to other Union members: a single currency and central bank preceded by a concerted reduction in inflation rates and budget deficits, by the liberalisation of capital flows, accompanied by progress towards a political union. The latter fell by the roadside but convergence towards low inflation and balanced budgets was written into the Maastricht Treaty, signed in February 1992. Of course the Treaty contained many other points apart from monetary union (MU), where an effort was made to strengthen the Union as a counterweight to a united Germany. The date set for the launch of the MU was 1 January 1999 but before that the Bundesbank and the German Government in 1997 obtained the signature of the Stability and Growth Pact (SGP) by all the European partners. This prolonged the need to abide by the essential conditions for monetary stability demanded for entry in the first place. Some of the Maastricht conditions were redundant after adoption of the euro, namely those of exchange rate and interest rate stability of the different currencies.

Those pertaining to budgetary discipline, however, were in danger of being relaxed once entry had been obtained, namely that national debt should not top 60% of GDP and that budget deficits should not be higher than 3% of GDP. The SGP set out a mechanism of review, warning and penalties that were felt to be excessive in later years, so that the Pact was diluted with in March 2005[22].

The 2007-2009 financial and economic crises have in effect suspended the application of the SGP, as the Treasuries of the Member States have flown to the rescue of their banks, their large industrial companies and their property markets, despite the steep fall in tax revenues. The European Commission has reduced its efforts to trying to avoid the protectionist fall-out of national rescue measures – with what success is still to be seen.

3.2. The evolution of ECB monetary policy: the two pillar strategy

3.2.1. Political and economic restrictions in the early years

The euro experiment is unprecedented in as far as it consists in the creation of a new currency by a method of social engineering. A number of conditions for the success of this project have been distilled from existing monetary theory and past experiments in monetary policy.

- The experiment must last for a number of years and be seen to subsist under conditions of boom and slump.
- The euro must be seen as a quality currency, in that it does not lose value over time, so that ordinary people as well as non-European central banks and national Treasuries are happy to use it as a store of value.
- The fact that the euro zone is not a single economic zone, that employment, investment, and fiscal conditions are deeply different in the various parts of its area, must not be seen to impinge on the monetary policy of the ECB, which must show confidence that a spontaneous convergence will slowly erode local differences.
- Markets must be convinced that the ECB is mainly concerned with the long run in its monetary policy and will not be tempted to curry favour by trying to use the euro to create jobs or foster growth by using short-term trade-offs.
- The ECB must be seen as independent of all political authorities, be they European or of the Member States, so that its goal to keep inflation under control becomes credible.
- The claim that the ECB is independent of European or local politics will not be believed if the budgets of the Union and the Member States are not balanced in the long run, for fear that public debt will be monetised, especially the implicit debt of unfunded social entitlements.

These constraints govern the creation of general confidence in the quality and permanence of the new currency. They may explain some of the differences in strategy between the ECB and other central banks.

[22] See Buiter (2006).

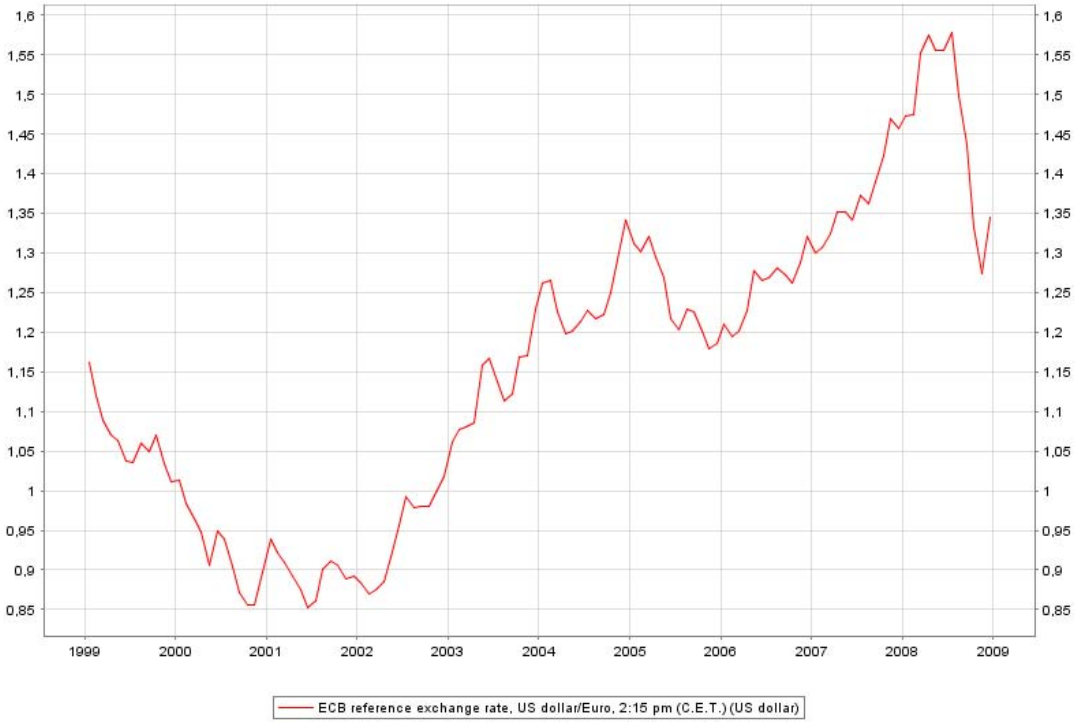
The ECB has shown itself less ready to move its official interest rates according to changing market conditions, more wary of full transparency for fear of nationalist backlash, more resistant to calls from the European Parliament to apply expansive policies in response to depressed local circumstances, more critical of budget deficits, than other central banks. The 2007-2009 financial and economic crises will put its relative orthodoxy to the test.

3.2.2. Statutory definition of a stable HICP as the primary target

3.2.2.1. Definition of the primary mandate

The tasks of the ESCB and the ECB were defined by its statutes in 1992, annexed to the Maastrich Treaty[23]. According to them, the primary objective of the ECB is to maintain price stability in the euro area: "In accordance with Article 160 (1) of this Treaty, the primary objective of the ESCB shall be to maintain price stability. Without prejudice of the objective of price stability, it shall support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community as laid down in article 2 of this Treaty". This is an institutional mandate that clearly sets out the priorities of the single monetary policy, in terms of maintaining the domestic purchasing power of the euro. Within the legal definition of its tasks, there is a well defined hierarchy among the goals of monetary policy, and thus a single mandate. The mandate excludes the adoption of an exchange rate target (actually, see in Figure 1 the variability of the exchange rate vs. US dollar since 1999), and the implementation of monetary policy measures incompatible with maintaining price stability. Thus, unlike the statutes of the central bank of the US Federal Reserve, the statutes of the ECB provide a well defined and single mandate, easy to interpret and undoubtedly committed to maintain internal price stability.

Figure 1: Euro exchange rate vs. US dollar



Source: From the ECB website (monthly data).

[23] See the Protocol of the Statutes of the European System of Central Banks and the European Central Bank (*Official Journal of European Communities* Nº. C 191/68).

The mandate of price stability thus defined is a strong legal restriction on monetary policy-makers. It effectively limits the range of discretion of the policy-makers by setting the primary goal of the institution. However, the operational definition of price stability is not given in the statutes, nor is it set by any executive power (the latter being the case for the Bank of England). Nor does the definition of the primary target lay down the time horizon over which it must be achieved. In the euro area, the operational definition of the target, which includes not only the announcement of the inflation rate compatible with price stability, but also the variable used to measure it as well as the time horizon, has been determined by the Governing Council of the ECB[24], the committee[25] that conducts the single monetary policy in the euro area. Accordingly, even though restricted by its own statutes, the governing bodies of the ECB maintain a (limited) degree of goal independence; in the sense that its mandate needs to be made operational by the policy-maker and this exercise is compatible with pursuing several goals in the short run (Bofinger, 2001). Several months before the launching of the single monetary policy in January 1999, the ECB Governing Council defined its policy target and it was announced by the then President of the ECB, W. Duisenberg, as follows:

> "In the interest of transparency and in order to give clear guidance with regard to expectations regarding future price developments, the Governing Council of the ECB has agreed to announce a quantitative definition of price stability. In consequence, the Governing Council of the ECB has adopted the following definition: "Price stability shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%. Let me emphasize the fact that price stability is an objective which is to be maintained over the medium term"".[26]

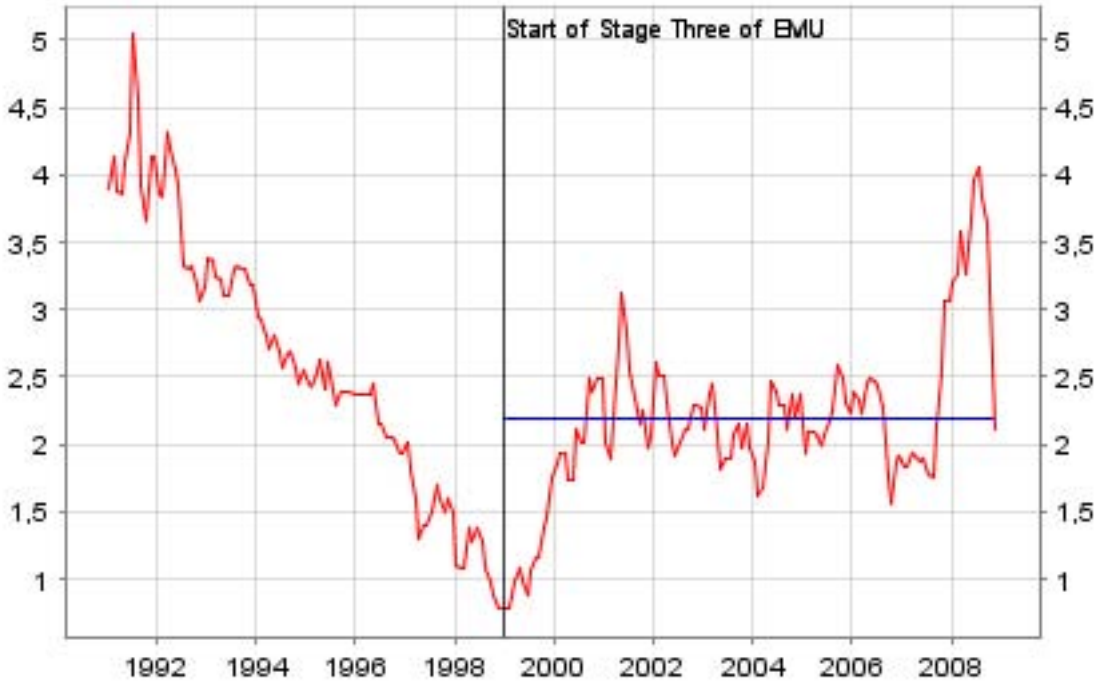
According to this definition of the target, highlighted by the President of the ECB during the above mentioned press conference:

> (1) inflation in the euro area is measured by calculating a single and harmonised consumer price index for all the area; which stressed the wish to conduct a single monetary policy according to the developments of the euro area as a whole;
>
> (2) the adoption of a medium-term time horizon also emphasised the need to conduct a forward-looking strategy, which avoids myopia in policy, fine tuning, and erratic, short run focussed, policies.

Consequently, if transitory, short-run HICP inflation deviations for the 2% target are plainly compatible with a price stability oriented policy in the medium term and they are ignored[27].

[24] It is interesting that ECOFIN chose not to offer a view on what constituted price stability at early stage before the Governing Council came into being.
[25] The ECB Governing Council comprises the members of the ECB Executive Board (6, the President, the Vice president and four more members) and the governors of the euro area NCBs (16). After consulting the European Parliament, the members of the Executive Board are appointed by the Heads of State or governments of the euro area Member States for a (non-renewable) 8 years term.
[26] ECB Press Conference, October 13th 1998.
[27] See ECB (1999) for more details on the specification of the objective of the ECB.

Figure 2: The ECB policy task in terms of HICP



Source: From the ECB website (Eurostat data). The blue line represents the average of euro area inflation since 1999, which has been above the ECB quantitative definition of price stability (below but close to 2%).

There are other important questions regarding the definition of the target that need to be addressed.

Firstly, the announcement of the quantitative definition of the primary objective was considered by the ECB as the best way to provide reliable and easy to interpret information to the market, so agents could form expectations and guide their decisions more efficiently. However, from the very beginning of the single policy, the ECB has stressed that the announcement of a target compatible with price stability should not be seen as implying an inflation targeting strategy; such as those of the Reserve Bank of New Zealand or the Bank of England. The mere adoption and announcement of a point or even an interval target is plainly compatible with conducting several strategies but is rather difficult to see how this differs from inflation targeting central banks with medium-term objectives. In fact, since the 1990s most central banks are committed to achieve a quantitative definition of price stability but they do not all follow a single strategy to achieve it. In this vein, there has been a growing consensus on the goals of monetary policy but the selection of the best operational strategy is still open to controversy and academic debate.

The objective thus defined was viewed as an extension of the policies pursued by the euro area national central banks (NCBs) prior to 1999; and particularly as part of the successful price stability policy developed by the *Bundesbank* since the late 1970s. In this sense, especially in the early years, the ECB opted to continue the main elements of the *Bundesbank*'s strategy in order to reduce the uncertainty inevitably associated with the conduct of a single policy for different (eleven) economies.

Secondly, the primary objective is defined and measured in terms of a specific inflation rate, and not of a price level target. While having the advantage of being more predictable and easier to interpret and monitor, in case of a positive deviation from the target, the adoption of a price level target would require a policy reaction to bring back prices to the targeted level; in a world with nominal rigidities in the short run this implies output and unemployment costs.

Finally, the ECB opted for the overall HICP, instead of a more restricted or core inflation index. On the one side, excluding unprocessed food and energy components from the index would result in a more consistent measure of the underlying inflation; which would be compatible with the notion of medium-term price stability adopted in the definition of the policy target. However, on the other side, aiming at core inflation implies that all non-core inflation components just fluctuate randomly, and thus disturbances revert to the mean; this assumption does not necessarily correspond with the empirical evidence.

Some policy-watchers and academics interpreted the absence of a floor in the ECB definition of the target as a source of indeterminacy and as an asymmetrical target (Svensson, 1999). (Although this was soon clarified when the ECB President pointed out that the target was *in*flation giving an implicit lower limit of zero.) In particular, following the initial announcement of the quantitative definition of the objective, the ECB was criticised for not defining either a clear point target or a range target; this was interpreted as an incomplete definition of the policy target. As part of an overall evaluation of its strategy, in 2003 the Governing Council confirmed the initial objective as well as clarified it in the following way (Press Conference on 8 March): “"Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%. Price stability is to be maintained over the medium term." Today, the Governing Council confirmed this definition (which it announced in 1998). At the same time, the Governing Council agreed that in the pursuit of price stability it will aim to maintain inflation rates close to 2% over the medium term. This clarification underlines the ECB's commitment to provide a sufficient safety margin to guard against the risks of deflation. It also addresses the issue of the possible presence of a measurement bias in the HICP and the implications of inflation differentials within the euro area.” With this clarification of the objective, the ECB made a clear statement against inflation and even more against deflation by committing to achieve a positive (but low) rate of inflation which, after taking into account the estimated measurement bias of current CPIs, virtually means price stability. In fact, the positive target given for inflation is a bit higher than the conventional estimations of the measurement bias (around 1%), thus creating an additional margin to avoid deflation.

3.2.2.2. A forward-looking strategy and objective

The adoption of a medium-term horizon responds to the fact that inflation is a medium and long term monetary phenomenon; thus, central banks are able to affect the general price level over the medium and long term but with some delay. As summarised in Schwartz and Castañeda (2008): “There is therefore general agreement that monetary policy must not attempt instantly to correct all deviations of the general price level from target. The need to focus on the long term, and not to try discretionary micro-management of the economy, is reinforced by the existence of two kinds of lags. One is the **transmission lag**, whereby the open-market operations of the central bank to change the short-term interest rates in the money market take time to have an effect on the liquidity of the monetary economy. The other is the **information lag**, the limited information, even about the situation of the economy at the time, at the disposal of monetary authorities when decisions have to be made.

These transmission and information lags make it inevitable that central banks focus on the medium and the long term and implement a forward-looking oriented and gradual monetary policy".

However, despite several general statements made by the President of the ECB[28], the announced medium-term time horizon has not been specified by the ECB. The selected horizon depends on the expected time needed to influence the targeted variables to achieve the final goal in response to a specific shock affecting the economy. In the event of a shock that drives inflation from target, the central bank should adopt the time horizon needed to allow for a gradual reverse of inflation to its pre-shock value without producing important costs and adjustments in terms of output losses. Since the selection of the horizon is affected by the above-mentioned transmission and information lags, its operational definition largely depends on the financial and economic conditions of the economy, as well as on the nature and the size of the shocks. However, the recognition of this fact does not justify any extension of the adjustment process; this could be interpreted as an implicit tactic to defer the adjustment process, thus resulting in a credibility problem for the central bank. Consequently, the central bank should also select the time horizon in line with the expected length of the shock affecting the policy goal. In the case of the euro area, the starting of a new currency area was considered a true structural change, and in the absence of reliable data on the euro area *as a whole*, the ECB was surrounded by a considerable degree of uncertainty (especially during its early years). For this reason, the governing bodies of the ECB opted not to tie their hands to a previously announced fixed horizon (see ECB 2003). According to the evidence for the euro area, and supported by available research (Angeloni et al., 2002, 2003) policy measures start to affect the targeted variables after 3 or 4 quarters. The peak effect takes place after 8-9 quarters and then decays gradually[29]. A true medium-term horizon should be consistent with those empirical results, which support the adoption of a more than two years time horizon for a smooth and gradual policy-making. However, we should treat this evidence with great caution. Since they are all the result of the available limited data and just approximations to the euro area monetary transmission mechanism models, we cannot assume the stability of the lags.

3.2.3. Policy-making: *Simultaneous* evaluation of the *two pillars*

3.2.3.1. Uncertainty as the determinant element in the early years

The statutes of the ECB firmly guaranteed the operational independence of the new supranational institution, thus leaving its governing bodies the power to design the monetary policy strategy deemed necessary to achieve the given mandate. The strategy adopted by the ECB during the last quarter of 1998, applied as from January 1999, clearly reflected: (1) institutional constraints, such as the different political and economic traditions in a new currency area shared by eleven economies; and (2) uncertain expectations among the public as to the strategies and modes of operation of a brand new central bank.

Especially during its early years, the ECB had to make policy decisions necessarily on the basis of limited knowledge on the functioning of the new monetary area and unavoidable lack of financial and economic data. The mere aggregation of the existing national models and indicators did not result in fully reliable representations of the new integrated currency area.

[28] In the Monetary Dialogue between the European Parliament and the President of the ECB (March 2008), when questioned by a MEP (Mr. Purvis) on this issue, Mr. Trichet answered that "In the constituency of central banks we generally consider the medium term to be between 18 and 24 months".
[29] In contrast to the effects on output, the effect of interest rates movements on prices is permanent.

The operation of a new currency, within a single monetary policy for all Member States, constituted a true structural change that could imply behavioural changes by market participants. As a result, past and national based macroeconomic models and indicators had to be interpreted with extreme caution. Consequently, the ECB did not have a reliable description or an approximation to the monetary transmission channels of the new area; and this factor was also determinant in the final adoption of its strategy. Also, the ECB lacked a policy record. In contrast to the US Fed, which had had a very good record of price stability since the end of the 1970s, a discretionary strategy was not a sensible option for the ECB, as it had to gain credibility by its own policy from the very beginning. To do so, it had to rely on its announced or "posted" strategy (Padoa-Schioppa, 2004) and on the successful record of price stability achieved by one of its main predecessors, the Bundesbank (Issing, et al. 2005). In order to reduce the high degree of uncertainty associated with the birth of the ECB and the new currency area, its governing bodies opted to gain credibility and reputation *ex ante* by adopting many of the main guidelines of the Bundesbank's successful strategy. In any case, Germany was the biggest economy of the new area and had a major impact on the available data.

As a result, the decision to follow the basic elements of the strategy of the Bundesbank has to be interpreted within that particular institutional and economic scenario, surrounded by more than usual limited knowledge, scarce information and thus a high degree of uncertainty; and not as a definitive option in favour of a particular type of strategy[30]. Moreover, from the very beginning, the ECB made clear that it was not following a single strategy, either the so called monetary targeting or alternatively inflation targeting, but a plural approach. By doing so, the ECB did not commit to follow a specific or restricted set of information *a priori* (money growth or inflation expectations, respectively) to guide its policy decisions. In its place, the ECB Governing Council (see ECB, 1999) designed a new "two pillars" strategy based on a multi-model approach and on more than any single set of decision-making indicators. The rejection of a single strategy to conduct the ECB's monetary policy also responded to the heterogeneity of the financial conditions, economic backgrounds and economic policies pursued by the Member States prior to 1999.

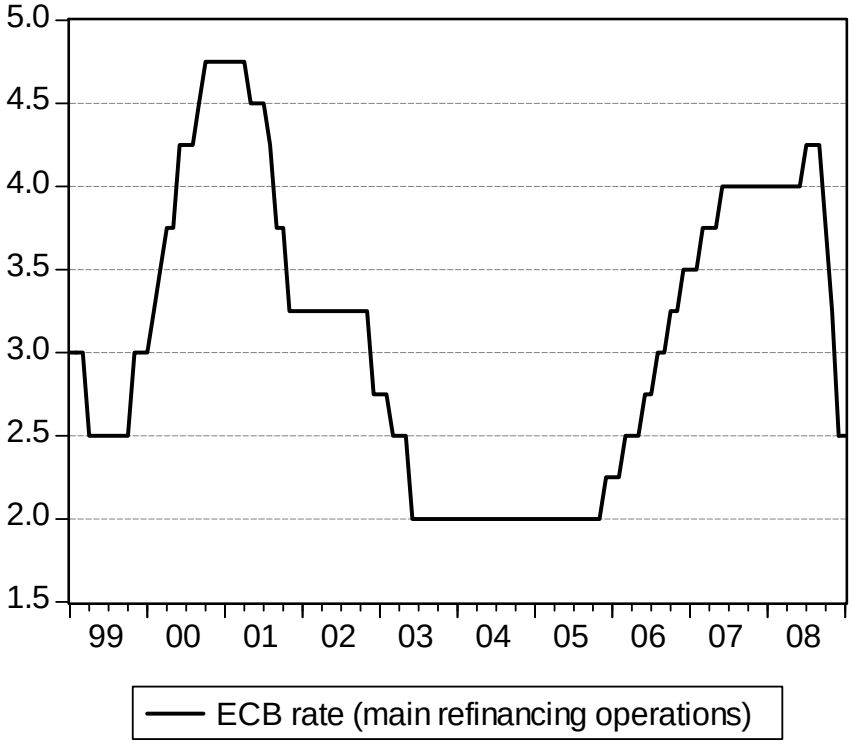
Another defining element of the ECB strategy since 1999 is the choice of conducting a relatively non-active monetary policy compared to most central banks of reference, thus having a conservative or non-reactive bias. Even though still an informal approximation to the degree of activism of the central banks, since 1999 the ECB has changed rates less frequently and in more modest steps (see Figure 3)[31]. However, this defining element of its strategy is not only the result of that initial environment, but also reflects the conduct of a true forward-looking policy committed to achieve a single objective; which excludes fine tuning polices, as well as reducing the need to frequently intervene in the money markets. In this regard, the recent experience of the ECB confirms that the selection of the policy strategy of a new institution should be a pragmatic decision made on the basis of the unavoidable restrictions that surround policy-making, and on the need to anchor inflation expectations on a long-term basis. However, it must also be admitted that two further factors favour relative inaction. The first is that with a very diverse set of economies there is more chance of variations offsetting each other and weaker common movement.

[30] In fact, there was a high degree of controversy and debates within the members of the Eurosystem in relation to the selection of the ECB monetary strategy; between the ones that supported the adoption of a money targeting and those in favour of adopting inflation targeting. Thus, the strategy finally adopted can also be interpreted as a consensus between those two policy strategy alternatives.

[31] See ECB (2006) for a revision of the techniques used to assess the degree of activism of central banks.

Second, the Governing Council has opted to act by consensus and consensus building takes longer than acting by simple majority.

Figure 3: ECB "official rate"



3.2.3.2. "Monetary analysis" as a medium term indicator of inflation

Money as the "first pillar"

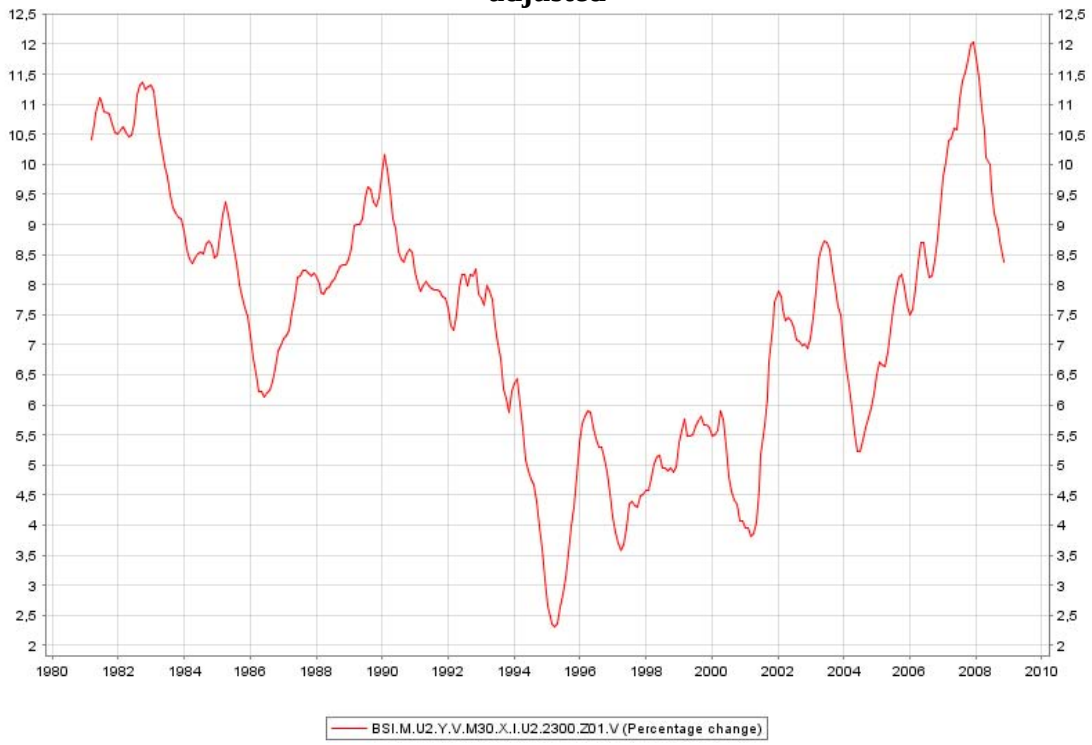
The elements of its strategy were first communicated in October 1998 within the announcement of the quantitative definition of the final objective, and explained in more detail in the ECB's January 1999 Bulletin (see ECB 1999, p. 39-50). According to the literal description of the ECB, "Inflation is ultimately a monetary phenomenon. The Governing Council therefore recognised that giving money a prominent role in the Eurosystem's strategy was important." (p. 47). Accordingly, money was first considered a primary indicator in the design of a price stability oriented policy in the medium and long term. Even more, "To signal the prominent role it has assigned to money, the Governing Council has announced a quantitative reference value for money growth as one pillar of the overall stability-oriented strategy." (p. 47). Following the details of the announcement of its strategy, the ECB announced (See Press Conference, 1 December 2008) the reference value for a broad money indicator as M3.

The calculation of that value was based on the *quantity theory* (M V = P Y) and on medium-term assumptions on output growth and money velocity (and the ECB continued to publish it once a year from 1999 to 2003): M being broad money growth, V money velocity, P prices and Y real income. After taking the logarithmic transformation, the quantity equation is equivalent to expressing all those variables in rates of growth (M3 stable prices = Trend GDP + HICP target – Trend V).

The desired growth of broad money supply (thus, the reference value) is calculated by setting the target for inflation (HICP) below 2%, and adding the expected growth of the economy (around 2%) and the expected decline of money velocity (0.5 - 1%)[32].

Even though having given a prominent role to money, and assigned and published a reference value to M3 growth, the ECB made clear that it was not adopting a monetary targeting strategy. Thus, persistent deviations of money growth from the reference value would signal risks to price stability in the medium and long term, but it would not necessarily result in a mechanical policy correction. The reference value was not an intermediate target, nor did the ECB commit to any type of monetary targeting rule. On the other hand, the first pillar was not merely the analysis of a single money indicator such as M3, but involved the evaluation of other monetary aggregates and, most important, their financial counterparts.

Figure 4: M3 moving average rate of growth, seasonally adjusted



Source: From the ECB website.

The announcement of a reference value for M3 served as a way to communicate the risks to price stability in the medium and long term by using a single indicator, as well as providing an institutional framework to explain the rationale and the hypothesis used by the ECB in the design of medium-term and forward-looking oriented policy. In this sense, the prominent role of the first pillar was reflected in the importance given to money growth in the introductory statement to the press conference of the President of the ECB, following each Governing Council's meeting. And moreover, the year on year publication of the reference value was also part of the communication policy of the ECB, and thus a channel to transmit the central bank's output and inflation expectations to the market, which contributed to increase the transparency and credibility of the ECB's initial strategy.

[32] Following the calculation of the ECB (1999), M3 *reference value* = (below) 2% + 2% - (below 1%) ≈ 4.5%.

Money growth as part of the ECB "monetary analysis": the revision of the strategy (May 2003)

The strategy of central banks involves not only the procedures used to extract and process information in order to assess monetary policy, and finally produce and implement policy decisions, but also the central banks communication with market participants and to which extent they are open and accountable to Parliament[33]. In this sense, the strategy mirrors the central bank's knowledge of the functioning of the economy, and reflects the set of information used to produce the policy outcome. The introduction of the euro area and the single monetary policy in 1999 reduced the (initial) degree of uncertainty, while providing both practical information and more accurate statistics to the policy-makers. The evaluation of the strategy of the central banks is always an ongoing process which is the result of a "learning by doing" dynamic. In the idiosyncratic case of the ECB, the need to evaluate its initial strategy, correct mistakes and extract policy lessons is even a more relevant exercise for a new institution such as the ECB. And that continuous evaluation is made not only externally by the ECB policy observers but internally by the staff of the Eurosystem.

Since the very beginning, the calculation of the reference value for M3 was exposed to a high degree of uncertainty and error; the mere aggregation of national data could lead to statistical distortions, and there was a significant (and unexpected) increase of non-residents' assets denominated in euros that altered the expected M3 growth (see Issing, 2008). In addition, since mid 2001, a much higher volatility in world financial markets had widely affected monetary variables in the euro area. Portfolios were adjusted to reallocate financial assets in favour of the more liquid. It resulted in a liquidity run that affected money measures such as M1, M2 and M3, which even (temporarily) eroded their role as medium and long-term indicators of price level changes. All these factors led to systematic deviations of M3 growth from the announced reference value[34], which were judged to have no relation to the role of money growth as a leading indicator of the long term purchasing power of the currency. Accordingly, since the ECB monetary policy did not react to correct those deviations, it led to increasing difficulties in explaining policy decisions, and thus to a deterioration of its communication policy and credibility.

In 2003, the increasing discrepancy of M3 relative to its reference value accelerated the announcement of the clarification of the ECB's strategy, which was finally adopted in May. After more than four years of conducting the single monetary policy, that public revision reflected the deepening of the strategy, as well as the clarification of controversial elements. Firstly, viewed as a way to avoid misunderstandings and to make its communication policy clearer and more effective, since 2003 the ECB abandoned the announcement of the reference value for M3 growth. This policy change moved the ECB strategy away from the one of its predecessor (the Bundesbank), which made even more evident the non-adoption of a monetary targeting strategy. Secondly, the ECB stressed that first pillar involved much more than focus on the mere deviations of M3 growth in relation to the reference value, but a true monetary analysis of all monetary aggregates and their counterparts.

[33] See the definition of this term in Angeloni et al. (2000, p. 4): "by strategy we mean the framework and the procedures that the central bank uses to translate relevant information into monetary policy decisions". Padoa-Schioppa's definition stresses the non-mechanical process of policy-making (2004, p. 77): "Its role is to identify relevant information, help interpret it, and connect it with possible actions, but not to mechanically produce a decision."

[34] As shown in Fisher et. al. (2008), even if considered the corrected measure of M3, which was calculated to eliminate the exogenous factors affecting broad money growth, the ECB still faced a significant deviation of the new corrected M3 growth from the reference value during 2002 and 2003.

Thirdly, the ECB changed the structure of the President's introductory analysis given in the press conference held after the Governing Council meetings; and it also referred to the two pillars in a broader, more comprehensive sense. Since 8 May 2003, it starts with the analysis of the economic indicators (economic analysis) and it is followed by the monetary analysis.

Either a mere clarification or a true change of the ECB strategy, those announcements were the result of the internal revision of its strategy, which at least had explicit effects in the ECB communication policy. Anyhow, the ECB emphasised its commitment to follow the strategy, by which inflation was explained according to two different sets of information and time perspectives: one that explains inflation as a medium and long term monetary phenomenon, that is the monetary analysis; and another that explains inflation in the short run as the result of "the interplay between demand and supply factors" (ECB, 2003, p. 87), that is the economic analysis. Especially since May 2003, the ECB made it clear that there is no hierarchy of pillars since the overall assessment of inflation is made by cross-checking both information sets. In the following section, we concentrate on this point with some detail.

3.2.3.3. "Economic analysis" or the "second pillar": inflation in the short term

Even though a monetary phenomenon, in the short term inflation responds to quite diverse economic factors, such as changes in goods and services and labour markets. As stated above, interest rates affect money growth and hence inflation with a time lag, and this correlation is also exposed to temporary distortions that could make it less reliable as an effective policy guide. In consequence, we need to consider a wide set of indicators to complete the evaluation of inflation in the short to medium term.

The adoption of this strategy permits the ECB to distinguish between two sets of indicators that affect inflation over two different time horizons: on the one hand, the ECB is able to identify variables that affect inflation in the very short run (energy prices, exchange rates, supply shocks…); and on the other, using monetary analysis, the ECB concentrates on the variables that determine inflation in the medium to long term. In practise, as part of the economic analysis, four times per year the Eurosystem staff (June and December) and the ECB staff (March and September) make and announce projections on inflation and the GDP; which are based on certain assumptions on the exchange rates and interest rates, and on euro area and multi-country macroeconomic models. In order to reflect the uncertainty associated with the projections, they are not presented as single values but as ranges; and, furthermore, that unavoidable high degree of uncertainty also explains why the ECB opted not to publish the projections within a "fan chart". Following Issing (2008)'s argument: "The ECB decided not to use the 'fan chart' in order to avoid giving the impression that it had specific knowledge of the profile and distribution of forecast uncertainty" (p. 116). The projections as well as the information used for their calculation are one of the basic inputs evaluated by the members of the ECB Governing Council to make monetary decisions.

Such an outcome is likely to be true of any central bank in a relatively large country where the decision-making is not dominated by an individual or close-knit group. Thus in Canada the policy board has clearly distinguished their own views from those of the 'staff forecast' and in Australia there has been no exclusive focus on a single model.

However, in contrast to the role of inflation forecasts inside some inflation targeting strategies, these projections are not made by the Governing Council, nor imply any policy commitment. They are only part of the information used to produce interest rate decisions: Firstly, since the projections are always based on non-definitive and diverse and controversial models, as well as uncertain information, the outcomes of the projections must be filtered and evaluated by the judgement of the members of the Governing Council.

In fact, they do no have to share the same model or even approach to interpret the available information; which results in the practical evaluation of more than a single model during the meetings. Furthermore, even the so-called optimal policy decisions embody a degree of model uncertainty, which recommends the use of several models and indicators as inputs to produce forecasts. Secondly, by its own construction, the projections are short term biased, since they do not necessarily take into account monetary factors that affect inflation in longer time horizons. For these reasons, the members of the Governing Council make monetary policy as the result of an overall analysis of inflation; which is made by the process of "cross-checking" of all the available information. By the cross-checking, the policy-maker is able to incorporate the monetary factors that explain the expected trend of inflation in order to focus on a true medium term oriented policy; which results in a forward-looking strategy.

Within the second pillar, the set of real indicators evaluated by the ECB is not restricted *a priori*, and thus comprises all the information needed to assess expected inflation in the euro area in the short term. In this regard, the analysis of the output gap is an element of the economic analysis, but it is neither another target nor the policy variable used by the ECB to guide monetary policy decisions, even in the very short term. However, in recent years, under the so-called *New Keynesian Models*, this variable has received more attention in the academia as one of the inputs of the new (forward-looking) IS and Phillips curves (Clarida, Galí and Gertler, 1999). Following them, inflation is explained by a long-term component, inflation expectations, and a short-term one, the marginal cost of labour. Many modellers have chosen to try to represent marginal cost by the output gap. Thus, once expectations are set, inflation in the short run is driven by output gap changes. However, the role of the output gap is small in comparison and has been difficult to determine. According to this type of models, the (optimal) interest rate is entirely explained by real factors. In effect, those models prescribe changes in interest rates in order to minimise a loss function with respect to both inflation and the output gap, which is taken as a condition to maintain nominal interest rates in the path of the natural interest rate of the economy.

As stressed by policy-makers (see King, 2005 for the Bank of England, and Issing, 2008 for the ECB), even though these models are useful for filtering and interpreting the available information, the practice of policy-making does not correspond to the so-called optimal approach associated with those models. Policy-makers do not adhere to a single model or a specific variable to make monetary policy. Furthermore, even if those models were adopted, the natural interest rate or the output gap are non-observable variables, difficult to estimate and subject to uncertainty; which makes them difficult to operate in practice. Any miscalculation of either variable could lead to significant policy mistakes. For this reason it is normally argued that policy-makers should concentrate on getting the direction of policy change right and not attempt to assess the size of any such gaps or deviations from natural rates (see Walsh, 2003, for example).[35] As stated above, both assumptions do not correspond to the main elements of the ECB strategy. In consequence, the reaction functions coming from those models are not reliable representations of the practise of the ECB.

[35] Walsh C, "Speed limit policies: the output gap and optimal monetary policies", *American Economic Review*, vol 93(1), 2003, pp. 265-78.

3.2.4. Accountability and transparency

3.2.4.1. Openess, credibility and legitimacy of a new institution

According to Article 7 of its Statute, "In accordance with Article 108 of this Treaty, when exercising the powers and carrying out the tasks and duties conferred upon them by this Treaty and this Statute, neither the ECB, nor a national central bank, nor any member of their decision-making bodies shall seek or take instructions from Community institutions or bodies, from any government of a Member State or from any other body. The Community institutions and bodies and the governments of the Member States undertake to respect this principle and not to seek to influence the members of the decision-making bodies of the ECB or of the national central banks in the performance of their tasks". In practice, this means full independence from both national and supranational political bodies regarding the conduct of its functions. This operational independence is reinforced by having its own budget, separated from that of the other European institutions, and fully financed by the operations of the ECB. As a result, the ECB is a separate policy agency that has legal independence and financial autonomy, which makes it truly operational independent.

The ECB's ultimate legitimacy derives from the EU Treaty and thus from the national parliaments of the Member States, and thus it should be seen as accountable to democratic institutions and to the general public. Again, the case of the ECB is exceptional; it is an independent institution in charge of monetary policy for a monetary area constituted of several sovereign countries. De facto, with the EU Treaty, the Heads of State and Governments created a new independent institution to conduct a single monetary area without a political union; for this reason, from its origin the ECB faced a problem of political legitimacy (see Buiter, 1999). As remarked in Chapter 1, transparency is not only a desirable democratic requisite but a crucial element for conducting an effective monetary policy. In principle, the commitment by the central bank to achieve its policy task is more credible the more information is given to economic actors about the policy-making-process. If credible, the central bank's policy is more predictable, and it all results in a firm anchoring of the market expectations in line of the tasks of the central bank; which in the end strengthens the effectiveness of monetary policy. The benefits of transparency for policy making are very significant and especially visible in the event of a shock affecting the policy task: if considered temporary, a credible and transparent central bank has some flexibility whether to react or not to the shock without affecting the market long-term expectations.

Accountability requires the regular explanation of the achievement of the tasks of the institution as well as of the ways used to achieve them (Buiter, 1999). So, accountability involves the evaluation of both the policy outcomes and the policy strategy followed to achieve the outcome. This broad definition of accountability allows the policy-watchers and the general public to know *ex ante* whether the central bank is adopting a strategy compatible with its announced target (see "ex ante accountability", Bofinger, 2001, or "transparent procedures", Buiter, 1999). A weaker definition of accountability is that made on the basis on the policy outcome or the policy record achieved *ex post* by the central bank, and not on the process adopted in each case (see "ex post accountability", Bofinger 2001, or "transparent outcomes", Buiter, 1999). Following the definition of De Haan et al. (2005, p. 109), the central bank is accountable when (1) it provides "the explicit definition and a ranking of objectives", (2) it discloses "actual monetary policy" and (3) it assigns "final responsibility with respect to monetary policy". We have already analysed above the targets of the ECB and, since the governing bodies of the ECB are fully independent in the conduct of monetary policy, the division of responsibilities is clearly stated in the Statutes.

Then, we will concentrate on the degree of openness of the ECB concerning the design and conduct of monetary policy. In particular, we address below whether the ECB (1) sets the basis of its expected policy path *ex ante*, and (2) explains *ex post* whether it followed the announced path or why it did not.

3.2.4.2. Elements of transparency

As required by its Statutes, the ECB must publish a weekly financial statement, quarterly reports on its activities and an annual report on the last and the current year's activities. This has to be presented to the European Parliament, the European Commision, the EU Council and the European Council. In order to fulfil those legal requirements, the ECB publishes the annual report and the weekly financial statements and, in addition, the ECB provides regular information to the market through the following complementary channels:

The ECB announces and explains monetary decisions just after the end of each meeting of the Governing Council. To do so, the President of the ECB makes an introductory statement to the press conference with a summary of the economic and monetary analyses. Afterwards, the President is also able to explain the details of the decision made by responding to the questions in the press conference; which is fully available live on the ECB website. However, unlike some other central banks, the ECB does not publish the minutes of the meeting nor the voting record of individual members. This is a quite controversial issue, since a transparent policy could arguably involve the publication of both. The institutional uniqueness of the ECB is again behind this decision. Every Member State has a vote in the Governing Council through the president of its NCB. However, countries may have different economic cycles or be suffering from specific shocks, and thus have different national "interests". Since the Governing Council makes a single interest rate policy for the whole of the area, the members will all disregard such national concerns in making their decisions. Hence, the lack of transparency in not publishing the minutes and the voting record enables them to avoid national political pressures; and hence helps to preserve the independence of the Council members and their commitment to making monetary policy decisions on a supranational basis.

The ECB publishes a Monthly Bulletin which includes analysis of the recent economic and monetary conditions in the euro area, as well as specialised research papers on specific questions related to monetary policy. With this regular publication, the ECB is able to explain the determinants of monetary policy and to provide technical information that promotes a better understanding of the models and factors taken into account in policy-making.

The President of the ECB also attends quarterly hearings at the European Parliament[36] (*Committee on Economic and Monetary Affairs*, ECON), which constitutes the so-called "monetary dialogue with the ECB". Every session starts with an introductory statement by the President of the ECB; this concentrates on explaining the policy decisions recently made by the central bank, and on expressing the views of the ECB on two pre-selected questions related to its tasks, which are supplied by the European Parliament. After that, the President answers the questions of the members of the Committee, who do not have the possibility of asking a supplementary question. With the hearings the members of the EP have a potential tool for asking the ECB why it did or did not achieve its policy target. However, this procedure is not as strong as the one of the Bank of England, since the ECB does not have the obligation to report to the Parliament if it misses the target (by more than 1 percentage point). The full transcript of the hearings is available at the ECB and the EP websites.

[36] See Art. 113(3) Treaty establishing the European Community (consolidated version).

Even though not a fixed arrangement for all meetings, the hearings are preceded by a preparatory meeting between the members of the Committee and a panel of experts, who submit brief reports on the selected questions that will be addressed with the President of the ECB; which are also available at the European Parliament website. In principle, with these reports and the preparatory meeting, the information (and knowledge) gap between the ECON members and the President of the ECB is reduced, which may contribute to a more effective evaluation of the decisions made by the central bank.

Finally, in relation to monetary policy strategy, the ECB rejected the adoption of a single policy rule such as inflation targeting or monetary targeting. As mentioned in previous sections, the governing bodies of the ECB chose a two pillar strategy based on a multi approach focus. The absence of a single hierarchy of procedures makes the ECB less accountable *ex ante*, since the central bank is not committed to achieve an intermediate target or to follow a particular forecast; so it does not provide the basic information needed to evaluate whether it is going to achieve the policy target or not. As a result, it does not fully explain which is going to be its expected policy in the near future. Even though not an intermediate target, the abandonment of the publication of the reference value for M3 in 2003 reduced that information, and thus also eroded its degree of ex ante accountability.

However, even though the ECB has not communicated all the information needed to evaluate its effectiveness *a priori*, it regularly provides key information to the market participants and the general public through other mechanisms. Firstly, twice a year the ESCB and the ECB staff publish the inflation and output expectations for the euro area in a two years time horizon ("Eurosystem staff projections" and "ECB staff projections") in the Monthly Bulletin. This results in quarterly forecasts with the summary of the projections on key variables for policy-making, which is part of the set of information evaluated by the members of the Governing Council. However, the publication is heavily truncated as it is by far the smallest report of any central bank that does publish it forecasts. Secondly, the ECB staff publishes extensive research on monetary policy issues; which includes the description of forecasting and modelling techniques that permits a better understanding on the functioning of the euro area economy and on the rationale used by the ECB staff to make its forecasts. Undoubtedly, this is not the single model of the economy, nor the model officially selected for policy-making, but only one of the different models used by the ECB staff to filter the available information and to make policy projections; which is one of the inputs of the second pillar and thus of the monetary policy outcome.

3.2.5. Some remarks on supervision and regulation in EMU

Regulation, supervision and inspection of the euro area financial institutions are competencies delegated to the national level; which are conducted by the NCBs or a separate body. On the supranational ("federal") level, the ECB, in addition to the conduct of the single monetary policy, has to preserve the well-functioning of the European payment system and, if needed, provide extraordinary liquidity to financial institutions. Apart from the advisory functions set out in its Statutes, the ECB also promotes the cooperation[37] of the national regulatory legislation by adopting common regulations and informal agreements better to react to a euro area crisis. This cooperation is currently conducted at the ESCB Banking Supervision Committee, the Economic and Financial Committee, the Financial Services Committee and the Committee of European Banking Supervisors.

[37] See a more detailed explanation in Schwartz and Castañeda (2007).

As a result of this cooperation, the different actors involved in supervision and regulatory functions have recently signed the so-called *Memorandum of Understanding*, to ensure the transmission of timely information throughout EMU and effectively react to a crisis.

Seeing the gravity of the recent financial crisis, this division of responsibilities in the euro area is currently under revision. First, the ECB though in charge of monetary policy and a Lender of Last Resort, has turned out not to have direct information on the balance sheets of the financial institutions of the Member States; though it has to rest content with information about the amount of liquidity and price of the bid of each single institution and hence market liquidity shortages (see Gonzalez-Páramo, 2009). Secondly, regulatory bodies (either the NCBs or separated agencies), which directly know the financial situation of member financial institutions cannot assist if needed. Simple coordinarion may not be enough to prevent early notice of a crisis and thus delay the required assistance. This is a very relevant, and disputed, policy question which has been subject to analysis with the creation of a High Level Group in November 2008. This Group, chaired by Jacques de Larosière, has already formulated policy recommendations on the division of competencies between the national and supranational levels[38].

[38] See the so-called de Larosière report.

4. THE STRATEGIES OF OTHER CENTRAL BANKS OF REFERENCE

4.1. The Inflation Targeting Experience of New Zealand

4.1.1. A brief history of the institutional arrangements for monetary policy in New Zealand

Up until the election of the Labour Government in 1984 New Zealand had followed the policy of having a fixed but adjustable peg for the exchange rate. However, within a few days of taking office the new government opted for a freely floating arrangement, which has continued ever since. Initially, after the float, monetary policy was based on targeting narrow money but this not only did not succeed in holding inflation down but it resulted in considerable volatility in short-run markets. While policy evolved in the ensuing years it became clear that a different anchor was required.

Two other main factors led to the adoption of inflation targeting. The Minister of Finance had made it clear that in his view the objective of monetary policy should be no inflation. At the same time the new government had also followed a policy of insisting that each public sector agency and government department should sign a contract with the relevant minister that laid out the objectives of the agency and how these were to be assessed. The turn of the Reserve Bank (RBNZ) came in 1988 although discussions had taken place earlier. The new ideas were incorporated in the Reserve Bank Act that came into force in 1989. The key provision of the Act is that 'the primary function of the Bank is to formulate and implement monetary policy directed to the economic objective of achieving and maintaining stability in the general level of prices'. This is then to be made operational by a specific Policy Targets Agreement (PTA): 'The Minister shall, before appointing, or reappointing, any person as Governor, fix, in agreement with that person, policy targets for the carrying out by the Bank of its primary function during that person's term of office, or next term of office, as Governor'. (RBNZ Act).

The Governor is personally responsible for ensuring that this agreement is adhered to and can be dismissed for failure to do so. Indeed it is a key feature of the arrangement that performance should be measurable and that there be a clear means of holding the Governor to account for his stewardship. The target is spelt out in the PTA, the first of which was signed in March 1990 – 'the Reserve Bank should formulate and implement monetary policy with the intention of achieving price stability by the year ending December 1992. An annual inflation rate in the range of 0 to 2 per cent will be taken to represent the achievement of price stability'. The accountability is however in the Act itself: 'The Bank shall deliver and publish a policy statement on or before the 1st day of October 1990 and thereafter at intervals not exceeding 6 months from the date of publication of each preceding statement. The policy statement shall be signed by the Governor and shall [s]pecify the policies and means by which the Bank intends to achieve the policy, [s]tate the reasons for adopting those policies and means: [c]ontain a statement of how the Bank proposes monetary policy might be formulated and implemented during the next 5 years: [c]ontain a review and assessment of the implementation by the Bank of monetary policy during the period to which the preceding policy statement relates.' These statements are automatically referred to parliament.

The main points worthy of note in this formulation are:

First that inflation targeting arose in this context of setting out objectives, not from an academic study of optimal monetary policy. Indeed it was not really until about 6 years later that inflation targeting achieved much serious academic focus, by which time it had been shown to work and had spread to some 8 countries (Haldane, 1995). At that stage the central banks involved had developed a clear exposition of the transmission mechanism.

Second, from its outset, inflation targeting was forward-looking. As the initial PTA shows, the RBNZ had the task of lowering inflation to achieve price stability over a period of just less than three years. (In practice they achieved it a year early.)

Third, price stability was defined as inflation in the CPI between 0 and 2% a year. This range was picked because the inflation bias from mismeasurement in the CPI was thought to be a little less than 1% a year and it was felt sensible to have a very simple definition. A 2 percentage point band was thought to be the narrowest that had a credible chance of success.

Fourth, it was felt necessary to introduce a range of caveats over events that might lead to short-run deviations from the target, for which the central bank could not be held responsible: major supply-side shocks, government policy changes, particularly in taxation and administered prices.

Fifth, there were concerns about the measurement of the CPI, as it contained an element of house prices and the RBNZ was instructed to produce a comparable internationally verifiable index without such a weight.

Sixth, the government had the right to override the agreement for a period of 12 months and substitute a different economic objective – a step that has never been taken.

Lastly the requirement to produce regular reports that look forwards as well as back, which were interpreted as entailing the publication of forecasts, has transformed central banks from secretive institutions into ones that are now more open than much of the rest of the public sector.

4.1.2. The development of the PTA

There have been nine PTAs in nearly 20 years and only the seventh survived the full five years as neither the Governor nor the Minister of Finance changed. A new government was elected in November 2008 and so a ninth PTA was signed. Despite changes in governments the basic characteristics of the PTA have been unaltered. When the new National Party government took office in December 1990 the new PTA contained very much the same provisions but rather more straight-forwardly expressed. The most important distinction was that the RBNZ was to achieve ‘a stable general level of prices by the year ending December 1993 and [maintain] price stability beyond that date’. Attaining a stable price level and inflation targeting were equated. Even though there is no provision for ‘error correction’ in the specification of inflation targeting it was assumed that over the longer term prices would indeed remain stable (after measurement error).

There have however been some important steps in the evolution of the framework as time has gone past. In the early days there were no accurate estimates of how the transmission of monetary policy worked as the New Zealand economy had undergone a massive structural change in the decade following 1984, with widespread freeing up of markets (Bollard and Buckle, 1987).

The only reliable forecasts could be drawn about the impact of the exchange rate on inflation and even there the pass-through varied over the economic cycle. In that period therefore the exchange rate played the major role in policy making and consequently the policy horizon was around a year ahead as much of the exchange rate impact on inflation came through rapidly.

The first step introduced by the Bank itself (Mayes and Riches, 1996) was to lengthen the horizon for policy and include other channels of the transmission mechanism more explicitly in policymaking.

The second, in response to breaching the target range for the first time in 1995, was to focus future policy on returning to the middle of the range rather than simply remaining within it. Many subsequent inflation targeters have set up their framework with a point target around which inflation is permitted to vary, usually by a maximum of 1%. Nowadays, irrespective of whether the target is a point or a range, central banks aim for the middle of the range to give them greatest chance of having a successful policy.

The third change, however, was external. In November 1996 the first election was held under proportional representation. Prior to that either Labour or National had been in power under the first past the post system and both parties had been firmly wedded to the Reserve Bank Act. In the 1996 election National, although the largest party did not win enough seats to govern on its own (no party has as yet won an election outright). In 1996 after eight weeks of bargaining they went into coalition with New Zealand First, a small party that was itself an interesting coalition of Maori and senior citizen interests. New Zealand First argued that the correct objective for monetary policy was not price stability but the inflation rates of New Zealand's trading partners, so that competitiveness was maintained. The resulting compromise was an expansion of the target to 0 to 3% inflation. This broke the link with the objective of a stable price level. Thus the shift to a low inflation objective had nothing to do with any of the arguments about stabilising prices running too great a risk of deflation or being unduly costly because of nominal rigidities in the economy. Indeed such evidence as had been compiled by the Reserve Bank suggested that there was sufficient flexibility in the labour market that the existing target was not costly and that price setters too were prepared to adjust downwards as well as upwards in response to shocks, albeit not completely symmetrically.

At the very same time the RBNZ started using its new model in producing the forecasts behind the December 1996 Monetary Policy Statement (Black et al, 1997). This set out all of the main transmission channels in what is these days the accepted framework, with a strong role for forward-looking expectations and with a policy reaction function built into the model so that a policy path and not just the current setting of policy was built into the forecast. Endogenous policy rules had first started being applied two years earlier when in late 1994 the RBNZ realised that it would be forecasting a failure to keep inflation within the target range if it made a projection on the basis of constant policy.

New Zealand has had more problems than some countries with the official definition of the CPI and its appropriateness as a target. After the initial problems with seeking a verifiable index excluding an excessive weight on house prices were resolved by a change in definition of the CPI, the PTA moved in 1997 to making the target CPIX, where the excluded portion was credit services. Since interest rates in effect entered the CPI, tightening policy would lead to an immediate increase in headline inflation. This and other experiments with using measures of underlying inflation to give a clearer explanation of the basis for policy have largely been abandoned as these measures do not resonate with the media nor the general public.

In the same way the attempt to include specific caveats under which temporary departures from the target would be allowed have increasingly been replaced with a more general phraseology. In the latest (2007) PTA this reads: 'For a variety of reasons, the actual annual rate of CPI inflation will vary around the medium-term trend of inflation, which is the focus of the policy target. Amongst these reasons, there is a range of events whose impact would normally be temporary. Such events include, for example, shifts in the aggregate price level as a result of exceptional movements in the prices of commodities traded in world markets, changes in indirect taxes, significant government policy changes that directly affect prices, or a natural disaster affecting a major part of the economy. When disturbances of the kind arise, the Bank will respond consistent with meeting its medium-term target.'

There has thus been a considerable move away from a simple verifiable target. In many respects this reflects the increasing credibility of policy. When inflation targeting first started it took some time for inflation expectations for to fall in line with the target but these have not been shaken much by recent quite high inflation on the back of oil price rises. Initially any departure from the target was treated very seriously and in late 1994 when the RBNZ first *forecast* that inflation might go a few decimal points above 2% the Minister of Finance immediately called for a report on the governor's performance. When inflation exceeded 3% in 2006 and again in the current year there has been no outcry as the excess was expected to be temporary.

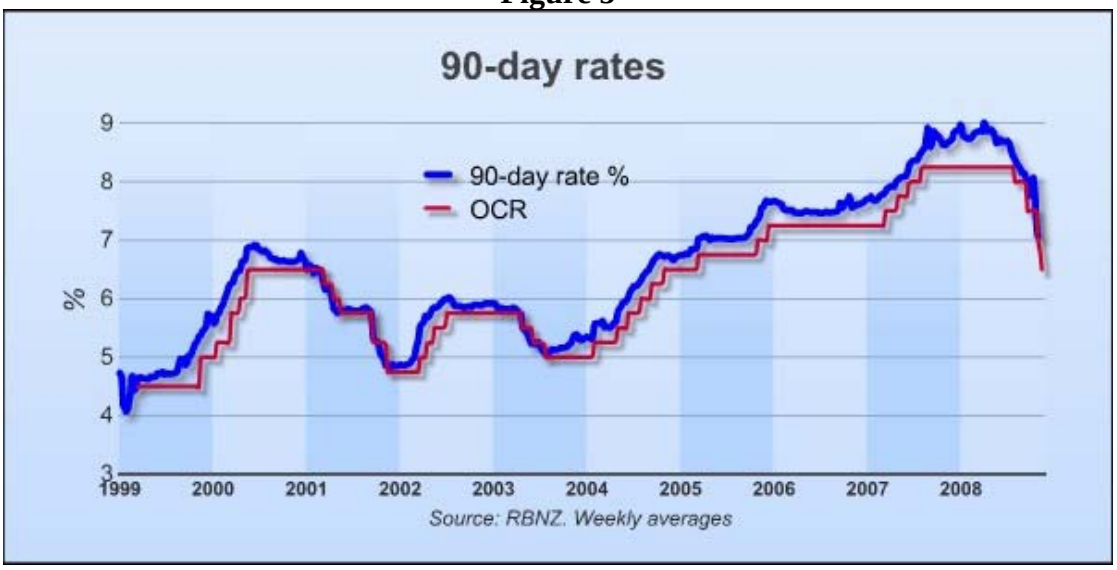
Changes have continued with successive PTAs. In 1999 there was an explicit emphasis that inflation targeting was to be 'flexible': 'seek to avoid unnecessary instability in output, interest rates and the exchange rate'. The particular reasoning advanced by the Minister of Finance, Michael Cullen: 'The renegotiation sought by the Government reflected a concern not to repeat the experience of the mid-1990s, when the export sector was placed under immense pressure by a sharp increase in the value of the dollar.' is the subject of the next subsection.

In 2002 the target was eased again, first by making it 1-3% instead of 0-3% and by making it explicitly a medium term concern. This was made clearer in 2007: the 'policy target shall be to keep future CPI inflation outcomes between 1 per cent and 3 per cent on average over the medium term'. No definition of the medium term is offered.

Before moving to the final issue of the exchange rate it is worth noting one other idiosyncratic feature of New Zealand monetary policy that reflected their philosophy of inflation targeting. Up until March 1999 the RBNZ did not set a short run interest rate. It stabilized the overnight market by fixing a cash ratio target and smoothing operations round this. In many respects this was a hangover from the previous regime of targeting narrow money aggregates. Its main policy instrument was what has been labeled 'open mouth operations'. In its Monetary Policy Statements and policy decisions it would announce an interest rate for 3-month Treasury Bills that it considered consistent with maintaining price stability. This was of course dependent on the exchange rate also forecast over the period.

Over time it became clear how much variation the RBNZ was prepared to accept round that interest rate for it still to be consistent with price stability. If the rate moved too far it would warn markets, threatening them with a change in the cash ratio if after a first warning market rates did not move. In practice these open mouth operations proved very effective and the RBNZ was able to go through much of the cycle without any need to adjust the cash ratio.

Figure 5



Source: ***New Zealand Interest Rates, Current Account Balance and Exchange Rate***
Source: www.rbnz.govt.nz.

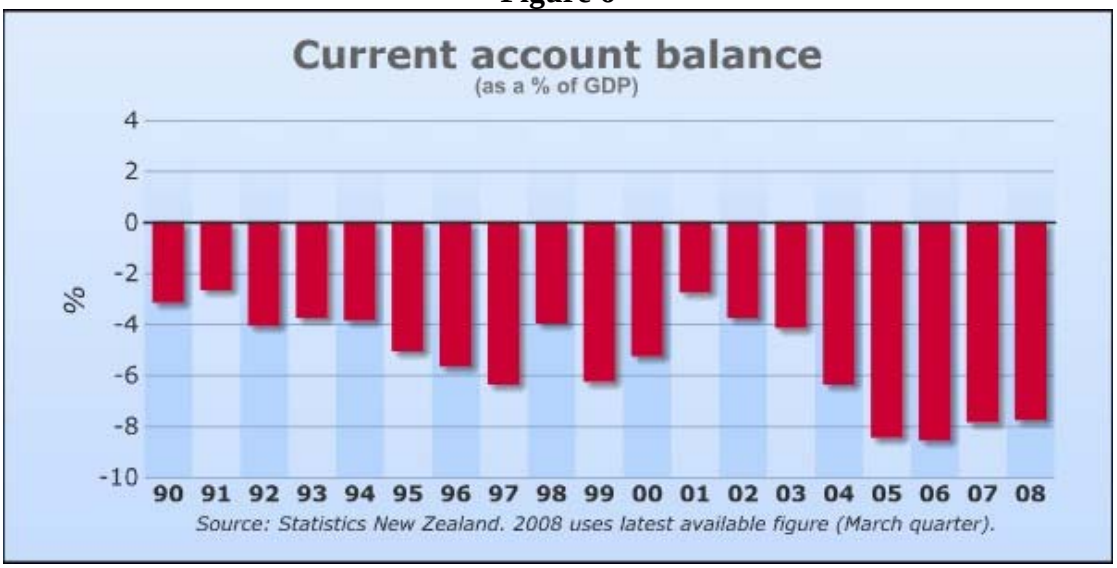
However, it did prove very difficult to communicate the contingency of the interest rate setting on the exchange rate. For a period from 1995 the RBNZ experimented with a Monetary Conditions Index (MCI), where the weights reflected the approximate relative effects on inflation through the transmission mechanism. They explained to markets that in the absence of external shocks it was up to the market to choose what combination of the exchange rate and the 3-month interest rate it wanted within a fairly broad range that the RBNZ deemed consistent with future price stability at the time. Or put differently, that the RBNZ did not need to respond to what were pure portfolio shocks. In practice the market treated the MCI as a target and this increased volatility. The idea was therefore abandoned and with some reluctance the RBNZ moved to the traditional setting of an overnight cash rate OCR, thereby suppressing some of the market information it wanted to see.

4.1.3. Controversy over the exchange rate

The RBNZ has found it very difficult to bring down inflation in the period since inflation targeting started. As a result real interest rates have had to be high, with the consequence of driving up the real exchange rate at the same time. In part this is the result of New Zealand being a small very open market in a different hemisphere from the world's main markets. As a result it is open to different shocks and its economic cycle can be out of phase with that in Europe or North America. The resultant pressures (see figures 5, 6 and 7) have been very difficult politically. On the first occasion in 1996-7 after a 25% increase in the real exchange rate over 3 years the government merely lent very heavily on the central bank, mainly in private, but with the real exchange rate rising again in 2004 the RBNZ requested and received an increase in the foreign exchange reserves so that it could intervene in the markets. The argument ran: 'The amplitude of the New Zealand exchange rate cycle has long been a concern. The exchange rate varies across the cycle to a far greater extent than the underlying economic situation warrants. That is, the degree of exchange rate variation goes beyond that which is useful to the economy in terms of absorbing economic shocks and motivating business and household to adjust to lasting changes in New Zealand's external trading situation. Excess exchange rate variation makes engaging in business more difficult, reducing investment and thereby restricting the opportunities for New Zealand's growth.

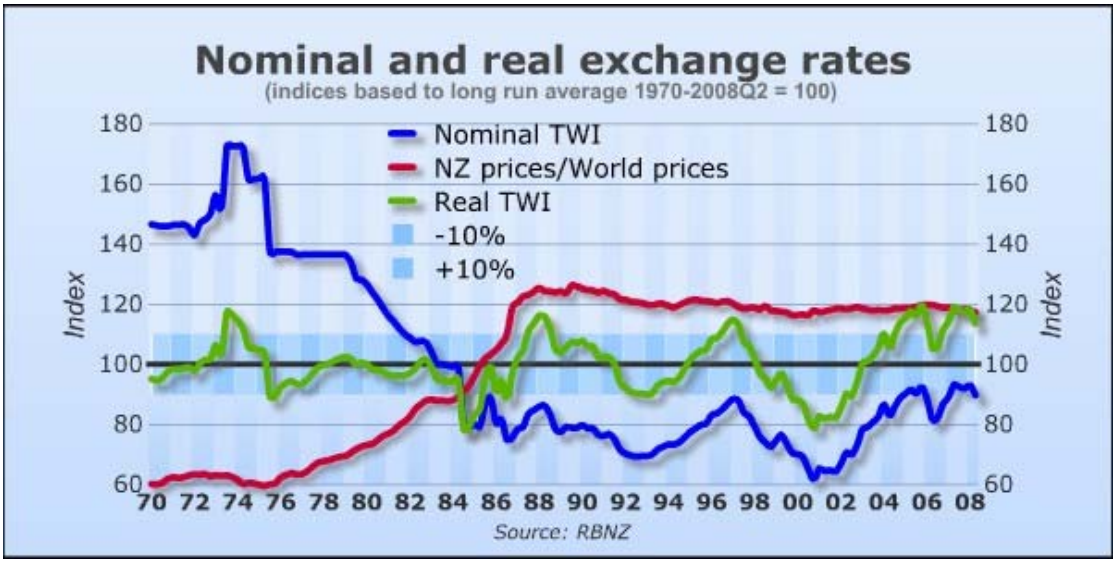
Excessive exchange rate variability can also make the Bank's task of achieving and maintaining price stability more difficult, potentially leading to unnecessary output, inflation and interest rate variability.'

Figure 6



Source: ***New Zealand Interest Rates, Current Account Balance and Exchange Rate***
Source: www.rbnz.govt.nz.

Figure 7



Source: ***New Zealand Interest Rates, Current Account Balance and Exchange Rate***
Source: www.rbnz.govt.nz.

This move started with research and was followed by a conference in 2002 on 'Exchange rate strategies for developed open economies in the new millennium' and a second in 2006 published as *Testing stabilisation policy limits in a small open economy: proceedings from a macroeconomic policy forum.* However, this was only part of the analysis as the investigations also considered reasons why such high interest rates were needed. In the event the exchange rate increase did not stop and by 2006 it was 40%.

This triggered an intervention but this had no longer term impact. It was only when the country started moving into recession and the extent of the financial crisis started becoming obvious that the exchange rate fell away.

4.1.4. The relative success of New Zealand monetary arrangements and policy

The best test of the New Zealand arrangements is that they have been widely copied and represent what is close to the state of the art as described in Woodford (2003). It is not simply the monetary policy that has been copied but the clear institutional framework, with the bank having a clear target, the instrument independence to achieve it, and established arrangements for accountability that entail substantial transparency, particularly about the future needs of policy.

Other countries have been able to learn by New Zealand's mistakes and to prepare properly for inflation targeting rather than learn by doing. Overall other countries have not gone for the personal responsibility of the governor but for decision making by committee. They have also avoided the stage of having a stricter and shorter run target. None has yet given up inflation targeting because it does not work.

Nevertheless New Zealand has revealed starkly that there are severe problems for small open economies with idiosyncratic difficulties. With a flexible exchange rate fluctuations can be unpleasant. Its near neighbour Australia which was slower to adopt inflation targeting and has followed a medium term focus from the start has fared rather better. Thoughts of currency union have been dismissed but some route to more sustainable and faster growth is clearly desired. When New Zealand underwent its programme of radical reform in 1985-95 it was widely expected that it would be able to recapture much of its position as one of the more successful OECD countries. That has not happened. Could monetary policy have done more?

4.1.5. Financial stability and financial supervision

The RBNZ is also the financial supervisor in New Zealand of all sectors except securities markets. It has long been the supervisor of banks but only recently required responsibility for insurance and for other parts of the financial sector which until that time had remained largely unregulated. This shift to increased regulation reflects the failure of most finance companies during 2007 and 2008, not as part of the global financial difficulties but as a result of heavily concentrated lending, inadequate risk assessment and exposure to volatile sectors such as used-vehicle finance. The New Zealand economic cycle was in advance of the problems in the US and as the economy peaked so the risks were revealed.

Financial supervision in New Zealand is unusual in a number of respects. First, since 1996 it has been based on a disclosure regime where banks are required to make quarterly public disclosures of major features of their income and expenditure and balance sheets such as peak exposures and concentration risk as well disclosing their methods of risk management. Bank directors are personally liable for these statements, which have to be produced by branches as well as subsidiaries.

Along with Australia, New Zealand has been alone in the OECD in having no deposit insurance (until guarantees were issued during the global crisis). To counter this, the RBNZ has strong powers of intervention and resolution and would step into a failing bank as statutory manager, writing down all claims following a summary assessment so that the bank is effectively recapitalized and able to be open for business without a material break. The process is known as 'bank creditor recapitalisation'. It has never been used in practice.

All New Zealand's main banks are foreign (Australian) owned. As a result the RBNZ not only insists that all significant banks must only be subsidiaries and not branches but that they must be credibly able to operate on their own without parental or other support within a day of the failure of any system, including the parent. This results in a recognition of the problems of cross-border banks, which is without parallel in the OECD. Again it is untested. It is not applicable in the EU/EEA because of the passport principle and the inability of host country supervisors to deny entry to a foreign owned branch that is properly registered in its home country – despite any realistic fears they may have over the lack of ability of the home country to provide adequate support as illustrated by Iceland.

4.2. The Swedish Krona and the Link with the Euro

4.2.1. Twin Objectives, Controlling Inflation and Keeping the Krona in the EMS.

Before the switch to inflation targeting, Swedish monetary policy in the late 1980s was directed towards reducing inflation and keeping a stable exchange rate. Sweden had followed the policy of having an exchange rate peg from the Bretton Woods days. On the break up of Bretton Woods it joined the 'snake' of European currencies in 1973 and on leaving in 1977 established a peg against a trade-weighted basket with a 2.25% band of permitted fluctuation in line with the normal limits of the day. There were devaluations in 1981 and 1982 but thereafter the exchange rate remained fixed until a forced exit from the ERM of the EMS in 1992. It is widely argued (see Jonung et al, 1996, for a summary) that the Swedish economy was following an increasingly unsustainable course. Progressive bouts of inflation had made Swedish industry increasingly uncompetitive but strong countercyclical policies meant that 'the public sector acted as employer of last resort', and in each downturn public sector revenue had to rise to match it. After the last adjustment in 1982 it was arguable that this process could not be taken any further.

The problems with the fixed exchange rate system began to emerge again around 1988 when the run-up to the Swedish financial crisis began to take shape. Assisted inter alia by financial deregulation the Swedish economy grew steadily during the mid-1980s but by the end of 1986 pressures began to emerge. Inflation, which had fallen to 4%, began to rise and unemployment, which had been falling, passed below 2% in 1987. Interest rates did not really respond until into 1988 and it was only when the exchange rate started to be threatened in 1990 that they moved sharply upwards. This in combination with fiscal measures started the economic slowdown. This continued into 1991, at which point, with the Soviet Union disintegrating, Sweden decided to apply for membership of the EU in December 1990 and in May the exchange rate peg was switched from the basket to the ECU as Sweden joined the ERM of the EMS. This process resulted in a fall in interest rates, and margins with respect to Germany fell.

However, this was the point at which German interest rates began to rise as the country started to come to grips with the consequences of unification. Thus rather than helping turn Sweden round after a year of recession, monetary policy had to tighten. Finland made the problem worse by devaluing in November 1991, triggering fears of a matching devaluation in Sweden, which required a further increase in interest rates to offset. This sharp increase by 600 basis points worked but there was only a limited opportunity to relax when speculation eased. The recession continued into 1992. This downward pressure was successful in reducing inflation, which reached 2%. With rapidly rising unemployment and a worsening public sector deficit the requirements for monetary policy were becoming clearly contradictory.

An easing was required for turning the economy round but concerns over sustainability putting pressure on the exchange rate argued for a tightening in order to remain within the ERM bounds. In September 1992 the Riksbank again tried the tactic of a sharp but it hoped short-lived increase in interest rates to induce confidence in the foreign exchange market.

The need for interest rate rises proved far greater than anticipated. The Riksbank planned to increase short interest rates by 50%, i.e. from 16% to 24% in early September but instead found itself compelled to raise them *to* not by 75% for four days. The attempt to return to more normal rates failed and after 3 days the Riksbank raised interest rates to 500% on 16 September and kept them there for 5 days. This unusual show of resolve was successful in the sense that the exchange rate peg held and the interest rate could be lowered to 50% and subsequently eased to more normal levels over the succeeding weeks. However, this did not last and in mid-November 1992 Sweden experienced a further run on the currency. This time the extraordinary interest rate defence was not repeated and the krona was floated on 19 November.

4.2.2. Inflation targeting

Sweden's adoption of inflation targeting followed simply from the abandoning of the exchange rate peg. Two months elapsed before the new policy was announced – of managing inflation during 1993 and 1994 such that an inflation target of 2% with a tolerance band of 1% either side could be followed from the beginning of 1995 onwards, by which time the temporary inflationary effects of the enforced depreciation of the exchange rate would have worked their way through the economy. It is not immediately clear what governed the particular choice of target (Heikensten and Vredin, 1998) but this choice is similar to that made by Canada and the UK, similar to the implied target for the Bundesbank and also similar to the prevailing rate of 'underlying inflation' in Sweden at the time. Matching German inflation would make readoption of a fixed exchange rate plausible. However, the primacy of the fight against inflation in achieving employment and growth goals had already been enunciated by parliament in 1991.

One interesting remark in Heikensten and Vredin (1998), given Sweden's history of targeting the price level in the 1930s (Berg and Jonung, 1999), is 'More knowledge is needed before it can be said whether an inflation target is preferable to a price level target' (p.8). This view is repeated in Berg (2000).

There was no strong consensus for pursuing a floating exchange rate regime in Sweden when inflation targeting started. With the economy very firmly in recession in 1993 policy makers faced the unusual circumstance that they could achieve price stability in the new regime while cutting interest rates. Bernanke et al. (1999) question the commitment of the political parties to the target and suggest that they may have been leaving themselves the option of a more expansionary policy if the economy did not turn round rapidly enough. At that stage the Riksbank was only partly independent and while it was the initiator of the policy the government would have had the opportunity to make a change. Independence came in 1999.

In practice the Riksbank used the two transitional years to develop the approach to inflation targeting. Initially no forecasts were published. A document entitled 'Inflation and Inflation Expectations' was published three times a year, which began to include an increasing number of forward-looking indicators.

In practice, however, policy was forward-looking, and after the initial easing was completed it was the prospect of inflation that led to a tightening. Initially it was not clear what emphasis was given to measures of underlying inflation compared to the headline and a degree of ambiguity surrounded policy. This has been steadily dispelled as policy has developed leaving the Riksbank as one of the most transparent, a point we return to in the next section.

A change in format was adopted in 1996 with the introduction of quarterly 'Inflation Reports' and a much more thorough analysis of prospects incorporating an explicit forecast of inflation. This pattern lasted until 1998 when the Riksbank introduced an (asymmetric) interval round its forecasts (fan chart) (based on a two-piece normal distribution) to give an idea of the probabilities of various inflation rates rather than a simple best guess (Blix and Sellin, 1998). The time horizon for policy had also become clearer, with the Riksbank looking 18-24 months ahead (Heikensten and Vredin, 1998) and following a policy of smooth reactions to shocks. Unlike New Zealand they were not so concerned with immediate breaches of the target band provided they could see inflation falling back within the band over the policy horizon.

Somewhat in the pattern of the UK, the Riksbank developed inflation targeting substantially first and became independent in the modern terminology second, as incorporated in the Riksbank Act of 1998, which came into force in 1999. However, the change in the structure of the decision-making body and there responsibilities has made an important difference to the clarity and focus of policy communication. Previously the Governing Board of the Riksbank, which contained outside representatives including the chairman, was responsible for policy. With the new Act a six member Executive Board became responsible, with the Governor as Chairman. The members of the Board are explicitly not to seek or accept instructions in monetary policy matters, nor is any public authority permitted to issue instructions to the Riksbank in this regard.

Figure 8

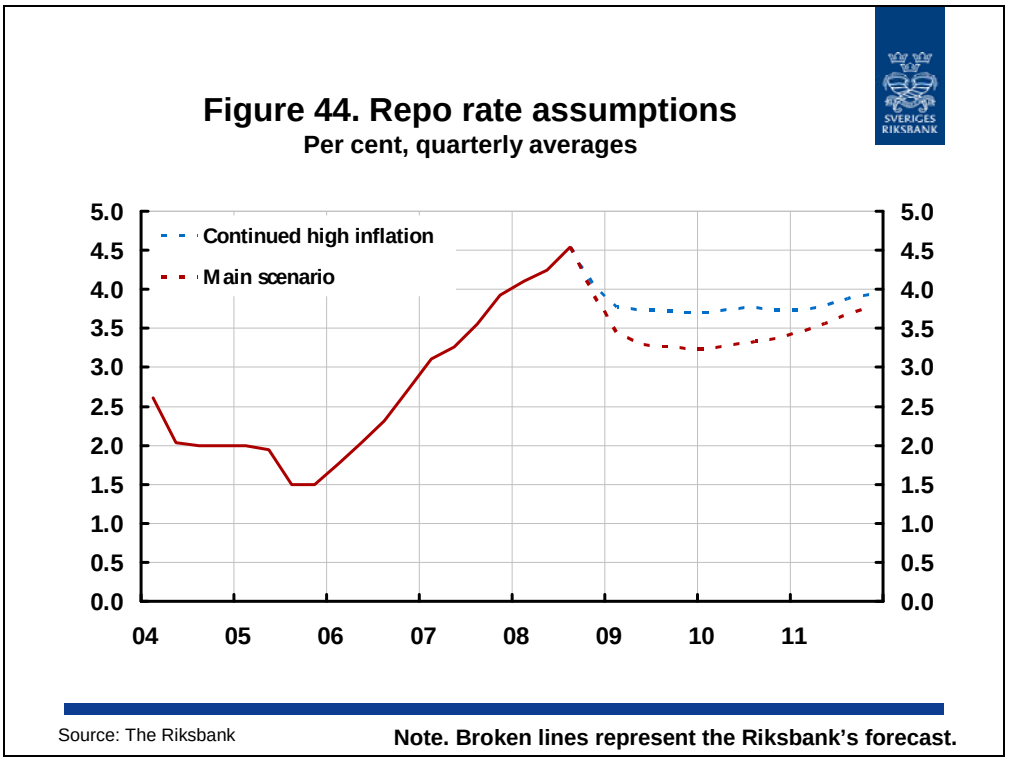
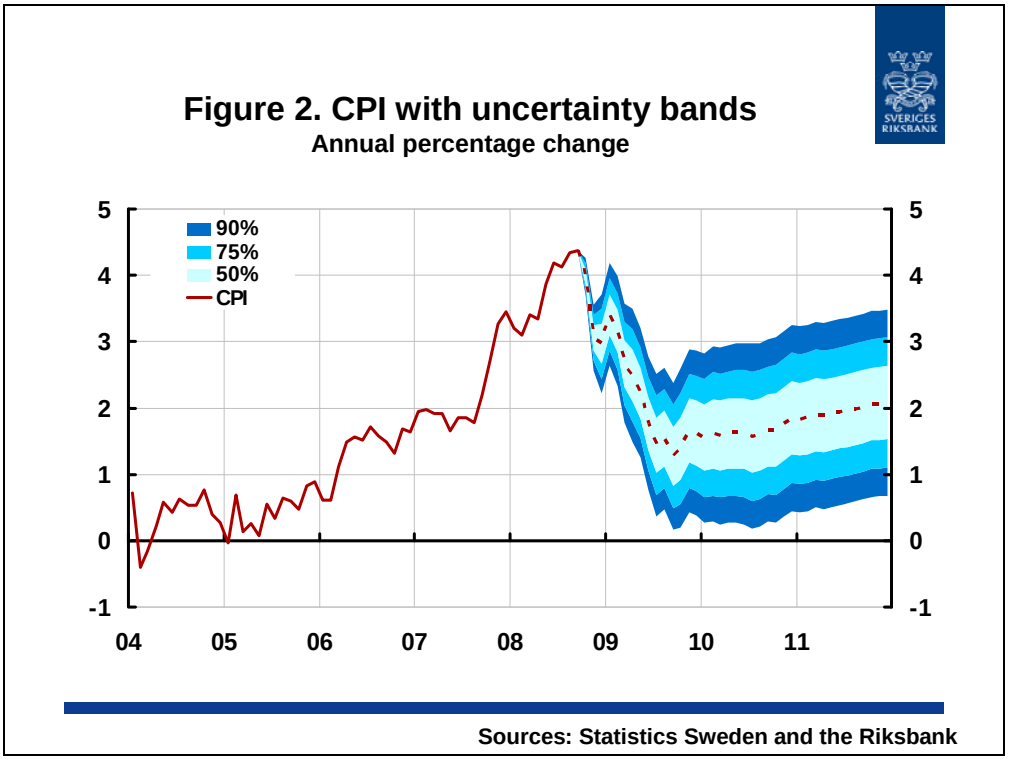


Figure 9



4.2.3. Communication policy

When the Riksbank switched to producing an Inflation Report in 1996 the Governor then wrote a signed comment at the beginning rather than the head of the Economics Department, changing the status of the document from a support for policy to a direct policy tool in its own right. This has been emphasized again with the change in title of the Inflation Report to Monetary Policy Report in 2007. These Monetary Policy Reports are produced in conjunction with alternate of the six regular meetings that the Executive Board holds on monetary policy each year. On the other three occasions an Update is now published. (The policy statement is now signed by the Executive Board as a group.)

However, the granting of independence produced a clear change in behaviour that enhanced transparency in the interest of both accountability and the better communication of policy. The Riksbank now uses the Monetary Policy Reports as the regular written reports for parliament that have had to be delivered since 1988 and the governor appears before the Parliamentary Standing Committee on Finance when these are considered.

Minutes are now produced of the Executive Board's policy-making meetings and they are published, initially with a lag of 6-8 weeks that has now shortened to 2 weeks. These minutes are necessary as each of the members of the Executive Board is individually responsible for their actions, rather than the Board acting as a single unit. The minutes are therefore detailed, setting out the presentations made by the staff to the Board, each member's contribution to the discussion in the order they occurred, as well as the eventual decision, the votes and the nature of any disagreement that the dissentients had. It is difficult to conceive how any further useful information could be published, without diminishing the quality and clarity. The Federal Open Market Committee (FOMC) experience has already demonstrated that publishing an exact record can lead to the reading of prepared statements, an element of grandstanding and a rather weak debate. It also has the danger of pushing the real debate out of the decision-making meeting into less formal gatherings where no record is kept.

The Monetary Policy Reports are firmly driven by a model based assessment of the needs of monetary policy. They follow a clear format on each occasion with a summary signed by the Executive Board, an analysis of the prospects for inflation, beginning with the fan chart summary, followed by an analysis of the risks and some alternative scenarios, and then an exposition of the current position (articles on related topics are usually included). The Report is thus based heavily on decision-making under uncertainty and gives outside decision-makers not simply a clear view of the problems being faced but of the thinking that underlies the strategic response. As with the New Zealand projections, policy is endogenous and the leading fan chart sets out the prospective evolution of the policy interest rate on the basis of the current knowledge set out in the rest of the document.

4.2.4. The success of Swedish monetary policy

Like several other central banks the Riksbank not only has a regular assessment of the quality of its policy by parliament but it has commissioned and published an independent review of its policy in the period 1995-2005 by Francesco Giavazzi and Frederic Mishkin.[39] This constitutes a very favourable assessment.

[39] Available on the main webpage on Monetary Policy
http://www.riksbank.com/templates/SectionStart.aspx?id=10602

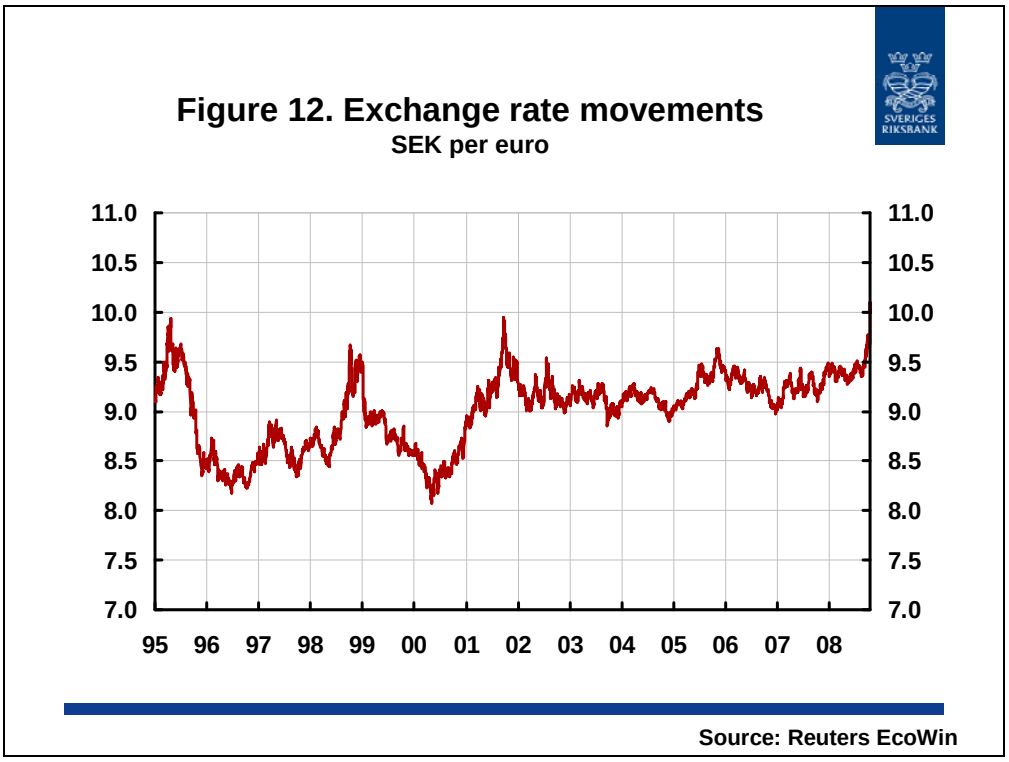
While the Riksbank has been criticized for lowering interest rates too slowly when inflation targeting was introduced, the authors conclude that the pace was appropriate as it reflected the slow return of fiscal policy to sustainable prudence. In the last 2 years of the period assessed, the Riksbank simultaneously overestimated inflationary pressures while under-estimating the rate of economic growth. If anything, this appeared to be because the Bank had not detected a structural change in the economy. However, other forecasters were no better at predicting this problem.

The very favourable overall assessment was reflected in the fact that there were only nine recommendations, none of which were fundamental criticisms. The Riksbank has responded to these criticisms, which related inter alia to the need for greater clarity over the role of asset prices, flexibility and the future path for interest rates (the latter being covered by the switch to model rather than market-based projections). One structural problem the reviewers highlighted was that the Executive Board in the Riksbank plays two roles – as monetary policy decision-maker and as manager of the activities of the Bank. It questions whether some at least of the members ought to be spending the whole of their time on monetary policy.

However, perhaps more relevant is a comparison of the success of Swedish monetary policy with that of the ECB. Sweden has chosen firmly to run an independent monetary policy and keep a floating exchange rate rather than join the euro area as it was obliged to do by the versions of the EU Treaty that have been in force since Sweden's entry was negotiated. In a report commissioned by the government in 1996 before the euro area started the general conclusion was that there was little to lose by staying out until unemployment was reduced and the conditions for being able to respond to idiosyncratic shocks in a relatively costless manner were in place (Calmfors et al., 1997). (This contrasts with the report in Finland shortly afterwards that came to a similar relatively neutral assessment of the costs of membership but looked favourably on membership as a means of forcing flexibility and structural change – Pekkarinen et al, 1997.)

The fact that Sweden later voted firmly not to join the euro area in a referendum in 2003 emphasises that by that point there was no evidence from the early years of the euro area that macroeconomic outcomes would have been served better by such a change in monetary policy. Subsequently the Swedish record on inflation has been rather better than that of the ECB, if anything straying too much below the target band as mentioned above, and not more inflationary. Policy has not needed to be much more active and the Swedish economy has not been more volatile than those of its partners.

Figure 10



Note: ECU prior to 1999.

It is only in the recent phases of the present financial turmoil that a distinction has emerged. With some of the larger Swedish banks under some strain, in part because they have been the major force in the financial development of the Baltic States, which have shown a dramatic slowdown, the exchange rate has rapidly depreciated against the euro following a steady performance over the previous 7 years (see Figure 10). While the Riksbank views such a depreciation as a normal problem faced by small countries in times of uncertainty, it went as far as increasing interest rates marginally at its September 2008 meeting (by the Governor's casting vote) at a time when others have been reducing them. This decision was more than reversed at the October meeting when interest rates were reduced by 50 basis points in line with the ECB. Inside the euro area there would have been no such pressure. But it will take the passage of time to tell whether this short run impact in response to what for many countries is the biggest adverse financial shock in over 70 years is going to be reversed when the immediate general loss of confidence in the world diminishes or whether it reflects an underlying weakness in the monetary policy strategy compared with that of its immediate Nordic neighbour Finland which is in the euro area.

4.2.5. Financial Supervision and Stability

The Riksbank is not the financial supervisor in Sweden and was not the supervisor in the past. An integrated supervisor was formed in 1991, under the Ministry of Finance, bringing together the separate banking and insurance supervisors. This integration occurred shortly before the Swedish banking crisis broke and is a coincidental rather than a consequential move. Both the Riksbank and the Swedish Financial Supervisory Authority were heavily involved in the resolution of the crisis.

The current Governor of the Riksbank, Stefan Ingves, then Deputy Governor in charge of financial stability, went on to the IMF where he was responsible for the work of trying to get stronger institutional frameworks in the member countries through the Financial Sector Assessment Programmes. These assessments, which began in 1999, form part of the Financial System Stability Assessments conducted by the IMF. This has enabled the Swedish experience in a substantial financial crisis to percolate through widely in the world.

The association between the Riksbank and the supervisory authority is described as 'close collaboration' by the Riksbank. The new head of the supervisory authority, appointed in 2008, is the former head of financial stability in the Riksbank.

4.3. The Baltic Republics: Currency Boards and the exchange rate as a strategic goal[40]

4.3.1. Adopting a Currency Board

There is a tendency to lump the Baltic States together but it was Estonia that was the pioneer of the currency board arrangement soon after it became independent from the Soviet Union in 1992 – choosing to peg to the Deutschmark – Lithuania followed in 1994, pegging initially to the US dollar, but Latvia pegs directly to a currency basket and has not followed the currency board route. However all of them have been characterised by a wish to have a very strong currency peg as the route to price stability.

At the time Estonia opted for the currency board approach it was unusual, confined to a small number of countries in ex-colonial regimes, with Argentina being the main recent example (April 1991). The IMF initially opposed Estonia's plans but have since changed their mind and supported currency boards in other similar circumstances where there was little monetary credibility and the need for a new currency in an open economy.

After 16 years it is difficult to understand how Estonia was able to cope on regaining its independence in 1992 as it, along with the other Baltic States, had been an integral part of the Soviet Union for nearly 50 years since the end of the War. It had no central bank (although the buildings still existed from before the War), the currency in circulation, the rouble, was rapidly becoming worthless, much of the economy was involved in uncompetitive production, dependent on other Soviet markets, that had been cut off.

Fortunately, the economic independence of Estonia and the other Baltic States from the Soviet Union was presaged in the Gorbachev era, with active planning beginning in 1987, the Law on Economic Independence being passed in November 1989 and the Bank of Estonia being formed on 1 January 1990. A three-person Monetary Reform Committee was set up in March 1991 (composed of the Prime Minister, the Governor of the Central Bank and an expert), independence came in August and the currency board was implemented in June 1992. Lithuania took longer to introduce a currency board and experienced a longer period of high inflation as a result. Furthermore when the board was introduced the peg was to the US dollar not the DM. The argument behind this was that most of Lithuania's trade was denominated in dollars (particularly any exports from its oil refinery, situated at the end of the pipeline from Russia). Some of this dollar focus may have been illusory (Alonso-Gamo et al., 2002). As soon as membership in the EU euro area became a proximate possibility Lithuania switched the peg to the euro (February 2002) in a move announced well in advanced.

[40] This section focuses mainly on Estonia.

Latvia also switched its peg to the euro on 1 January 2005 prior to joining ERM2 on 2 May. It operates with 2.25% round the central parity, making it similar to most fixed exchange rate regimes although not as tightly bound as that of Denmark to the euro.

In both the Estonian and Lithuanian cases the exchange rate which was picked reflected a round number choice at the prevailing rate. However, these rates themselves reflected that great difficulties facing the countries at the time, with a shortage of foreign exchange, so in terms of purchasing power parity (PPP) these rates were clearly low. This therefore set up the prospect for considerable real appreciation as the situation normalised and exporting activities picked up. As discussed later, the level of the exchange rate picked initially may have important consequences for the process of convergence. A low rate may offer an advantage in terms of price competitiveness in the early stages. However, it is unlikely to be price that is holding back exports but simply the ability to produce items that are competitive in quality and style. Large swathes of production that may have been successful in the Soviet Union would have been unsaleable in open competition. Once production got underway the low valuation would imply the opportunity for considerable inflation without harming competitiveness. Added to more rapid productivity growth than in Western Europe, in itself permitting rapid inflation without loss of competitiveness, this lays the ground for persistently higher inflation over an extended period, without even the need to resort to the Balassa-Samuelson effect to explain it. Given that the Masstricht criteria for membership of the euro area focus only on nominal criteria this prima facie builds up a problem.

With a floating exchange rate some of the adjustment can come through a nominal appreciation, which may make joining ERM2 rather easier. Hence as discussed below in the case of the Czech Republic, there may be a case for a multistage strategy: adopting a hard peg initially until inflation is brought down, then following inflation targeting to stand a better chance of controlling inflation and finally entering ERM2 for the final two years when convergence seems well set. Estonia joined ERM2 at the first real opportunity (28 June 2004) following membership of the EU on 1 May 2004.

4.3.2. Experience with Currency Boards

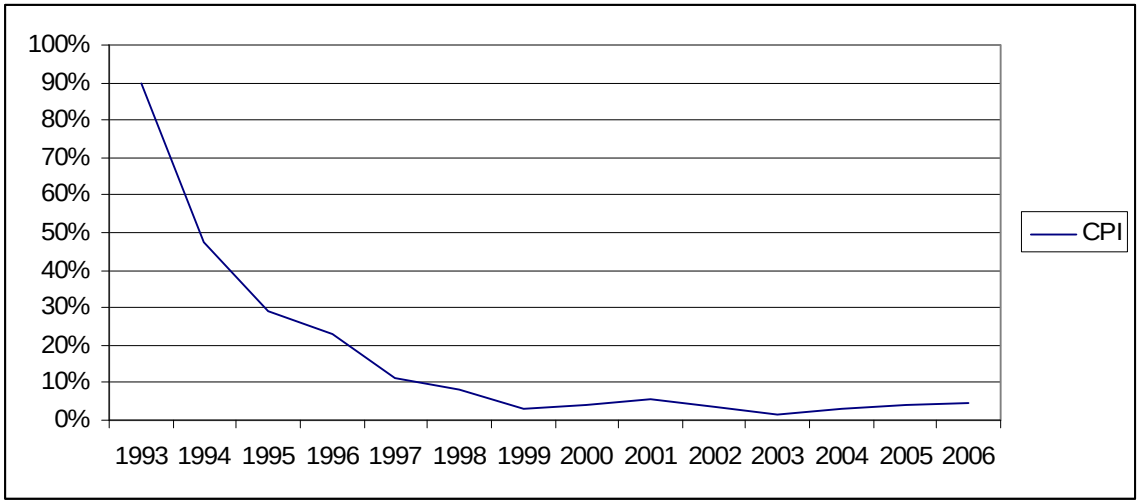
A currency board is no *panacea*, and if it is to work well it needs to be accompanied by the policies that are associated with all successful monetary policies, such as the rule of law, good institutions, a prudent fiscal policy, political stability and a flexible economy. In many respects it has been the focus on these facets that has characterised the Estonian regime and indeed its success. Fiscal responsibility has been high on the list, with an avoidance of debt and seeking to ensure that the public sector is not in deficit each year. Even in the current extremely difficult economic circumstances this has been maintained.

Prima facie having a currency board (like any fixed exchange rate regime) puts much more emphasis on fiscal policy, as monetary policy cannot respond to any idiosyncratic shocks. Hence having a fiscal policy that does not have a strong countercyclical element to it (through automatic stabilisers) puts the onus firmly on the private sector. Comparisons with the euro area countries suggest that Estonia is more flexible in setting prices (Mayes, 2009). Not only are prices changed more frequently and are more related to competitive pressures rather than generalised rules, but firms are more ready to reduce prices, leading to less asymmetry across the cycle than in many other countries. A similar flexibility lies in the labour market, not simply in terms of hiring or firing but in the ability to reduce labour costs even to the extent of being able to reduce nominal wage rates in some circumstances.

The nature of household behaviour has also helped. Consumption has been less volatile than income, particularly in the period of rapid increase in income in the last five years. The same is true of the gearing up of bank lending and household indebtedness. The economies began with little bank lending and with little use of housing as collateral. Not surprisingly house prices have risen rapidly but, even if house prices fall substantially, the extent of negative equity is likely to be limited. In part this is due to prudent lending by the banks, in part due to the caution of borrowers following the difficult early years of independence, rather than simply to the regulatory system.

There have been two strong tests of the currency board approach. The first was the Russian crisis and default of 1998 and the second is the present financial turmoil. Clearly in the second case we do not as yet know the full outcome. In the first case, however, the Baltic States came through remarkably well. The effect depended on the strength of their links with the Russian economy. Of the three Baltic States, Estonia had the most limited links. Inflation fell steadily from a peak of around 80% per month when the currency board was being introduced to 80% for the year in 1993, falling below 10% at the time of the Russian crisis and continuing to fall through into 1999 since when it has stabilised at around 4% a year. The process of convergence of GDP per head stalled for a year in 1999 but otherwise it continued each year. The shock was thus weathered with little difficulty.

Figure 11: Inflation in Estonia 1993-2006



Source: Mayes (2009)

While it is true that having a currency board makes it difficult to offer any lender of last resort facilities unless there are excess reserves, it is not clear how important a problem this is in countries with almost no domestically owned banks. The Baltic States still retain noticeable exposure to Russia, particularly through energy prices and so in current circumstances they are more vulnerable than many of the other new Member States. Nevertheless, the extent of their considerable current account deficits has until recently been little cause of concern. In Estonia, for example, where the deficit exceeded 10% of GDP before the current crisis, it has now fallen back to a very low level, once the profits of the banks are subtracted. In the past these profits have been reinvested so while they represent the major element in the deficit they have not represented a challenge to the currency board. In Latvia the Bank of Latvia expects the 2008 current account deficit to be halved in 2009 on the back of the recession, but the fiscal effect is substantial and the fiscal deficit will hence breach the Maastricht criterion for a while.

However, in the fight to re-establish confidence, it would be an unusual government that did not try to exude enthusiasm that the shock will be short-lived and that a sustainable convergence path will be regained with in a year or two.

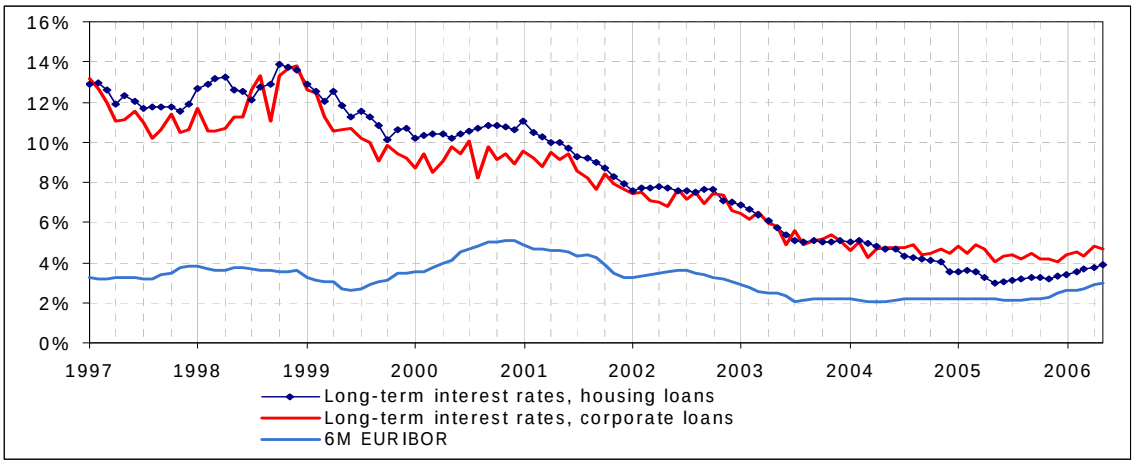
4.3.3. Joining the Euro Area

In the early and mid-1990s the concern of the Baltic States was simply to stabilise the price level and recover from the major dislocation of the early post-Soviet years. The currency boards were not seen as an explicit long-term strategy. Indeed in the case of Lithuania it actually had an exit strategy planned, which was then not implemented in the aftermath of the Russian crisis.

However, as the currency boards continued to be successful and the prospect of EU and then euro area membership came closer, it looked plausible to go straight from the currency board to the euro. (It was not clear immediately that it would be necessary for currency board countries to go through ERM2, at least technically, and hence the speed of entry could have been expected to be more rapid.) As it has turned out, however, entry has not proved as easy as many expected, none of the Baltic States has as yet joined – Lithuania failed to meet just the inflation criterion by 0.2 percentage points in 2006 and its inflation path was judged unsustainable– and the currency board in Estonia has now lasted more than sixteen years.

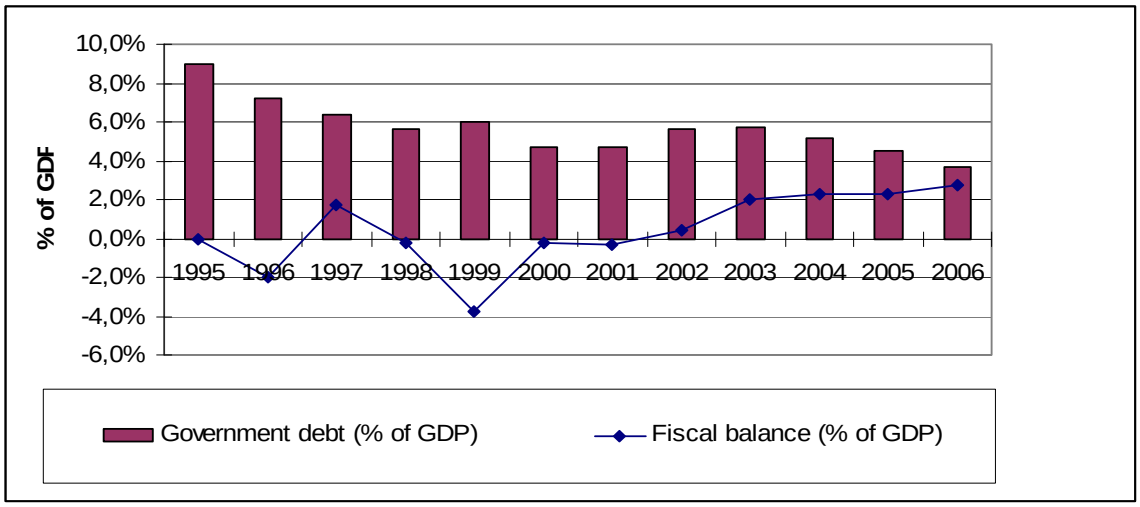
Estonia also meets all of the criteria for membership save inflation. It is difficult to date the onset of firm credibility for the Estonian regime but using interest rates as a guide (see Figure 12), they had fallen below 5% by the time of EU membership in 2004. Since Estonia has no longer-term government debt (see Figure 13) it is only possible to look at commercial lending rates. Figure 13 also shows that Estonia has met the Maastricht fiscal criteria from the outset, with a slight blip in the deficit over 3% in the aftermath of the Russian crisis in 1999.

Figure 12: Interest rates in Estonia and the euro area



Source: Mayes (2009)

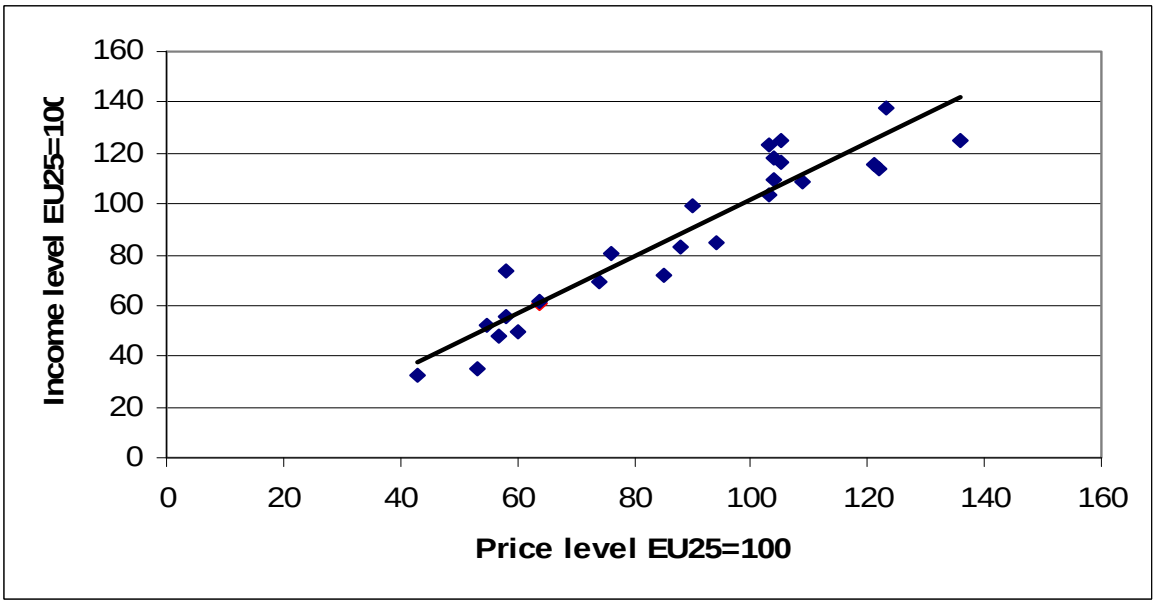
Figure 13: Government debt and the fiscal balance, Estonia



Source: Mayes (2009)

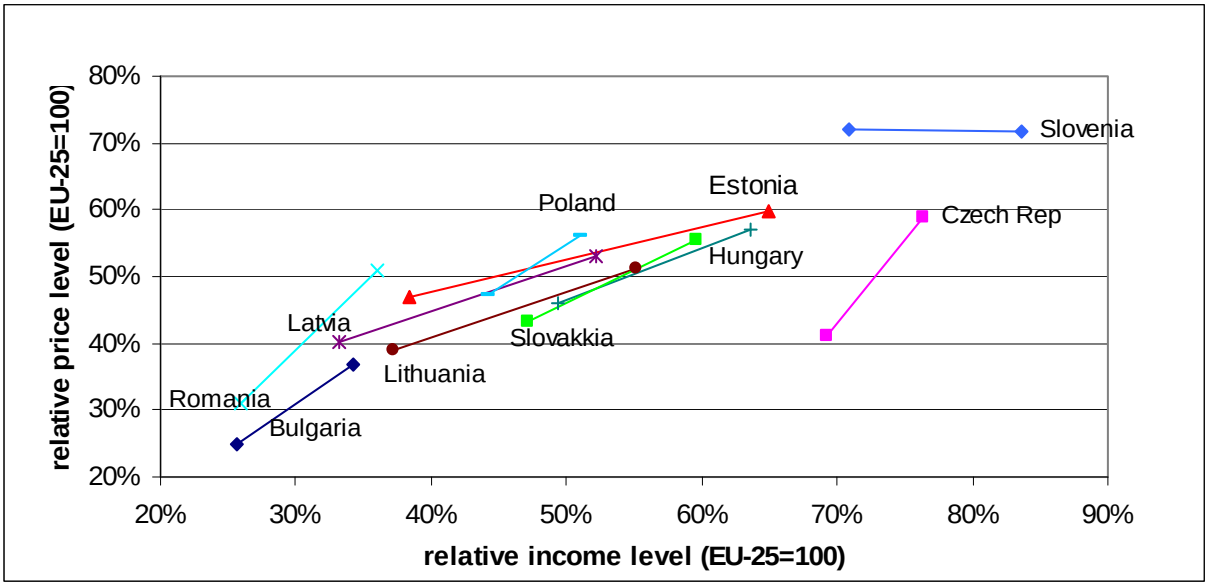
The problem is general to the new Member States. There is a strong correlation between income level and price level (Figure 14), which on the whole is maintained in changes over time (Figure 15). There is just one obvious exception, Slovenia, where real convergence has been achieved without price convergence because the principal aim of monetary policy was to stabilise the real exchange rate. (If anything the inflation targeting countries, especially the Czech Republic have shown a faster convergence in price levels relative to income convergence but this is only a visual observation not a statistically testable hypothesis.)

Figure 14: Price and Income Levels of the EU Member States, 1999-2006 averages



Source: Mayes (2009)

Figure 15: Changes in relative income and price levels in the new EU Member States 1997-2006



Source: Mayes (2009)

If Estonia had been assessed for membership of the euro area on the day it joined the EU, it would have met the criterion but this has not happened since. Indeed the irony is that if the current downturn turns out to be really bad in the Baltic States, then they might meet the criteria soon. Clearly it makes no sense to fabricate convergence, either by having a bout of sustained inflation or deliberate recession. Hence we can expect that meeting the criteria as they are currently interpreted will take some time while real convergence continues. Since there is no means of telling where that process may end as it can be above or below the average income per head of the other Member States, it does not make any sense to have a time bound strategy for membership, even though for all three countries the answer is 'as soon as possible', as it is always possible that some asymmetric shock might lead the currency board or the exchange rate peg to collapse, whereas this is not possible inside EMU.

Latvia is currently experiencing the greatest problems among the three countries. The Bank of Latvia is currently forecasting a fall in GDP of around 4% in 2009 and the country has had to seek an IMF loan. The major difficulty is that unlike the other two countries Latvia retains a significant domestically owned bank, Parex, in which it had to take a majority share on 9 November 2008. With foreign-owned banks, depositors can benefit from the guarantees that have been issued by the governments in the parent countries.[41] Without the IMF and acceptance of State responsibility for the bank it was impossible for the Latvian authorities to offer an equally reassuring guarantee so the bank lost deposits. However, it is not clear that there is any problem for monetary policy. Foreign exchange reserves are 130% of base money.

[41] Although technically deposit insurance from the parent country only applies to depositors in foreign braches within the EU/EEA a guarantee of the parent with effectively apply to the whole group, whether it operates abroad through branches or subsidiaries. Reputation risk would make it very unlikely that a solvent parent would allow a subsidiary to fail.

4.3.4. Financial stability and supervision

Initially the Bank of Estonia was also responsible for financial supervision. With a very small banking sector and a general lack of expertise this made sense. Along with many other transition economies Estonia experienced the collapse of many of the initial locally capitalised banks that set up and the country has ended up with a banking system that is almost totally foreign-owned with most of the parent banks being headquartered in Sweden. Banking supervision was split off from the Bank of Estonia in 2002, including the construction of some physical barriers between the Bank and the supervisory agency in the Bank. However the two organisations remain very close and the supervisory agency is an agency of the Bank of Estonia. At the same time the agency acquired responsibility for insurance and securities markets, which had previously been dealt with separately.

This style of arrangement probably gets the best of both worlds. Supervision is unified in a single agency with an independent mandate but the links with the central bank remain strong and there is administrative cooperation that reduces the costs, somewhat along the lines of the relationship between the Bank of Finland and the new unified supervisory agency. The link with Finland is more than just geographical proximity and linguistic affinity. Finland's largest bank Nordea has a branch in Estonia that has 10% of the market, making it of systemic importance. While under EU rules this branch could be supervised directly from Finland the Finnish authorities decided to operate supervision after Estonia's membership of the EU with the Estonian supervisor acting as an agent, thus providing a closer relationship between supervisors than exists for some other cross-border banks in the EU.

4.4. Changing monetary regimes in the Czech Republic

4.4.1. Lessons from the dissolution of the Czechoslovak Monetary Union

The delimitation of monetary areas is usually determined by political not economic circumstances and the division of Czechoslovakia is no exception. Thus, it is a little difficult to set out exactly what natural experiment we are able to observe. We can focus on three main issues.

The first is an illustration of how a monetary union can be dissolved in a smooth and relatively costless manner. Any monetary union tries to make exit to a different regime look highly unlikely as otherwise that would damage its own credibility and make that exit more likely. One of the easiest ways to do that is to make the change appear extremely expensive in advance so that markets would consider that it would have to be unbelievably harsh circumstances that would prompt such a decision. However, at the time, given the decision, imposing any such costs would make a difficult situation even worse, especially since it is likely that it is the country/region in most difficulty that has to take the decision. It is relatively rare for the strong to leave as they can normally dominate the policy, although if they are small as in the case of Singapore, it may make sense.[42] Nevertheless there are clear examples in the structure of the Czech and Slovak economies on exit from the CMEA[43] regime that make the choice of separate currencies a reasonable proposition on economic grounds. The existence of separate administrations also made it technically rather more straightforward then it would be if none of the apparatus of separate government existed.

[42] Singapore was small compared to Malaysia but financially much stronger so it made sense for it to opt for separation.
[43] Comecon or **C**ouncil for **M**utual **E**conomic **A**ssistance.

The second issue, therefore, is to consider the trajectory of monetary policy after separation. To what extent did the choice of policy reflect the particular circumstances? It would not be very productive to ask what would have happened if the monetary union had continued, since this is unlikely to be productive as the political tensions that led to the separation would not have disappeared, with no way to know the effect this might have had on the subsequent path of economic development.

What we can do, however, is to notice that the path to joining EMU has been different. Slovakia has become the most recent member of the euro area, while the Czech Republic is still some years away from achieving nominal convergence. If you had asked people to bet on which of the two countries would join EMU first at the time of separation, it is probable that the bulk of bets would have been on the Czech Republic rather than on Slovakia. The former was more advanced with GDP per capita about 20% higher while the latter had more CMEA-related industry that would need to be unwound.

We therefore deal with monetary policy in the transition in the next section while considering convergence to EMU in the third. The remainder of the present section deals with the separation itself.

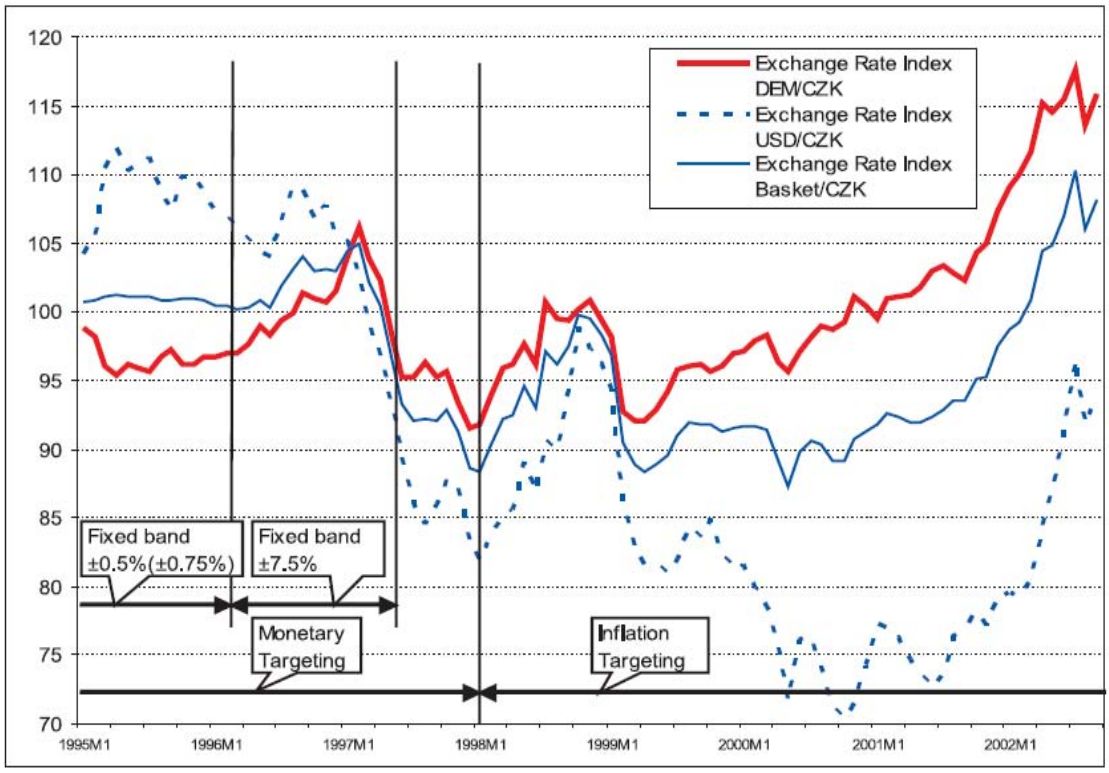
The Czech and Slovak Republics were separated on 1 January 1993. The process had been quite rapid during the previous year after a debate about whether the two entities should move closer together or further apart. The 'velvet revolution' approach of November 1989, when the communist government lost power without bloodshed, was applied on this occasion as well with national assets being split on a 2 to 1 basis reflecting population. The new currency for Slovakia came on 8 February, with the overstamping of the existing joint banknotes pending a new issue of both notes and coin during the year. A similar process occurred in the Czech Republic.

4.4.2. Inflation Targeting Strategy

After separation the Czech Republic followed a similar policy of exchange rate targeting, initially using a basket of five currencies (reduced eventually to just the US dollar and the Deutschmark), assisted by an M2 target and the objective of reducing inflation steadily. Up until 1996 there was no great problem from having multiple targets as the stable exchange rate target clearly predominated and it was initially possible to operate with a narrow band of +/- 0.5%. The M2 target tended to be exceeded and inflation remained. However, it became clear that something more effective in achieving price stability was required as capital inflows increased during 1995. The exchange rate target then began to rise and another nominal anchor was required – the exchange rate band widened to +/- 7.5% in February 1996. The Czech National Bank (CNB) therefore prepared very thoroughly for making a transition, focusing on inflation targeting as the obvious alternative for a small open economy. There was an exchange rate crisis in May 1997, when the koruna had to be devalued by 10%. Added to this, regulated prices began to increase rapidly as part of a concerted move to market levels.

Figure 16: Nominal Exchange Rate Index

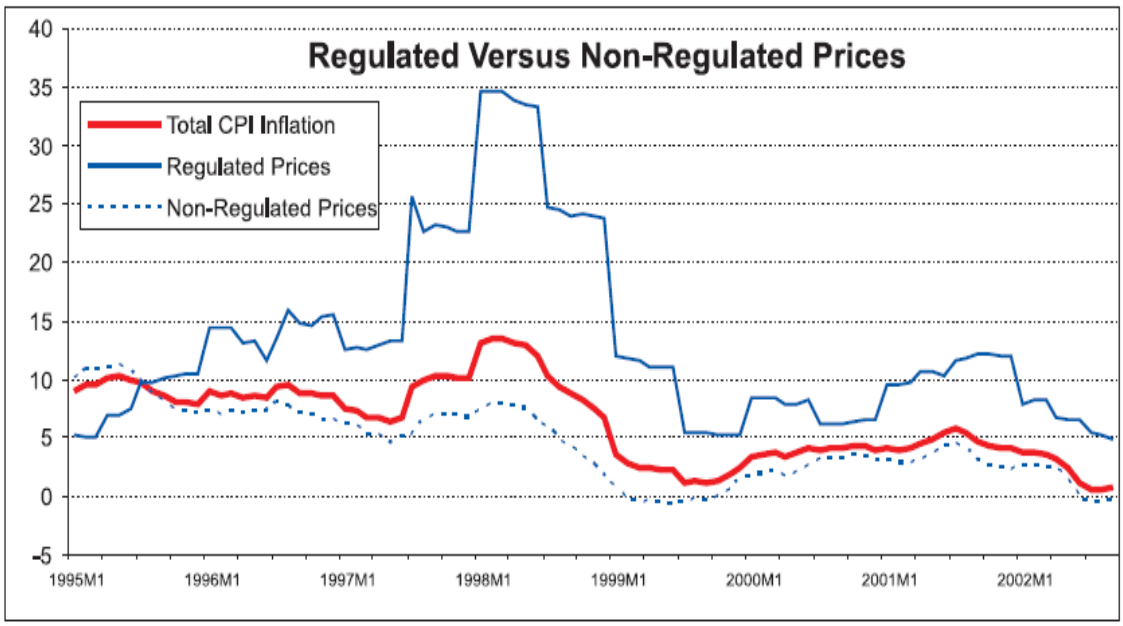
Figure 1: Nominal Exchange Rate Index



Source: Coats et al. (2004)

Figure 17: CPI-Based Measures of Inflation

Figure 2: CPI-Based Measures of Inflation



Source: Coats et al. (2004)

At the time of implementation, full inflation targeting was largely limited to a group of relatively small developed economies. None of the other central and eastern European economies had made the decision to adopt inflation targeting and the other economies that were not so developed – Chile and Israel in particular – were still moving towards price stability and had not completed the process. There was thus therefore no helpful pool of empirical evidence that such a move would have a strong chance of success. The CNB's cautious approach in planning the process out carefully had merit and was a plan that others have since emulated. The CNB has gone from being a recipient of advice to a major provider of advice to aspiring inflation targeters round the world.

The switch to inflation targeting at the beginning of 1998 (announced the month before) was explained as adopting a more effective means not a change in target. The CNB has opted for a straightforward structure for inflation targeting. It has a purely internal decision-making body composed of the Governor, two Vice-Governors and four Chief Executive Directors, formally appointed by the President of the Republic for six-year terms. The objective of price stability is laid down in the Bank Law with support from the constitution. Independence both for the Bank itself and the Board members individually in the exercise of their task is carefully established. This has been challenged and in 2000 a law was passed requiring the Bank to consult with the government of the setting of inflation and exchange rate targets. However, this was ruled unconstitutional and the Bank's independent standing was reinforced in 2002.

The initial target was to reduce inflation, starting with a range of 5.5-6.5% for the end of the first year with a medium-term target of 3.5-5.5% by the end of 2000. However in mid-1999 the horizon was extended with an objective for price stability of inflation between 1% and 3% a year set for the end of 2005. This gave a mid-point of 2% roughly in line with the Eurosystem target. (The CNB writes about both ranges and mid points +/- 1% but the official descriptions refer to a target with a tolerance range.) The CNB assumed that membership of the EU would occur some time between 2003 and 2005 and hence a reduction in inflation of 0.5% a year would result in convergence round about the correct time. In line with many other transition economies the initial target was in terms of a core concept, labelled 'net inflation' so that special factors resulting from the need to bring some areas of regulated prices into the market system did not affect the overall target. By 2001, when these factors had abated, the target was changed to headline inflation, with a consequential change in the range to 2-4% to allow for the difference in forecast inflation between the two concepts. (1-3% has since been reinstated (in March 2007) as the target for the years from the end of 2009 onwards but this time for the headline.)

In deciding on their definition of price stability in mid-1999 the CNB deliberately set aside the argument that the fact that their price level was 45% of that prevailing in the EU entailed a faster rate of inflation to be built in. They argued 'the problem of price levels is a derived one. Relative productivity growth is the determining and primary factor for narrowing the gap in price levels. Processes at the microeconomic and institutional level generate this. Macroeconomic policy cannot set itself the goal of achieving price level convergence. The important thing is to create an environment and introduce mechanisms that will lead to an acceleration of productivity growth; this is exactly what the strategy of price and monetary stability is aimed at and contributes to.' Real exchange rate appreciation was therefore expected with only a small measure of that occurring through differences in the rate of inflation (the Czech headline CPI and the HICP definition for the euro area are similar).

In March 2007, the Czech Republic accepted that early membership of the euro area was unlikely. The inflation target (beginning in 2010) was reduced to approximately the same level as the euro area (2% with a tolerance band of 1% above and below) on the grounds that the special factors that related to a transition economy would have largely disappeared by then. The March 2007 changes also represent the adoption of the leading edge approaches of the Nordic inflation targeting central banks with a forecast driven path for the policy interest rate being announced (as discussed in section 4.2).

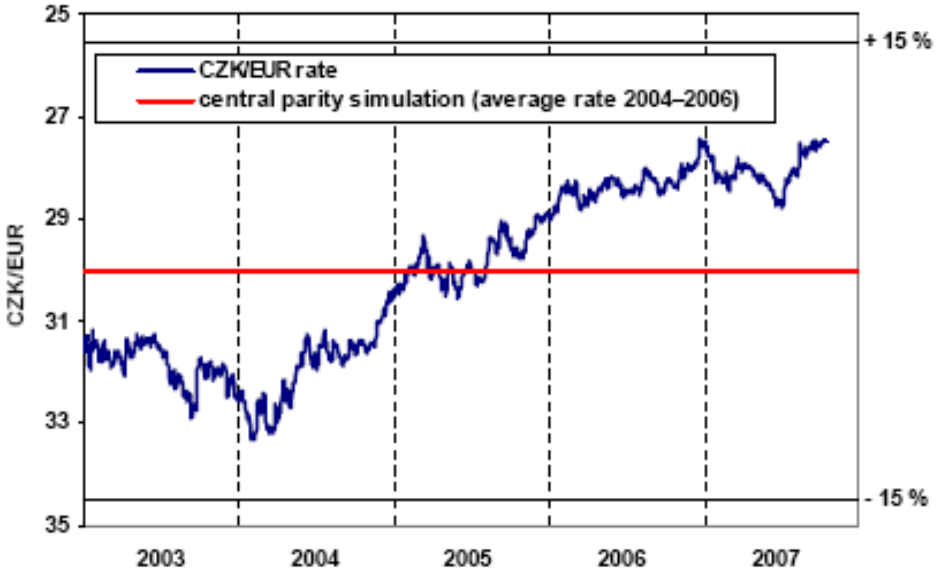
The experience under inflation targeting has not been smooth, as one might expect for a very open and rapidly growing economy. However, unlike the bulk of inflation targeting countries the problem for the CNB has been undershooting the target (Smidkova, 2008). For the majority of the period since inflation targeting started inflation has been below the band and never above it. Indeed until 2005-7 actual inflation was below the target range about twice as often as it was in it. It appears that it is downward shocks that are the major contributor, followed by a tendency to overforecast inflation. Policy-makers on the other hand appear to have taken decisions that were largely in line with the forecasts and the prevailing understanding of how the economy worked. There is some indication of asymmetry in policy in the early years with a more aggressive response to the threat of inflation above target than to the threat of inflation below it. However, such an approach is common where the authorities have not as yet succeeded in bringing inflation expectations firmly down to the target range. The forecasting process evolved. Up until 2001 forecasting was largely based on a series of small models and projections built up by sector experts. Between 2002 and 2004 the forecasts were more driven by a core model, augmented by expert analysis, particularly for the short term outlook, and from 2005 on the augmented model with risk analysis. The sources of undershooting are therefore also evolving but it is clear that in the most recent period, the process of risk analysis appears to have lessened the errors and decision-making in itself has improved on the model-based forecasts.

As a transition country the Czech Republic faced extreme problems of lack of useful data and the absence of any ready ability to estimate how the economy behaved. It therefore adopted a carefully organised modelling approach that explicitly allowed for transition. It was initially based on a fairly straightforward ‘gap’ approach with only a few equations but has grown in complexity so that it now has reached stage of a modern estimated dynamic stochastic general equilibrium (DSGE) model. The CNB has been particularly adept in developing software. It has also developed a careful communications strategy, setting out its forecasting and policy analysis system (Coats et al., 2005). The CNB experience is thus very instructive for three main reasons. It shows that such targeting can be adequate even with limited information. It shows that a transition economy can operate successfully with low levels of inflation despite a large price level gap. It shows that extensive learning is possible. Nevertheless, the success of policy or rather the extent of undershooting was such as to push the limits of political tolerance in 2000, showing that unless the constitutional position of the central bank is sufficiently well enshrined it would be easy for adverse circumstances and the inherent inaccuracy of the process to derail the acceptability of policy aimed at price stability. However, such an experience is not simply a feature of inflation targeting it applies to any monetary policy. The key difference is that with a hard exchange rate peg the political cost to changing the system seems much higher. With inflation targeting, small changes can be made to the target that do not appear particularly costly at the time. Unlike New Zealand where the target, having been achieved, has been ratcheted up, in the Czech Republic the target has been slowly lowered to the Eurosystem (and New Zealand) level.

4.4.3. The Debate about Joining EMU

The Czech Republic prepared a careful assessment of an appropriate strategy for joining the euro in the form of a joint document by the government and the CNB in mid-2003. (Since the Czech Republic has no derogation, it is a matter of how and when, not whether.) Unlike the Baltic States, Slovenia, Slovakia, Malta and Cyprus, who planned to enter EMU and hence ERM2 as soon as possible on entry to the EU, the Czech Republic judged that 2009-10 would provide a suitable entry date and that it would join ERM2 for the minimum time necessary (two years before the assessment) as the flexibility of the exchange rate formed an integral part of the inflation targeting strategy – tending to show a slow nominal appreciation. Halting this might harm price stability.

Figure 18: The CZK/euro exchange rate in recent years



Source: CNB, Ministry of Finance calculations
Notes: In the chart, an upward movement in the exchange rate means an appreciation of the koruna
The hypothetical central parity is simulated by the average rate for 2004-2006.

Source: Smidkova (2008)

The main reason for the measured approach was not due to problems of monetary policy, however, but simply that the budget deficit exceeded the permitted criterion, and would take a number of years to bring firmly into line. Furthermore, the labour market exhibited a number of rigidities and in the absence of reform the authorities were worried that the loss of the interest rate and exchange rate mechanisms for adjustment might result in large real effects in the event of an idiosyncratic shock. The authorities agreed that they would make an annual assessment of progress and whether to enter ERM2 and the 2-3 year run up to entry of the euro area.

As the time for entering ERM2 in line with the 2009-10 deadline approached in 2007 it was clear that a reappraisal was necessary, partly because of adverse shocks to the budget but also because of inflation shocks both from energy prices and an increase in indirect taxes. This took the form of a second joint statement by the government and the CNB in August 2007.[44]

[44] Available at http://www.cnb.cz/m2export/sites/www.cnb.cz/en/monetary_policy/strategic_documents/download/eurostrategy_070829.pdf

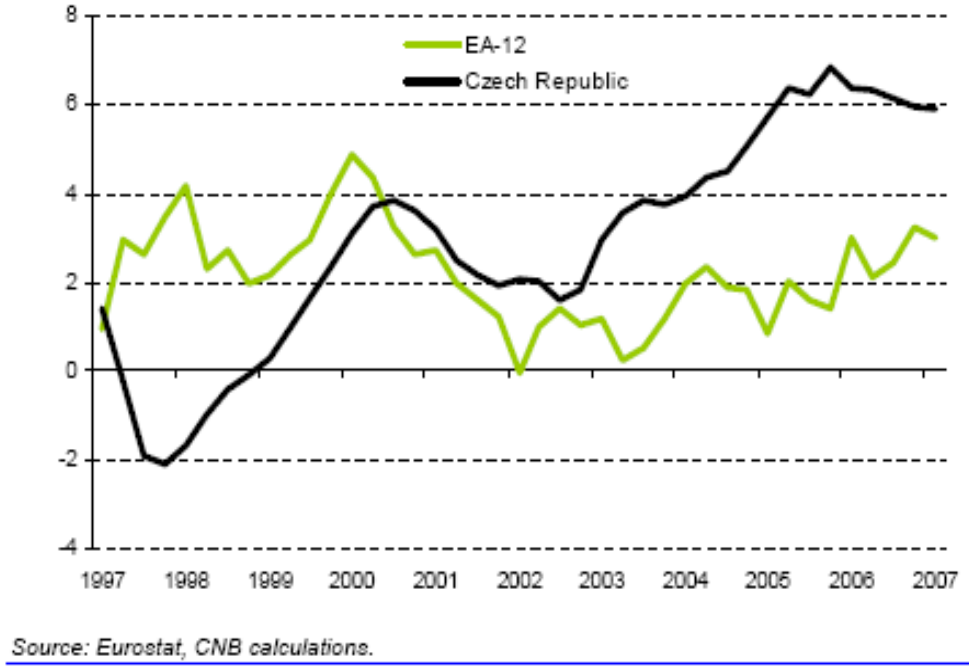
The idea of a target date was abandoned although it was noted that the other Member States who were following a more measured trajectory were talking in terms of 2012-14. The Czech Republic's own fiscal policy consolidation was aiming at a 1% deficit to GDP ratio in 2012, implying that same sort of horizon when taken in conjunction with the programme to increase flexibility in the labour market and remove administrative barriers. However, the fiscal programme was expected to go further than required for meeting the Maastricht deficit criterion and was being pursued on its own merits.

It is noticeable that the joint assessment reads much more like an appraisal of the normal sort of optimal currency area (OCA) criteria than a simple assessment of compliance with the Maastricht criteria. In terms of trade, for example, the Czech Republic is more integrated with the euro area than are many of the existing members. Meeting the Maastricht criteria would involve simply reducing the government deficit as the other criteria were normally met each year (without the exchange rate constraint). Thus implicitly there was a weighting of relative costs and benefits from membership and not just a simple quantitative convergence criterion. Indeed the report makes it clear that the annual assessments could not be that simple.[45]

The report also noted the major difference in nominal price and wage levels (wages were around a third of euro area levels). After euro membership convergence would need to come through increases in nominal wages rather than nominal appreciation, although this does not necessarily imply inflation if such increases are matched by relative productivity improvements. It is noticeable in the first report that the authorities recognised that discrepancies in price levels of as much as 30% could occur between monetary union members for extended periods. This therefore gives indications of two factors that differentiate the Czech Republic from some other new Member States. First, that inflation convergence was not the problem it was in the exchange rate targeting/currency board countries; and second, that nominal convergence was not expected within a foreseeable horizon. Real convergence has progressed well and Czech GDP/head is 70% of the euro area average in PPP terms, above that of Portugal. ERM2 membership remains something that is simply necessary for joining the euro area and not something desired on its own merits.

[45] http://www.cnb.cz/m2export/sites/www.cnb.cz/en/monetary_policy/strategic_documents/download/maastricht_assessment_2007.pdf

Figure 19: Percentage growth in real GDP in the Czech Republic compared with the euro area (12 countries)



Source: Smidkova (2008)

4.4.4. Financial stability

In the course of its short history, the Czech National Bank has been deeply involved in the supervision and reorganisation of the financial system. Not only is the CNB the supervisor but many of the banks have got into difficulty and indeed failed. As a result, there is substantial foreign ownership of the Czech banking system as there was a lack of domestic funds to buy up the assets even at discounted prices. Having foreign-owned banks has not of itself solved the problem. The CNB's takeover of Investicni a Postovni Banka (IPB), at one time the third largest Czech bank, in June 2000 has proved very controversial. Nomura had bought nearly a 40% holding in the bank from the Czech government and subsequently increased its shareholding to 46%. On investigation the CNB found that the bank was holding far less than the required capital and when the owners did not replenish it they stepped in, triggering a string of claims and prosecutions.

The CNB has deliberately separated its financial stability and financial supervisory functions although the information flow remains. This enables stability to be treated as an economy wide issue rather than simply be built up from aggregating the experience with the individual banks. Thus stability is associated with the Economic Research Department on a par with its work on the real and monetary economies. This enables it to have a direct interaction with the modelling experts in the Bank.

4.5. China's Monetary Policy[46]

4.5.1. Introduction

In this section, we analyze monetary policy in the largest emerging economy, China. Chinese economic reforms commenced thirty years ago, also embracing the financial sector. In the following, we describe the objectives of Chinese monetary policy and the framework within which it operates. The focus of our descriptive analysis is on the 1990s and the current decade. As China is undergoing a transition from a command towards a market economy, quantity-based instruments are still prominent in its monetary policy framework. Important role in policy is occupied by money supply – as opposed to interest rates in advanced economies. This is reflected both in the intermediate objectives and policy implementation by the People's Bank of China (PBoC). We analyze how successful the People's Bank has been in attaining its goals. Moreover, we look at the issue of Chinese exchange rate regime and discuss some of the issues arising from the chosen regime. Finally, we discuss recent inflation developments that illustrate how both the implementation of monetary policy and structural factors have been responsible for the movements in consumer prices.

4.5.2. China's monetary policy framework

Before the start of economic reforms in 1978, macroeconomic policy-making rested solely in the hands of the State Council, China's cabinet. While a monobanking system had been previously in place, the State Council decided in September 1983 that the People's Bank of China should assume the functions of a central bank. The central bank status was confirmed legally by the Third Plenum of the Eighth National People's Congress in March 1995.

The PBoC's official objective is to "maintain the stability of the value of the currency and thereby promote economic growth". Importantly, China's central bank is not an independent monetary authority. The PBoC implements monetary policy under the leadership of the State Council. This probably partly explains the fact that in addition to the target of price stability (internal value of the currency), the promotion of economic growth is explicitly mentioned in the central bank's objective. As growth and a favourable employment situation are of primary concern for the Chinese policymakers, a possible inflation bias in the conduct of policy cannot be *a priori* ruled out. Nevertheless, inflation has been mainly held well under control in the reform era. As a large share of the wealth of Chinese economic agents is stored in bank accounts yielding low interest rates, inflationary bursts could quickly erode the savings of the general public.[47] This makes low inflation an important source of both economic and social stability.

The 1990s proved an important decade in terms of Chinese reforms, including those of monetary policy. In 1994, the official and market exchange rates were unified, and current account transactions were liberalized. This brought an end to the previous dual exchange rate regime. The exchange rate system was officially changed to a managed float, although a *de facto* US dollar peg was in place from 1995 to mid-2005. Banking reform included the creation of three policy banks, which separated policy finance from commercially-oriented banking activities.

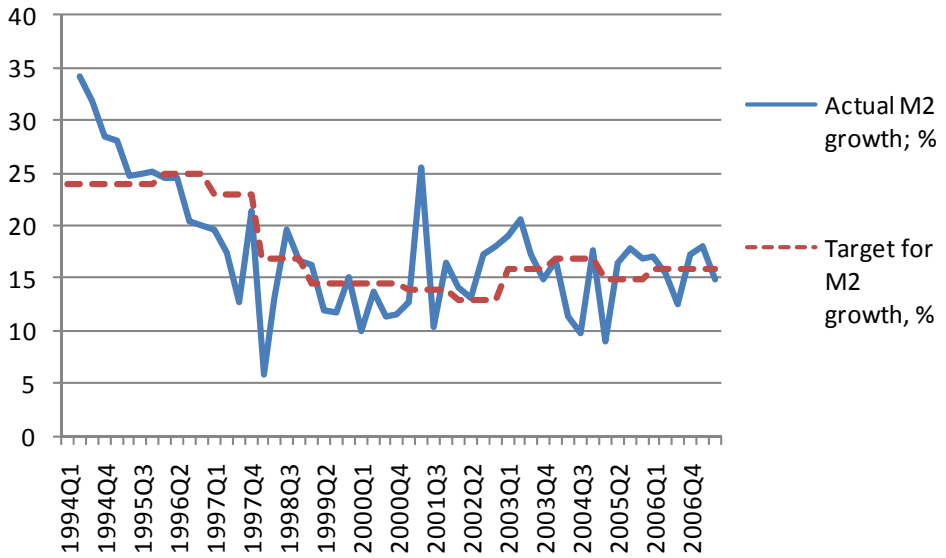
[46] This section was contributed by Dr. Aaron Mehrotra, Bank of Finland, Institute for Economies in Transition (BOFIT).

[47] Indeed, the ratio of broad money to GDP in China is among the highest in the world. In 2007, it amounted to 162%.

In the mid-1990s, the People's Bank started to publish annual intermediate targets for monetary aggregates. To date, targets for the growth of monetary aggregates M1 and M2 have been most prominent. Money supply has occupied a central place in the monetary policy framework. In particular, the PBoC has claimed that an appropriate rate of money growth will promote "economic growth positively and contribute to preventing both inflation and deflation". In this regard, the current framework resembles monetary targeting, and is reminiscent of the policy adopted in several advanced economies in the 1970s.[48] However, according to Geiger (2006), money growth targets in China do not seem to follow straightforwardly from the traditional quantity equation of money. While there is no formal inflation targeting regime in place, targets for annual CPI growth are set among the country's targets for social and economic development. Intermediate targets for growth in broad money M2 – including currency in circulation, demand and savings deposits - have fluctuated between 14 and 17 % during the current decade. While point targets have been more common, the target for 2000 was defined as a range of M2 growth between 14 and 15 percent.

Deviations of actual money growth from the announced target have been reflected in China's inflation development. For example, during the deflation climate of 2000, the midpoint of the M2 growth target range of 14-15 percent was undershot by over two percentage points. Similarly, actual growth in M2 in 2002 exceeded the central bank's target by almost 4 percentage points, after which deflation was over in China. However, in sum, for a developing economy, money growth has not deviated excessively from the pre-announced targets (see Figure 20). Moreover, China has been able to achieve high economic growth – on average 10% annually after the start of economic reforms – without runaway inflation.

Figure 20: M2 growth targets and actual M2 growth



Source: PBoC Annual Bulletin & Quarterly Statistical Bulletin, various issues; Own calculations.

In academic research, China's monetary policy is often modeled by variants of the so-called "McCallum rule" where money supply serves as the central bank's operating target (see e.g. Koivu et al. 2008, and the references therein). This is in contrast to research for advanced economies, where studies usually employ "Taylor-type" interest rate feedback rules.

[48] Monetary targeting was widely considered successful in e.g. Germany and Switzerland.

Some studies find that the McCallum rule would have suggested a more expansionary monetary policy than the one actually pursued in the late 1990s during deflation. Nevertheless, actual money growth has sometimes followed the rule rather closely. In China, interest rates have traditionally occupied a relatively small role in the monetary transmission mechanism. Until 1998, credit plans were in place. These determined the amounts of credit for the banks to extend and also the customers eligible for lending. Therefore, commercial banks' activities were under close guidance of the authorities.

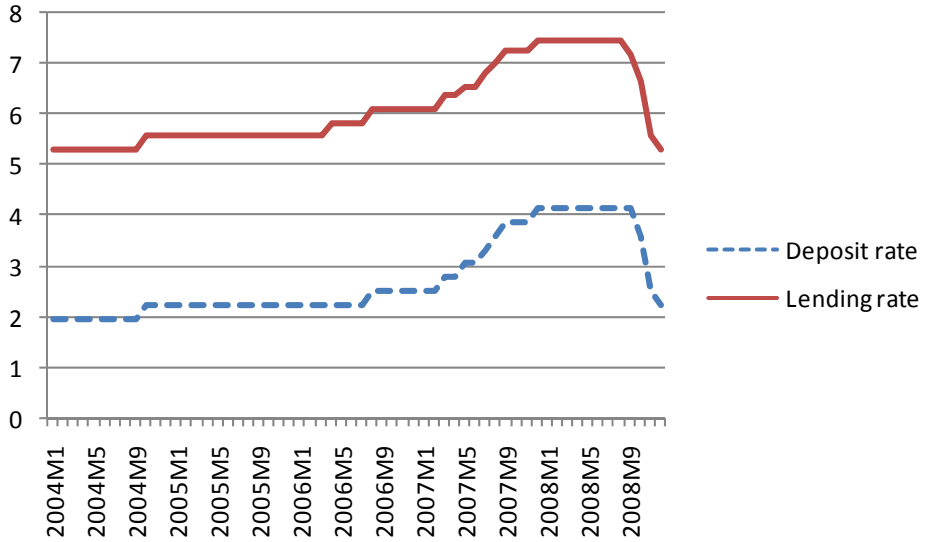
Even today, while credit plans are no longer in place, commercial bank lending focuses on state-owned enterprises (SOEs), leaving private firms and households with a worse access to credit. As budget constraints have often not been binding for the SOEs, price mechanisms have not functioned properly. This has weakened the risk management of China's commercial banks. Moreover, the PBoC's toolbox of instruments still includes "window guidance" which involves strict guidelines from the central bank to the commercial banks on the appropriate amounts of lending. Domestic growth in credit has also served as an intermediate target for monetary policy, although credit targets have not been set every year. As the State remains the majority owner of commercial banks, the profit orientation of the banks has been limited.

Another important policy tool, especially in the authorities' efforts to prevent overheating in 2006 and 2007, has been the adjustment of the reserve requirements of commercial banks with the PBoC. The commercial banks have maintained excess reserves at the PBoC, which could to some extent decrease the effectiveness of monetary policy. However, these excess reserves have declined quite substantially in the recent years and they amounted to under 4% in 2007.

Various reforms have increased the importance of interest rates in China's monetary transmission mechanism. Interest rate liberalization commenced in 1996, after which the fluctuation bands around the central bank-set lending and deposit rates were enlarged. An important step was taken in October 2004, when the lower limit for deposit rates was removed. The lending rates were also allowed to move more freely, with the lower limit set as 0.9 times the central bank's benchmark interest rate. Nevertheless, actual interest rates have not deviated much from the central bank's benchmark interest rate. The PBoC reports that in the second quarter of 2007, the share of floating-rate loans that had interest rates above the benchmark rate was only 44%. In the implementation of policy, the PBoC controls the growth of monetary base by open market operations.

Interest rates as policy tools gained importance in 2006-2008, first to avert possible overheating of the Chinese economy, and afterwards to diminish the impacts of the global financial crisis on China (see figure 21). In autumn 2008, interest rates were cut a total of five times. This included an interest rate cut taking place at the same time with the co-ordinated monetary policy easing by the world's main central banks.

Figure 21: One-year benchmark interest rates



Source: PBoC Quarterly Statistical Bulletin; BOFIT.

Reform is taking place also in the banking sector. Three of China's four big majority state-owned commercial banks, Industrial and Commercial Bank of China, the Bank of China, and China Construction Bank have been stock-listed. Prior to the listing, China used its massive foreign exchange reserves to shore up the banks' capital. All three banks have sold minority stakes to foreign strategic investors, and the foreign investors committed to holding their shares for a minimum of three years. In late 2008 and early 2009, some foreign strategic investors sold off part of their stakes. The only remaining unlisted bank of the "big four" is the Agricultural Bank of China (ABC). However, in autumn 2008 China released information about the amounts of money that would be used to increase the ABC's capital base, and the eventual stock-listing of the bank is also expected to take place in the future.

Prior to 2003, the People's Bank was responsible for both financial supervision and the conduct of monetary policy. The reform of the organizational structure of the State Council, approved by the First Plenum of the Tenth National People's Congress in March 2003, separated the supervisory responsibilities from the PBoC. At that time, the China Banking Regulatory Commission (CBRC) was established to supervise the banking industry.[49] Nevertheless, the amended central bank law of December 2003 mentions the regulation of financial markets (interbank lending and bond markets, foreign exchange and gold markets), together with the prevention and mitigation of financial risks to safeguard financial stability, as the central bank's functions. The People's Bank also has a functional department dedicated to financial stability.

In terms of independence and accountability, the People's Bank must report its decisions concerning the annual money supply, interest rates, exchange rates, and other important issues to the State Council. This is needed for approval before the decisions are carried out. The PBoC must also submit a work report to the Standing Committee of the National People's Congress. This concerns the conduct of monetary policy and the performance of the financial industry.

[49] The China Securities Regulatory Commission (CSRC) and the China Insurance Regulatory Commission (CIRC) are responsible for regulating and supervising the securities and insurance markets, respectively.

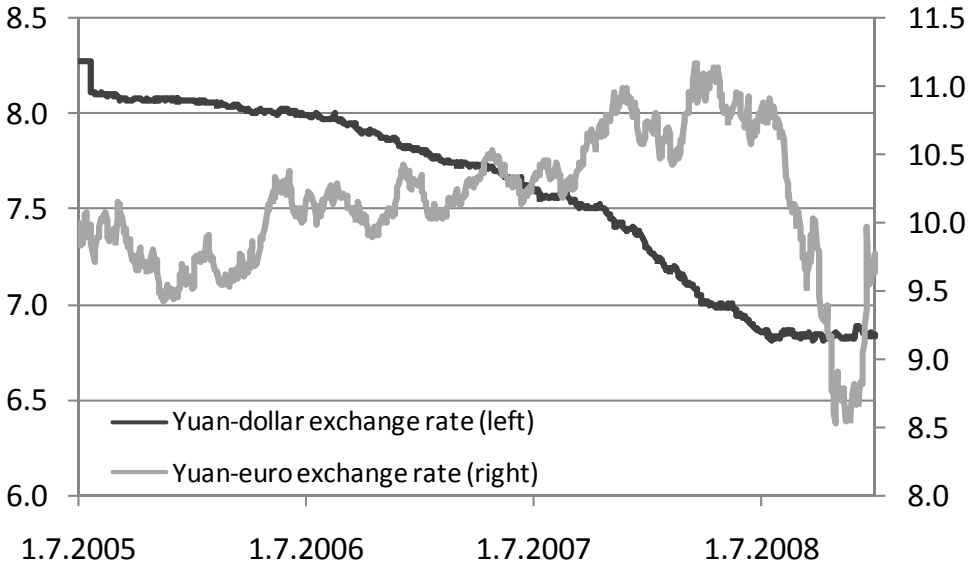
The People's Bank regularly publishes a quarterly monetary policy report, a quarterly statistical bulletin, and an annual report. The quarterly monetary policy report discusses the conduct of monetary policy and financial sector developments, and it also includes macroeconomic analysis. While monetary policy decisions are announced, the announcements are not necessarily followed by any explanation regarding the change in the monetary policy stance.

The President of the People's Republic of China appoints the governor of the People's Bank of China. The candidate is nominated by the Premier of the State Council and approved by the National People's Congress. The deputy governors are appointed into office by the Premier of the State Council. The current governor is Zhou Xiaochuan (since December 2002).

4.5.3. Exchange rate regime

China's monetary policy operates in the framework of limited flexibility in its exchange rate. From 1995 until mid-2005, the yuan was pegged to the US dollar. The dollar peg survived the Asian crisis, which has probably impacted the Chinese authorities' views about the usefulness of exchange rate flexibility until to-date. After substantial outside pressure (mostly from the US) and claims about an undervalued exchange rate, China abandoned the strict dollar peg in July 2005. The authorities announced that the yuan would be pegged to a basket of currencies, with the highest weights occupied by the US dollar, the euro, yen, and the Korean won. Several smaller currencies were also included. Nevertheless, the US dollar has clearly occupied a central place in the currency basket, as the authorities have allowed a gradual appreciation of the yuan against the US dollar. Including the small revaluation of July 2005, the yuan has appreciated by end-2008 by some 20% against the US dollar (see Figure 22). China has announced a limit for a daily change in the yuan's exchange rate against the dollar. At the moment the highest allowed change is +-0.5%, therefore permitting either a daily depreciation or appreciation. The authorities may have also used the exchange rate to maintain domestic price stability, as in the inflationary environment of spring 2008 the yuan appreciated more rapidly against the dollar, allowing for a faster decline in import price growth. As the international financial crisis intensified in autumn 2008, the value of the yuan against the US dollar has largely been stabilized.

Figure 22: Yuan-dollar and yuan-euro exchange rates



Source: Reuters.

The movements in the yuan's exchange rate against the euro have been dominated by movements in the dollar-euro exchange rate. As the dollar appreciated against the euro in 2008, the yuan has seen an appreciation against the euro. The appreciation has been around 10%, which increases the competitiveness of the euro area *vis-à-vis* China in terms of the nominal exchange rate.

Despite the relatively fixed exchange rate regime, capital controls have largely allowed for an independent monetary policy in China. The organization responsible for the controls on capital in China is the State Administration of Foreign Exchange (SAFE), which is under the leadership of the PBoC. SAFE monitors and manages foreign exchange transactions under the capital account. Cross-border flows of money circumventing capital controls – sometimes called "hot money" - have arisen especially on speculation about yuan appreciation. Their amounts have been estimated using the errors and omissions item in the balance of payments. Given that the capital controls can never be perfectly binding and interest rate differentials vis-à-vis rest of the world lead to some in and outflows through the capital account, a more flexible exchange rate regime would benefit the Chinese monetary authorities in terms of improved domestic policy independence. This arises, as interest rate policy could operate without fear of hot money inflows or outflows to the economy.

The current account surpluses of recent years – over 11% of GDP in 2007 – and foreign direct investment have contributed to foreign exchange inflows to the Chinese economy. A significant amount of yuan liquidity is subsequently created when the central bank purchases the foreign exchange from the domestic market in order to keep the yuan-dollar exchange rate at the desired level. Nevertheless, due to majority state ownership in the banking sector, the central bank has had little difficulty in selling bonds through open market operations to commercial banks in order to absorb the excess liquidity (sterilization). In particular, yields on the sterilization bonds have predominantly been lower than those on US government bonds where a large part of foreign exchange reserves have been invested. While the Chinese authorities have not disclosed the currency decomposition of the foreign exchange assets, the weekly newspaper Beijing Review suggested in 2007 that some 70% of the reserves would be in dollars, and 20% in euro.

While direct costs of sterilization have been small, China's exchange rate policy creates implicit costs that are partly borne by the household sector. The commercial banks hold sterilization bonds with low yields, and the household sector obtains only low interest income for its savings in the commercial banks. Due to capital controls, the households are mostly hindered from investing abroad. This lack of investment alternatives has been offered as one explanation for the share price bubble of 2006-2007. On the other hand, China's massive foreign exchange reserves (USD 1.9 trillion in September 2008) provide considerable insurance against financial crises.

The possible undervaluation of the yuan has been the topic of intensive academic and policy debate. Several academic papers have attempted to estimate the misalignment of the yuan from its equilibrium exchange rate. The calculation of an equilibrium exchange rate is difficult, even more so for emerging economies that are undergoing deep structural change. Most studies conclude that the yuan is somewhat undervalued – although the magnitude of the misalignment varies significantly from one study to another – while some find that the yuan is fairly valued or even overvalued.

A fast-growing economy catching up with advanced economies should experience real exchange rate appreciation due to productivity improvements and structural change in line with the Balassa-Samuelson effect. Currency appreciation increases the domestic purchasing power and therefore welfare. If the nominal exchange rate is maintained stable, real exchange adjustment should come through higher domestic inflation.

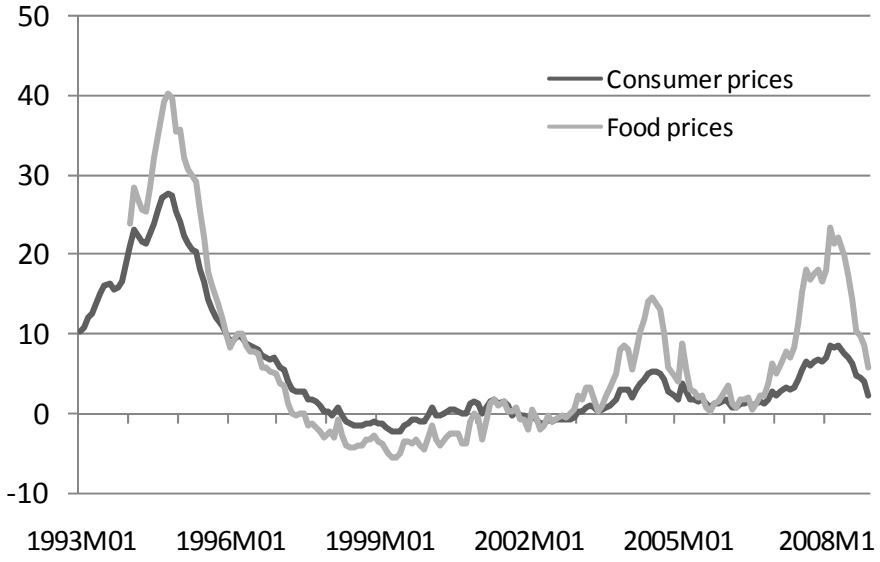
4.5.4. Inflation developments in the 1990s and current decade

Despite arguments about an undervalued exchange rate and the limited policy independence arising from a policy of relatively fixed exchange rates, China has been quite well able to maintain the domestic value of the yuan, i.e. price stability. In this sense, monetary policy has been successful. Asset price increases have been visible, however, including the stock price bubble of 2006-2007 and fast increases in housing prices especially during 2004-2007.

Regarding the determinants of inflation in the short run, academic research has identified a link between the output gap – the difference between actual and potential output – and China's inflation (e.g. Scheibe and Vines, 2005). This is also confirmed by the casual observation that as economic growth exceeded 11% in both 2006 and 2007, cost pressures arose in the Chinese economy. Even if consumer price inflation excluding food prices only increased moderately, wages were rising rapidly.

The analysis of inflation developments from the early 1990s until to-date reveals the role of both monetary policy and structural reforms in the determination of price fluctuations (see Figure 23). In the early 1990s, the Chinese authorities implemented major price reforms to reduce the number of administrated prices in the economy. At the same time, credit growth was rapid, associated with high levels of investment by the SOEs. Strong demand pressures in the economy drove inflation to over 25% in 1994. The authorities reacted by implementing tight monetary policy in order to drive down inflation. This included higher interest rates and strict controls on lending.

Figure 23: Consumer price and food price inflation (year-on-year growth rates)



Source: National Bureau of Statistics; CEIC database.

Inflation retreated slowly and eventually turned to deflation in the late 1990s at the time of the Asian crisis. Reasons for deflation included positive supply-side developments, such as productivity increases and WTO-related tariff cuts. But monetary and especially exchange rate policy also played a role; as the yuan was tightly pegged to the US dollar, the trade-weighted exchange rate appreciated together with the US dollar, putting downward pressure on import prices.

Inflation remained low until 2004, when food price increases, especially higher prices of grain, put upward pressure on prices. While inflation is ultimately a monetary phenomenon in the long run, food prices continue to exert important short-run influence in Chinese consumer price developments, as they carry a weight of one third in the consumer price index. Inflation increased again in late 2006, mainly due to increases in the price of pork. The latest inflation peak was experienced in February 2008, when CPI inflation was close to 9% year-on-year. The Chinese authorities reacted to price pressures with tighter monetary policy, but also by increasing incentives for farmers to increase food production and by direct guidelines for pricing. These measures, coupled with a favourable harvest, have helped in driving down CPI inflation to close to 2% year-on-year by November 2008.

4.5.5. Future outlook

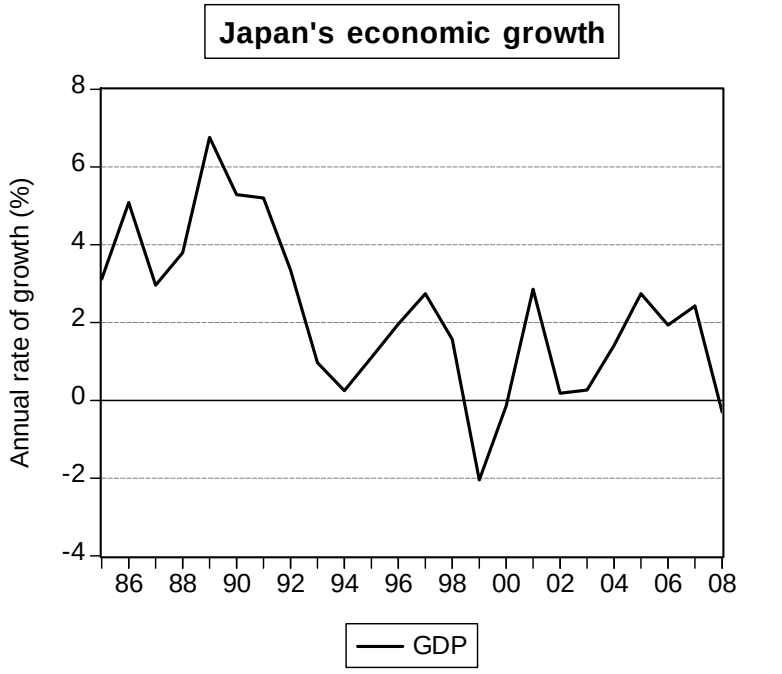
The Chinese monetary policy framework faces challenges, as it gradually moves towards more flexibility in the exchange rate. As capital controls are slowly being dismantled, the possibility to conduct independent monetary policy would weaken considerably if exchange rates were to remain fixed. The increasing profit-orientation of the commercial banks and the growing role of foreign banks in the financial system contribute to promoting the importance of interest rates in the transmission mechanism. Given the mounting role of the private sector in the Chinese economy, price-based measures will gain importance over quantity-based policies in the implementation of policy and in determining its impact on the real economy.

4.6. Easy money policy of the Bank of Japan

The case of Japan provides several helpful pointers as to what to do in the face of deflation and the zero bound for the nominal rate of interest that may unfortunately prove useful as the current crisis evolves. However, the experience also provides pointers over what not to do as most commentators consider that the problems were protracted far longer than necessary and as a result were far more costly than necessary.

The downturn started in Japan in the middle of 1991 (see Figure 24) when land prices started to fall away after their meteoric rise that had started in 1985. The stock market moved and peaked earlier, 1983 to end 1989, but the economy did not start to slow until 1991. Both asset prices quadrupled in the boom. However, while land prices declined very rapidly for 5 years and then continued to decline more slowly to below their starting values, stock market behaved differently, with a 60% decline by 1992, then a period of volatility for 8 years before a second decline at the time of the bursting of the dotcom bubble in the US. Falls of that order of magnitude would place a major burden on even modestly leveraged enterprises and households.

Figure 24

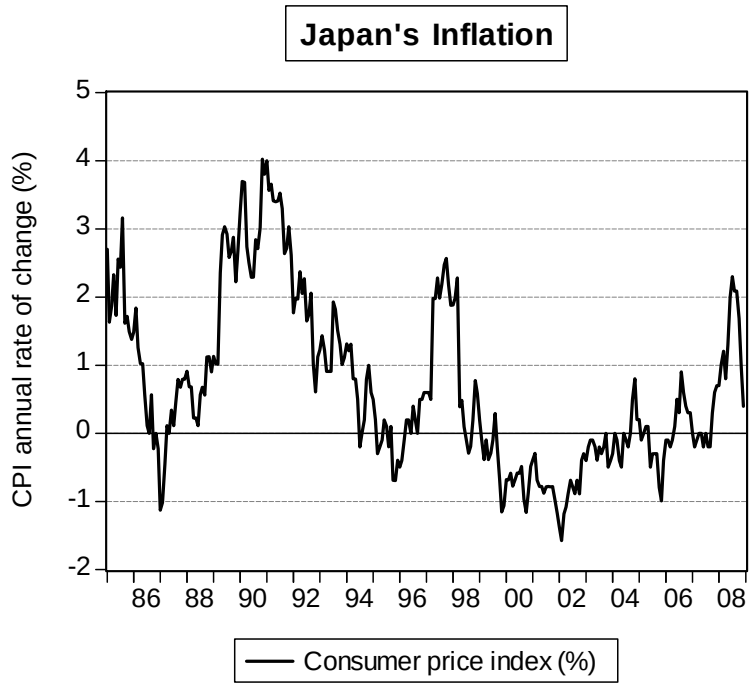


Source: 1985-2007, OECD (Bdsice database). 2008, The Economist.

The economy slowed rapidly but growth over the period 1992-4 was 1% a year and from 1995 to early 1997 growth increased to over 3%. However, at that point there was a second collapse and by 1998 the economy was contracting. There was some recovery in 2000 but the economy remained sluggish with growth only slowly picking up in 2003. There was a steady improvement from then until 2007 but by 2008 the economy was in recession again. Thus two decades after the original collapse in asset prices the economy has not really got back to sustained growth.

Accompanying this poor economic performance has been a slow decrease in the price level (see Figure 25). Inflation was briefly negative in 1995 but from 1998 until 2003 the price level fell slowly by 3% after which prices were stable through to late 2007 and it is only in 2008 that inflation started to reach levels typical of other OECD economies. In the last few months inflation has again died away. However, Broda and Weinstein (2007) argue that the actual deflation problem in Japan is much larger because the computation of the price index is deficient and implies an overestimate of the rate of inflation by as much as 1% a year compared to the United States. Since US inflation is itself thought to be biased upwards by around 1% the limited measured deflation in Japan may reflect a decline in a properly measured price level in excess of 20%.

Figure 25



Source: Statistics Bureau (Bdsice database).

Matching these developments in the real economy and prices, monetary policy was eased steadily until the rate reached 0.5% in 1996. Although it was not fully zero until the period from mid-1999 through to mid-2006, it was effectively at the zero bound as the Bank of Japan was at the limit of its actions. At the end of 2008 the interest rate again effectively returned to zero. However, in the second half of 2001 the Bank began a policy of 'quantitative easing' which sought to increase the liquidity taken up by the banks despite the zero interest rate. These injections increased up to the beginning of 2004 and continued until 2006.

The experience at the zero bound and the period of quantitative easing in particular give a unique experience that provides helpful insights now that the Federal Reserve has also reached the zero bound and other countries may attain the same position if the crisis worsens. However, the Bank of Japan's approach to policy has in part been criticised for the reaching of the zero bound in the first place (Ito and Mishkin, 2004 for example).

Japan has also been criticised for not taking other measures, particularly for not seeking to depreciate the exchange rate or tackle the problem of hidden losses, particularly among the banks. Thus better monetary policy alone is not likely to be the solution to avoiding or swiftly exiting from the zero bound but it could contribute to it.

4.6.1. The monetary constitution of the Bank of Japan

Up until 1998 the Bank of Japan (BoJ) operated with a very general mandate of maximizing economic potential and the Governor could be replaced by the Minister of Finance. The practice had however become rather different and the BoJ ran a fairly independent and conservative though somewhat opaque anti-inflationary policy successfully. Thus it was under this framework that the initial treatment of the crisis took place.

In 1998 a new BoJ Law was implemented giving the BoJ clear operational independence and protection for the Policy Board members from capricious dismissal. The Board has 9 members: the Governor, the two Deputies and six experts. The 1998 Law has price stability as the target, contributing to the sound development of the national economy. Since that date the BoJ has exercised its independence. Indeed it was criticised by Ito and Mishkin (2004) for not working more closely with the government in 2000 when it decided to raise interest rates.

Although the BoJ has participated much more fully in central bank discussions in recent years and has developed its modelling and forecasting and policy assessment strategies in line with modern practice, it has not formulated clear objectives and has therefore had problems with transparency. Ito and Mishkin argue that the timing of independence might have been unfortunate as a vigorous easing policy was required just at the time the BoJ felt it needed to act carefully in exercising its new powers. Normally independence is associated with tougher policies as it is in part a reaction to an unduly inflationary regime. In this case there was no such problem but clearly the new regime had worries about getting a reputation for being lax over inflation before it had even got to a period when its resolve would be tested.

When the quantitative easing policy, described below, was ended in March 2006 the BoJ also announced its understanding of the definition of price stability – inflation in the CPI (excluding food) between 0 and 2% year on year, making it look like a relatively conventional inflation targeter. In October 2000, after commissioning a six-month study the policy board decided against having any numerical target and the conditions under which the zero interest rate policy and the quantitative easing were to end were a little vague, implying that deflation needed to be clearly at an end.

There is a record kept of the policy board meetings, focusing on what was decided and why. There is an opportunity for members to express dissent. Detailed minutes are published with a six week lag and the Governor gives a press conference after the decisions. Gubernatorial styles appear to matter and Hayami who was appointed in 1998 appears to have been less open than his successor Fukui, who took over in 2003, and communicated in a clearer manner (Ito, 2005).

4.6.2. The conundrum of Japanese deflation

With the benefit of hindsight the BoJ should have acted earlier as inflationary pressures increased and eased earlier as asset prices collapsed. It is difficult to establish the inflation forecasts available at the time for policy-makers who wished to be forward-looking. Okina and Shiratsuka (2004) suggest that if only a standard Taylor Rule has been applied using current values, policy would have been noticeably tighter in the years leading up to the asset price collapse (the same finding was made by Bernanke and Gertler (1999)).

Quite how that would have affected expectations, confidence and the asset price build up is difficult to say but the chances are that it would not have lasted so long or gone up so far. Bernanke and Gertler also argue that the decline in interest rates was too slow but Okina and Shiratsuka do not agree.

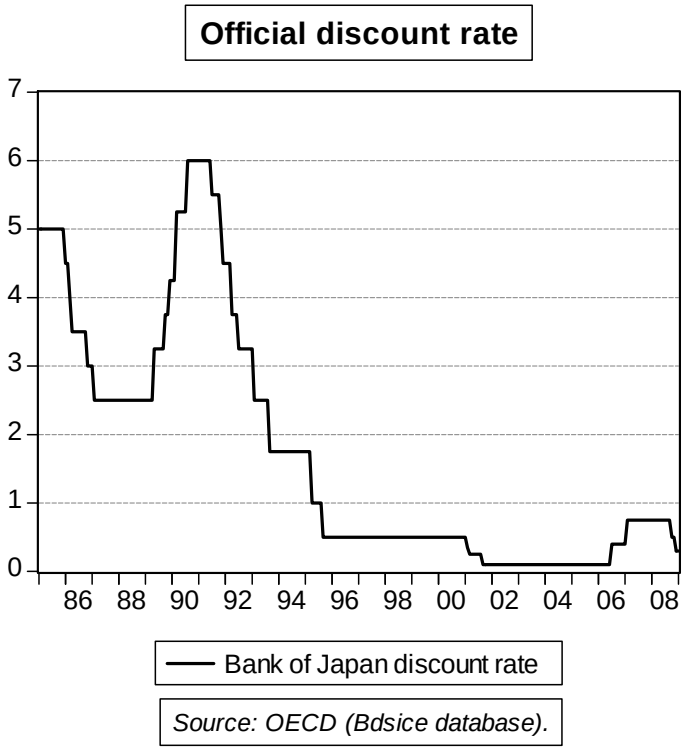
However, this use of a Taylor Rule ignores any information from asset prices and is simply based on inflation and the output gap. As Ito and Mishkin (2004) point out there is some difficulty in deciding what the target rate of inflation was over this period as there was no explicit value stated. Picking the average may not be a good indicator as the implicit target could have been time varying. It is also rather difficult to argue that the simple rule should be followed when the lower bound approaches or is reached. The appropriate policy when people fear that the central bank is likely to incur problems suggests a more vigorous response than usual (Evans et al., 2008). Since people are acting in a region outside their experience, they have to learn how the central bank is likely to respond. The actions therefore have to be clearly different (Kuttner and Posen, 2004). Clearly if asset prices themselves were to be taken into account policy would have required tightening and then easing considerably earlier.

The BoJ not only had some reticence in getting to the zero bound but having done so was keen to get away from it. In August 2000 it raised interest rates at the first sign of a recovery and hence may well have contributed to arresting it. Since the BoJ had no inflation target it was not able to convey readily how much of a stimulus was required. Moreover inflation targets bear no regard to past failures. There are hence arguments that the BoJ should have followed something like a price level target, making it clear that the longer deflation persisted the softer would be the subsequent response, thereby encouraging consumption while prices were low and encouraging the turnaround. It was clear that Japanese consumers would respond to price incentives as a promise of a consumption tax rise in 1997 did indeed act as a stimulus. Clearly such one-off measures need to be amplified by other actions but introducing tightening measures before the demand recovery is well under way is likely to be counterproductive.

4.6.3. The Quantitative Easing Policy

It was only after the second time the BoJ reached the zero bound in 2001, after the 2000 recovery evaporated, that it moved towards the less conventional measures that academics and others had been advocating. Rather than trying to depreciate or operate further out down the yield curve the BoJ decided to push the banks into increasing the reserves they held at the BoJ (known as current balances) (Nakaso, 2007). The initial aim was to increase current balances by ¥ 5 trillion in March 2001, rising in 9 steps to ¥ 30-35 trillion in January 2004. Although such balances were effectively unremunerated the banks were willing to bid for them. There has been underbidding but it was only during the first half of 2002 that this reached significant proportions. Effectively this is just a large Open Market Operation (OMO). These were offered at slowly increasing maturity as the size of the operations increased, starting with an average of around 2 months in March 2001 and reaching an average of around 6 months by mid-2005.

Figure 26



In the early part of the crisis many of the banks had funding problems but steadily cleaned up their balance sheets. However it was not until fairly late in 2003 that spreads had returned to more normal levels. OMOs provide an opportunity to obtain cheap funds that can be lent on as not all interest rates were zero. It is therefore unlikely that the quantitative easing policy could have been followed much earlier.

Quantitative easing ended in March 2006 and the operations became progressively smaller.

4.6.4. What is the problem?

One of the reasons for the Bank of Japan's reticence in using monetary policy to try to solve the deflation problem was that they did not see that the activities that monetary policy could affect as being the source of the problem. In the early stages of the crisis there was a need to recognise the losses particularly in the banking system and then recapitalise the banks. This would have both helped to return confidence and enabled the banks to begin lending again. The process of amalgamations to some extent merely created large weak banks to replace the smaller ones. Later on the BoJ argued that what was required was restructuring – the inefficient needed to be allowed to go out of business so that the dynamic could prosper.

It is not clear whether the quantitative easing actually contributed much to the ending of deflation. It did not expand the wider monetary aggregates (see Figure 27). If the intention is to mop back the excess once the period of difficulty is passed, it is not quite clear what effect this will have on expectations. If some of the increase is to be left to encourage inflation then there may be a reaction.

Figure 27

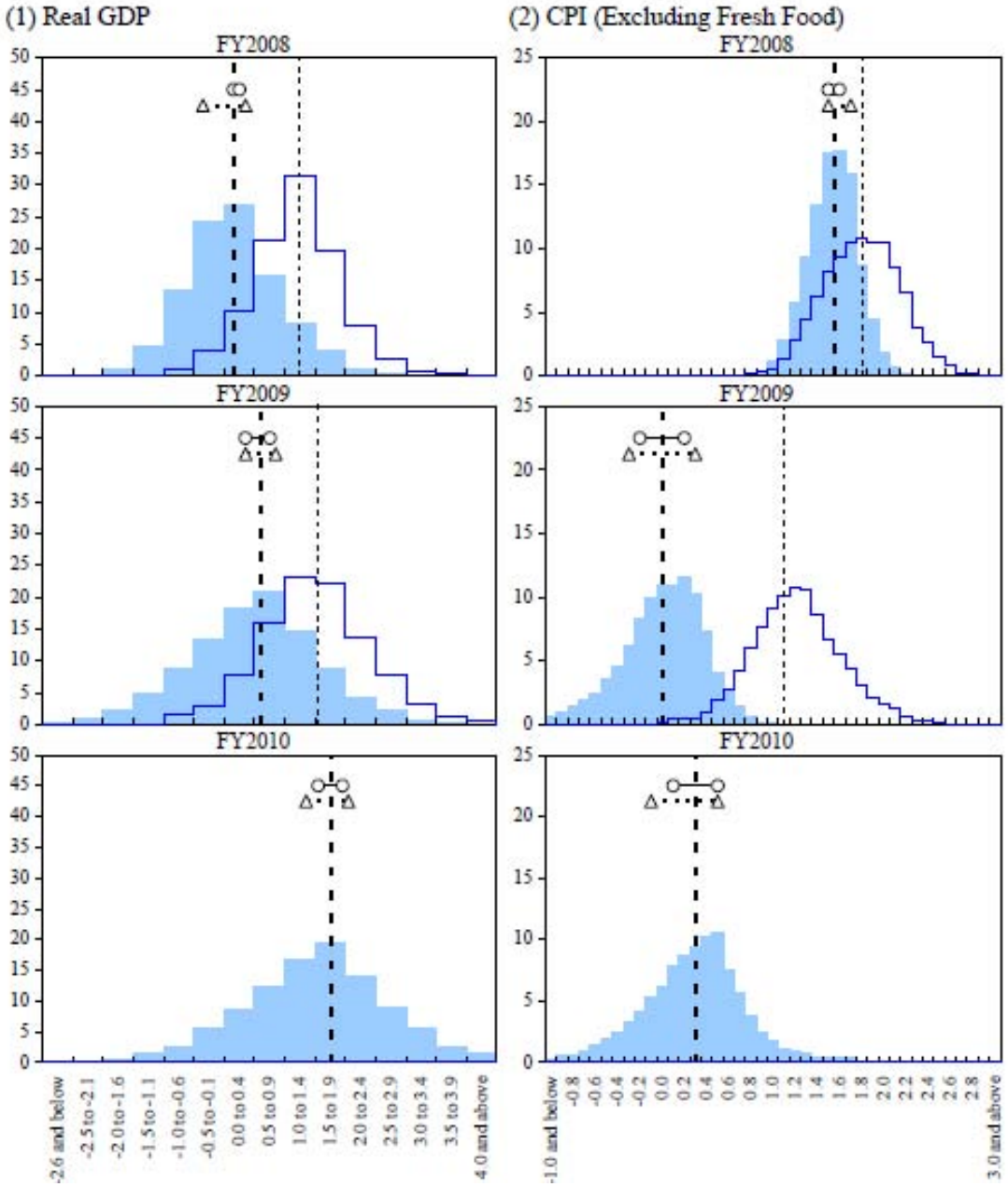
Source: OECD (Bdsice database).

There is some debate about the possible success of alternatives. Operating in much longer dated securities might help in a version of 'Operation Twist' (Bernanke, 2002). The public sector can also buy private sector assets, whether securities or property portfolios. Rather than the idea of bailing out individual institutions by effectively partially or completely nationalising them, it may be more suitable to buy broad spectra of assets as is often practised by sovereign wealth funds. (There is a debate in New Zealand at present about whether their small sovereign wealth fund should expand into more focused purchasing to assist the recovery.) More successful might be the ideas of Svensson (2003) and others. Finally, currency depreciation not only contributes to assisting foreign demand but it may help to increase inflationary expectations.

4.6.5. Financial supervision

The Bank of Japan is not the financial supervisor but unlike most central banks, the BoJ does have powers of oversight and on-site inspections. These are a condition of having access to the BoJ's facilities and since this is treated as part of the borrower-lender relationship, it has not required any particular legislative backing. It does however mean that the BoJ is very well informed about the condition of banks and hence in the course of the crisis years in the 1990s was able to advise and pressure banks into reorganisations that limited the extent of failures and kept the system operating. This clearly blurs the role of lender of last resort to some extent but it enabled some Japanese banks to continue operating and recover, whereas in some other countries they would have failed.

Figure 28
Risk Balance Charts



Notes: 1. Vertical axes in the charts represent probability (%), while horizontal axes represent the year-on-year percentage changes in the respective indicators. Bar charts represent the probability distributions in October 2008, and solid lines represent those in July 2008.

2. Vertical dashed heavy lines indicate the median of the Policy Board members' forecasts (point estimates). ○——○ indicates the range of the forecasts of the majority of Policy Board members. △- - - -△ indicates the range of the forecasts of all Policy Board members.

3. Vertical dashed thin lines indicate the median of the Policy Board members' forecasts (point estimates) in July 2008.

4. For the process of compilation of the Risk Balance Charts, see the box on page 9 of the April 2008 *Outlook for Economic Activity and Prices.*

Source: Output for Economic Activity and Prices. October 2008. Bank of Japan

4.7. Inflation targeting in the UK

4.7.1. A brief history of inflation targeting in the UK

Inflation targeting is generally supposed to have come overnight to the UK, with the election of a Labour Government in 1997. When the Bank of England Act of 1997 was passed and implemented, the Bank of England became an "independent" central bank. It was independent in the sense that it could vary its policy instrument as it wished to achieve the target which had been set by the government. The target is a particular level of a particular measure of inflation. Both the level and the measure are chosen by the government. The outcome is supposed to approximate to price stability. There is much that is contentious about that; these contentious points are touched on below, as are the other, subsidiary, objectives of policy and whether it is sensible to have them. In this opening discussion the aim is to explain why it is maybe a mistake to view that move to inflation targeting as a sudden change in policy, introduced by a new government keen to establish a reputation for economic responsibility. Indeed, a historian could readily argue, in a counterfactual fashion, that a very similar change would have come about whichever party had won the election of 1997. The granting of independence was evolution not change, and is better understood when thus interpreted.

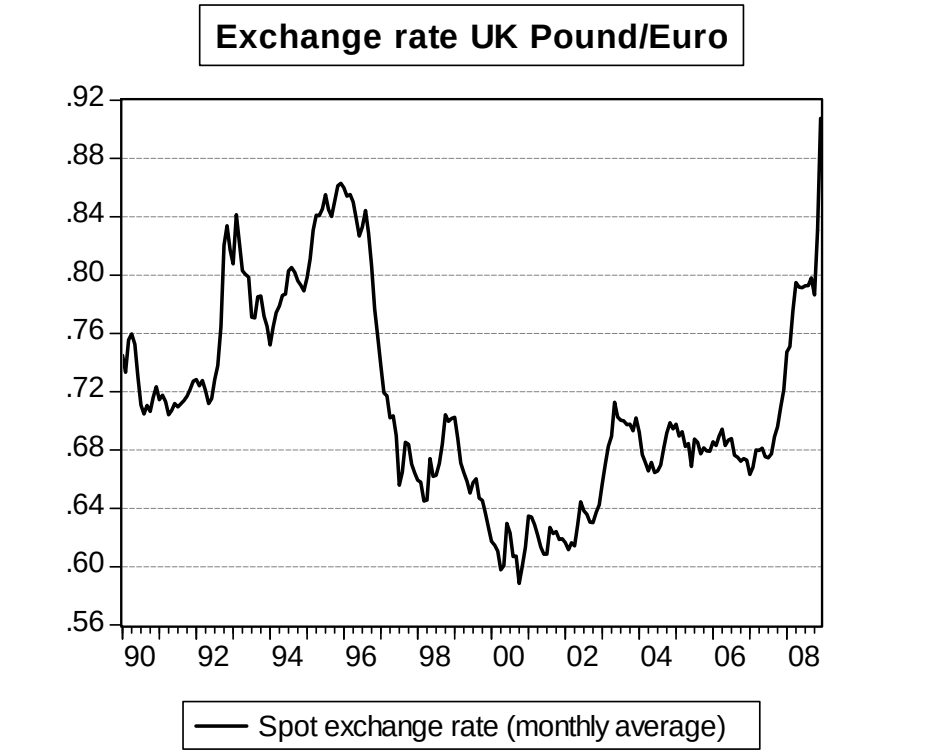
Ever since the floating of Sterling at the end of Bretton Woods, an anchor had been sought to stop Britain being an inflation prone country. When Mrs. Thatcher's first Government took office in 1979, one of its first steps was to announce a "Medium Term Financial Strategy". One of the key parts of this strategy was a target for the growth of a particular measure of the money supply. The measure chosen was Sterling M3. This measure could be easily identified in the balance sheet of the banking sector, and had readily calculable counterparts in government borrowing. It thus linked back to targets and constraints that had been imposed on previous British governments by the IMF. It was evolution not revolution. That monetary measure also was well correlated with inflation in the past. Indeed, it seemed a good indicator of inflation when tested on almost a hundred years of data. (Griffiths and Wood, 1991) Its adoption was a commitment mechanism and a signal of the future course of policy.

Unfortunately the relationship broke down when put to the practical test. Inflation fell and the economy slowed drastically as the money supply (on that measure) rose rapidly. The target was abandoned and other ways of guiding and committing policy sought. But inflation accelerated again, and eventually the British government gave up hope and decided to import Britain's monetary policy from Germany, just as, for the same reason, British citizens imported motor cars from Germany. The performance was better. Britain joined the ERM. (This move also of course was a step towards closer European integration – the grounds on which some had resisted it.)

Britain was evicted from the ERM in 1992, when interest rates in Germany, the core country of the system, were raised at a time when it was clearly both economically inappropriate and politically close to impossible for rates to go up in Britain. A new anchor for policy had to be found. This was the start of the evolution which led Britain to the inflation targeting independent central bank that it has today.

The course was thus from a pegged exchange rate to floating without a clear nominal anchor (in which period inflation reached, in August 1975, 27% pa) to targeting the money supply to judgement to "shadowing" the DM and then back to pegged rates which in turn Britain again had to give up.

Figure 29



Source: Data from the Bank of England website
BoE note: "Prior to 1999, a synthetic euro exchange rate has been calculated by geometrically weighting the bilateral exchange rates of the (then) eleven euro area countries using "internal weights" based on the country shares of extra euro-area trade."

After that, monetary policy started to be conducted in a more open fashion, first under Norman (now Lord) Lamont as Chancellor, and then under his successor Kenneth Clarke. An inflation target was introduced in October 1992. There were pre-announced interest rate setting meetings between the Governor of the Bank and the Chancellor; the minutes of these meetings were first published in April 1994. The Bank of England started to publish, in 1993 (the first issue was in February of that year), when Norman Lamont was still Chancellor, an "Inflation Report" in which it discussed the outlook for inflation. These two events in combination surely doomed the system, and would have led to the transfer of decision making to the Bank regardless of the outcome of the 1997 election. For the Bank was publicly commenting on monetary policy decisions in which it had the role of adviser, while it was the Chancellor of the Exchequer who took the decision. Either the Bank could never dissent or the Chancellor could never count on getting his way. Change was inevitable.

Nevertheless when change came it was a surprise. This was no doubt due in part to the Conservative Chancellor (Kenneth Clarke) stoutly maintaining that such an important policy decision as setting the interest rate had in a democracy to be taken by an elected politician, while the opposition Shadow Chancellor, Gordon Brown, gave a speech (in February 1997) in which he said that the Bank was not yet ready for "operational independence". That, he said, had to be preceded by internal reform at the Bank, and a period during which the Bank would "… demonstrate a successful track record in its advice and build greater public credibility." How that could have been done under the existing system is not clear, but that soon became irrelevant when the Labour party won the election on Thursday, 1 May 1997, for it was less than a week later, on the subsequent Tuesday, that the new Chancellor announced a quarter point increase in base rate and at the same time announced that the bank would henceforward have freedom to set interest rates so as to achieve a publicly announced inflation target.

There was at this time no discussion, at any rate in the UK, of whether Britain should join the Euro. Neither political party displayed any great enthusiasm for doing so, and it had not been even a minor issue in the General Election which had brought the Labour Party to office. This is worth remarking in the context of the granting of "independence" to the central bank, as it was as part of the process of joining the Euro that some central banks – the Bank of Spain, for example – had been given independence.

4.7.2. Elements of inflation targeting in the UK

The new framework has interest rate decisions taken by a committee (the Monetary Policy Committee, henceforth MPC) to achieve an inflation target set by the Government. The Committee has nine members; the Governor of the Bank and the two deputies, two other executive directors, and four "outsiders" whose sole policy task is the interest rate decision and who have no other occupation within the Bank. The committee meets every month, and its minutes are published the second Wednesday after the meeting, along with the votes of the individual committee members. The minutes are detailed, with extensive exposition of the arguments deployed, but the arguments are not identified with individual members. The minutes also include a summary of the information presented to the MPC by the Bank's staff. All rate decisions, including no change, are announced at noon on the day the two-day committee meeting finishes. The dates of the meetings are announced each September for the year ahead, and the Inflation Report gives forecasts for inflation and output, and key underlying assumptions such as the path of the exchange rate.

The Governor must send an open letter to the Chancellor if inflation is more than 1 percentage point above or below target. This letter explains why the deviation has occurred, what is going to be done about it, and when it is expected to return to the target range. In 1997 Mervyn King (not then Governor) observed that "…one of the main purposes of the open letter is to explain why, in some circumstances, it would be wrong to try to bring inflation back to target too quickly." The Treasury Committee of the House of Commons (a subcommittee of the House of Commons) invites the Governor to appear before it after the publication of every inflation report, and can ask him to attend should he have to write to the Chancellor, so that he can further explain the deviation from target and his intentions for getting back to it.

The *Inflation Report* is published quarterly, in an extension of the pre-independence system. It is produced by the Bank staff under the guidance of the MPC. The forecasts of inflation and growth represent the committee's collective best judgement, not the judgement of the Bank staff.

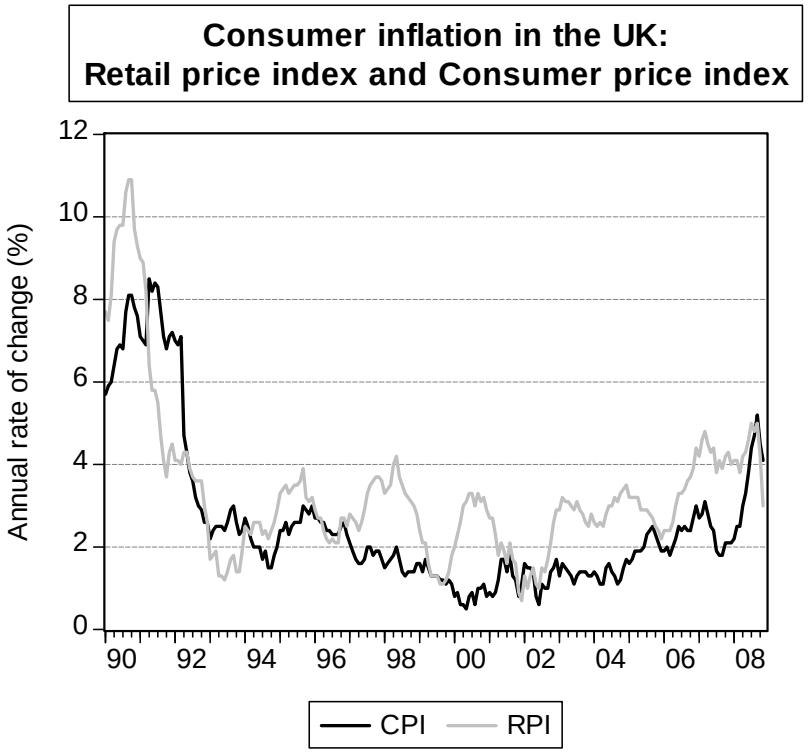
There have been criticisms of this structure. They are in three groups – the nature of the appointments, some detailed reflections by Francis Maude when he was Shadow Chancellor, and discussion of the role of the outsiders on the MPC. There were some early complaints that the committee was "unrepresentative" of industry and of different regions of the UK. It was soon recognised that was an irrelevance, in view of the objective of the committee. Francis Maude raised some, somewhat contradictory, questions over the committee's independence and accountability; but he took the continued existence of the Committee as given, as has all subsequent discussion. As for the outsiders, the puzzle over their role can be seen best by comparing the MPC with the FOMC of the Federal Reserve. The latter also comprises two groups – the Board of Governors and the Presidents of the Regional Reserve Banks. Every one of the latter has his or her own research staff at their own home bank, and each comes for a different region of the USA. It is clear what they contribute, at least in principle, that they could not contribute if based in Washington. What do the MPC outsiders contribute by virtue of being outsiders? This is not so clear, especially as individual votes are recorded and individuals have to defend their own decisions, so scope for "bank groupthink" is not great.

4.7.3. Final target

What is the objective the Committee has to achieve? The target was initially defined as inflation as measured by the Retail Prices Index (RPI). This is a broadly based and long established measure of retail prices, and includes a measure of housing costs. This was replaced by the then Chancellor (Gordon Brown) by what is known as the CPI – the British name for the EU's Harmonised Index of Consumer Prices. The two will almost inevitably differ because of both method of calculation (arithmetic v. geometric mean) and coverage. This new measure attracted much criticism because of its exclusion of housing costs, but whether these criticisms will continue is yet to be seen[50]. It has also been the case that price expectations surveys, and indeed estimates from consumer surveys of what people think inflation is, have exceeded the actual index values quite persistently. This may be due to the recent experience of frequently bought goods (especially food) rising sharply in price, while prices of many consumer durables, less frequently bought, have been falling. A judgment of the efficiency of the MPC must take into account that it has to achieve the inflation target with consideration to the behaviour of the real economy; this has been interpreted as not continually striving to keep inflation at target, and not responding aggressively to deviations from target.

[50] A complicating factor here is that the RPI seems likely to drop below the CPI in the early spring of 2009. Thus criticisms that switching to the CPI was a covert easing may be muted; although it will remain true that on average the RPI must by construction exceed the CPI.

Figure 30



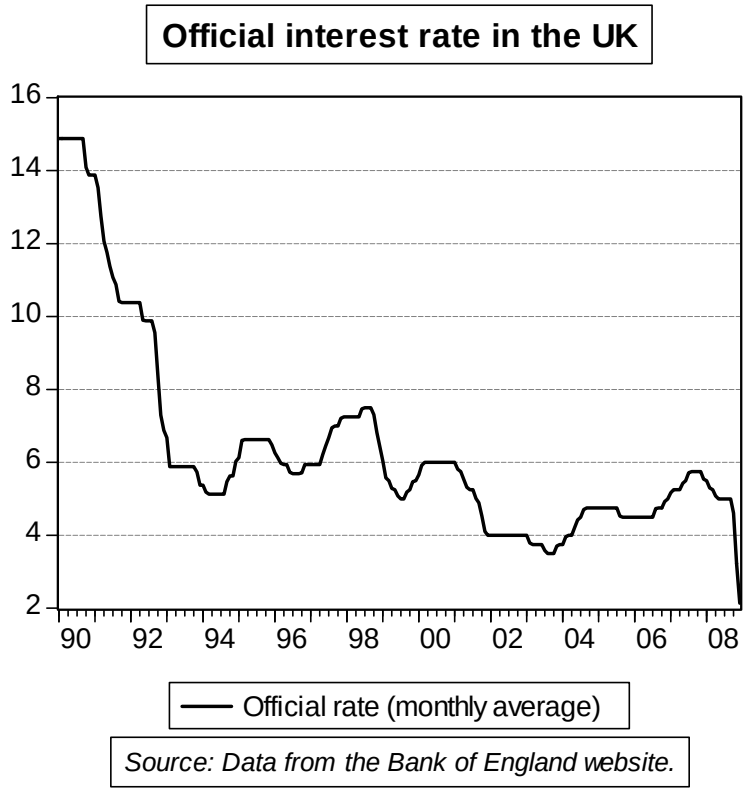
Source: Data from the National Statistics website.

4.7.4. Instrumental variable

To achieve its objective, the committee sets a short term interest rate. How is this decision made effective? It sets "base rate". This is the rate at which the Bank supplies reserves to the banking sector. Banks can decide the amount of reserves they want at this rate. They make this decision every "reserve maintenance period"; these periods run from one meeting of the MPC to the next, so approximately one month. Banks can also borrow as much as they want (against collateral) through a "standing facility", at 1 percentage point above base rate, and deposit at the Bank any reserves they do not need at a rate 1 percentage point below base rate.

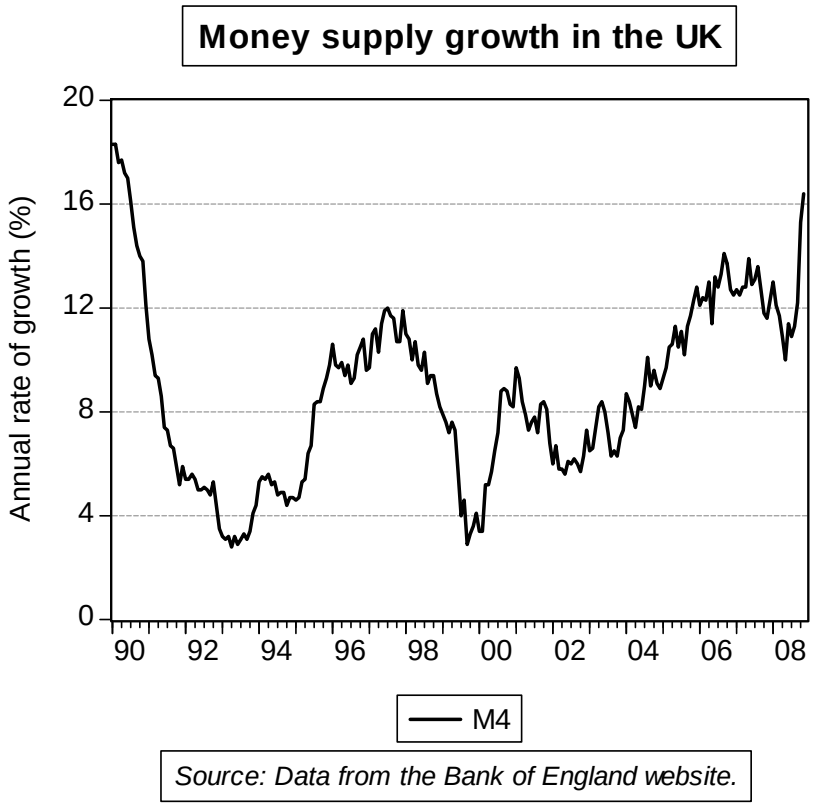
Banks lend to each other in normal times at the London Interbank Offer Rate (LIBOR). This rate in normal times is close to base rate, and is the marginal cost of funds to the banks. In times of stress, though, LIBOR has been very substantially above base rate – above it by more than the rate charged to use the standing facility. The implications of this for the regime's credibility are discussed below.

Figure 31



Source: Data from the Bank of England website.

Figure 32



Source: Data from the Bank of England website.

4.7.5. Openness, credibility and accountability

What are the key aspects of the system in achieving credibility and time consistency? Several features stand out. There is the publication of forecasts and of the model, the publication of the voting record, and of course the open letter.

The published forecasts always show inflation for all practical purposes exactly on target at the two year horizon; this is the time horizon for the forecast. This is perhaps the least interesting part of the forecast. Much more interesting are the so called "fan charts". The publication of the forecasts was intended both to communicate the Bank's view, and, on the assumption that they would be reasonably accurate, strengthen its credibility and by making the Bank more open increase its accountability. The Bank initially accommodated the inevitable forecast uncertainty by publishing a forecast band. This was replaced by a fan chart, so called because it looks like a fan since the forecast's uncertainty rises with the time horizon; the fan is a graphical representation of the probability density function of the inflation forecast for the next eight quarters. In the third quarter of 1997 the Bank published details of its model, including the parameter values. Before 1997 these were determined by the Bank; since then they are determined by the MPC. The Bank was the first central bank in the world to publish such details of its forecasting model; its policy can thus be appraised (retrospectively) more thoroughly than that of any bank which does not publish such details. It is worth remarking on a curious aspect of the fan charts. They imply that inflation uncertainty increases with the time horizon. That is surely true under some monetary policy regimes; but can it be true under a successful inflation targeting one? Under such a regime forecasts should converge on the inflation target.

The forecast and the rate decision are of course not automatic mechanical outputs of the model - otherwise all MPC members would always vote the same way. The members can differ about the course of inflation even if they agree about the assumed path of key variables. This could readily happen for example because of different weights placed on inflation expectations, on their prospects of feeding through to wages and prices, and indeed on which inflation expectations are watched. Despite this, the process is reasonably open, as the bulk of these differences (it is generally assumed) are revealed in the minutes of the MPC.

This leads us to the publication of the nominal voting record. This too is intended to reinforce the credibility of the regime, by making individuals accountable (and they can be called to account by the Treasury Select Committee), by making the unconscious of committee groupthink less likely, and by reducing the dominance of any individual. This last is a cost as well as a benefit. What if the Governor is outvoted? Once is not enough to show that on average he is not dominant; but how many times are sufficient to demonstrate he is ineffectual? And what if in retrospect he turns out to have been systematically wrong? That last is a possibility for any committee member, but least important for the outsiders and surely most important for the Governor.

Finally in this section we come to the "Open Letter". This is unique in the monetary policy making world, and gives the Bank the opportunity to explain (at any length it wishes in principle) why inflation is outside target, and to set out and explain future policy responses. If transparency enhances credibility (a point that would surely have been disputed by at least one previous bank Governor, Montagu Norman) then the letter is a good and important aspect of the system. In 2007, CPI inflation rose to 3.1%, exceeding more than one percentage point the target (2%). The open letter to the Chancellor had to be written for the first time. In itself it had no relevant policy effects, but did communicate why it had happened and the policy the Bank was going to implement to bring back inflation to target.

4.7.6. Summary and a brief evaluation

It is possible now to summarise the aspects of the system which are key to producing time consistency and credibility. First, it evolved; that has surely given it time to bed down in public consciousness, so that its removal would appear a drastic decision. Its broad outlines are accepted by every political party, as in particular are the open letter, the publication of forecasts, and the decision by committee. All these contribute to promoting time consistency. There are however several matters that undermine both time consistency and credibility. Crucial is that there is no formal procedure that has to be gone through, and justified in public, to change the target. This is a decision for the Chancellor, and he can take it at any time with no requirement to consult widely, to consult the Bank, or to publish his reasoning.

Another matter is the relationship of the rate set by the Bank to market rates, particularly LIBOR. This relationship has changed drastically under stress. Should it not stabilise fairly quickly at a level such that it clearly moves with base rate, then the functional reliability of the system will be questioned.

The system has not yet stood the test of time. Will it survive a period of stress, of for example high inflation and rising unemployment? Will it survive the present financial crisis or any repetition, when conditions in the real economy might lead to a steep devaluation of sterling and a consequently deep recession? Is it right that the Bank of England, despite not being in charge of financial inspection and regulation[51], should have to shoulder a lender-of-last-resort role? How should the lender-of-last-resort role be redefined in view of the scale of systemic upheavals in a globalised and innovating financial system?

A crucial weakness is the lack of formal procedure for political over-ride. Without such a procedure, time consistency will always be in doubt until the system is so embedded in the public consciousness that, like the gold standard, even temporary suspension except in times of dire emergency – such as war in the case of the gold standard – is unthinkable. The system has plainly been designed with the issues identified in Chapter 1 in mind; but the design has not solved the problem of how to ensure time consistency in a democracy such as that of the UK where parliament is the absolute sovereign and no government can bind its successor.

4.8. The Strategy of the Fed

4.8.1. Institutional arrangements of the Federal Reserve System : Plural and non hierarchical mandate

The Federal Reserve, although not widely recognised as such, is in fact a distinct anomaly among central banks. It has neither operational independence (nor any other kind) nor a clear-cut target for policy. To understand why it is as it is, and indeed to understand what it is, it is very helpful to go back to its early history and trace the main stages of its evolution to the present.

The Federal Reserve Act was passed in December 1913, and the twelve Federal Reserve Banks began operations in November 1914. That there were twelve Federal Reserve banks was a result of the conflict between those who wanted a central monetary authority and those who opposed it.[52] The act did not specify what would happen in the event of conflict between the Federal Reserve Board (in Washington) and some or all of the twelve district banks.

[51] These competences were delegated to a separate body, the *Financial Service Authority* (FSA), in 1997.
[52] Whether there are any precedents for the ECB in this is discussed below.

Each of these banks was allowed in law to set its own discount rate, and could buy government stock so as to earn enough to pay the interest on their own stock, which was held by the private sector. The district bank presidents all earned more than members of the Board of Governors. Power thus appeared to lie outside Washington.

At this stage the Secretary of Treasury and the Comptroller of the Currency were *ex officio* members of the Board of Governors, and the then Treasury Secretary (William McAdoo) presided over meetings of the Board. But by the end of the First World War, the New York Fed, led by Governor Benjamin Strong, had achieved a leading role in the conduct of monetary policy. (In its early years the Federal Reserve also had the duty of organising a nationwide system of cheque clearing at par; but that aspect of its evolution does not concern us here.)

4.8.1.1. The First World War

During World War I the Fed became the Treasury's fiscal agent. The Treasury deposited its funds with the New York Fed, and the Fed acted as the Treasury's banker. To facilitate War finance, the Federal Reserve Act was amended to allow banks to borrow from the Fed with government securities as collateral at a lower rate than with commercial paper as collateral. Unsurprisingly, as money creation was thus playing a substantial part in war finance, there was inflation. This inflation continued until the Treasury allowed the Fed to raise the discount rate at the end of 1919. A recession followed quickly, but the Fed raised the discount rate again, to 7%, and kept it there for almost a year. Agricultural prices fell sharply, and Congress soon added a sixth member to the Board of Governors, to represent agricultural interests.

Benjamin Strong was, however, still in New York. He came to repudiate the real bills doctrine on the basis of the experience of the 1920-21 recession, and wanted to buy and sell acceptances and government securities to control monetary conditions. This control was designed to return the US to, and maintain it on, the gold standard.

4.8.1.2. Open Market Operations

It was in this period that the Federal Reserve Banks made a discovery. They discovered that when they sold government bonds, commercial banks had to borrow from the Fed and also restricted loans to their customers; and the opposite happened when the Fed bought government bonds. The Fed had discovered open market operations, a major tool even today of monetary policy in the USA. In contrast to discounting securities, these operations could be undertaken at the initiative of the Federal Reserve banks, without waiting for the commercial banks to approach them.

The district banks were, however, still acting independently of one another in the conduct of these operations. Encouraged by the Treasury, in 1922 the Federal Reserve established The Committee of Governors on Centralised Execution of Purchases and Sales of Government Securities by Federal Reserve Banks. This committee was abolished in 1923, and replaced by the Open Market Investment Committee (which had the same membership as the committee that had just been abolished). The membership comprised five district bank governors plus the board of governors; the precedent for today is clear. The aim was to get all banks acting in unison in open market transactions; but, unlike today, any dissenting bank could opt out.

Despite these changes leadership remained with New York, because of the influence of Benjamin Strong. When he died in 1928 the system was in practice leaderless, and gripped by indecision as bank failures started. For that reason it consistently failed to act effectively as a lender of last resort (Friedman and Schwartz). There was not, despite some contrary claims, a shortage of gold. (Meltzer, 2003)

4.8.1.3. Changes to the Act

There were major changes to the Federal Reserve Act in 1933, in the midst of the depression. The Banking Act of 1933 forbad interest payment on demand deposits, and limited to 3% the rate that could be paid on time deposits. This was intended to prevent banks taking on high risks for high prospective rewards, but in fact encouraged cash hoarding and prevented small banks form earning interest on their deposits at money centre banks. In addition, the act enforced the separation of commercial and investment banking. But in the long run perhaps most important was the creation of a new agency, the Federal Deposit Insurance Corporation (FDIC). This plan had been advanced several times, but until 1933 had been rejected by Congress. Membership was compulsory for member banks and optional for non-members of the Federal Reserve; and there was a flat rather than a risk-adjusted fee as it was thought that the government would not be able properly to price for risk. Deposit insurance did put an end to bank runs, but it also preserved the unit banking system and was a partial substitute for bank capital. The wisdom of both these last measures looks perhaps even more doubtful in the long run than it did at the time.

There was further change to the Federal Reserve in an act of 1935. The 1935 Amendment increased the power of the Board and reduced that of district banks. The Open Market Investment Committee evolved into the Federal Open Market Committee (FOMC) and now comprised all seven members of the Board of Governors, plus five, rather than all twelve, of the presidents of the district banks. All presidents could by convention attend and speak, but the right to vote rotated, except for the President of the New York Fed, who was *ex officio* always a voting member.

There was then a pause in central banking legislation. The behaviour of the Fed was next affected by the Second World War.

4.8.1.4. Expanded Role of Government

The Employment Act of 1946 enjoined the government to ensure that there would be "…maximum employment, production, and purchasing power…". Price controls that had been imposed during the War were removed in 1946, there was an inflow of gold, and the Fed was still under its wartime obligation to support the prices of government securities. Pressure to continue that support, along with rising inflation, caused anxiety at the Fed. In 1949 the FOMC announced that henceforward primary regard would be paid to business conditions when setting monetary policy – so implying an end to bond price support. This matter came to a head in 1951, when the Secretary of the Treasury (John Snyder) announced that the Fed would keep the yield on long term treasury bonds fixed at 2.5%. The FOMC violently objected to this statement, and allowed the yield to rise to 2.75%. The Chairman of the Board of Governors wrote to President Truman, who wished bond prices to be pegged, pointing out the inflationary consequences of doing so. A Federal Reserve/Treasury committee was formed, and on 4th March 1951 an Accord was published.

"The Treasury and the Federal Reserve System have reached full accord with regard to debt management and monetary policies to be pursued in furthering their common purpose to assure the successful financing of the Governments requirements and at the same time, to minimise the monetization of the public debt."

This was plainly a step towards letting the Fed conduct monetary policy, but it was not a big step. In April 1951 the Fed supported a bond issue, albeit at a gently declining price. Only in 1953, with an administration (Eisenhower's) committed to "sound money" did the Fed withdraw support from the bond market.

This was followed by adoption of the "bills only" doctrine. W.M. Martin was then Chairman of the Board of Governors, and he wished open market operations to be conducted only in bills because that would be sufficient to control bank reserves while not risking the Fed being drawn into a bond market support operation. Although there were objections from the then president of the New York Fed, Alan Sproul, who wished the Fed to be able to influence the whole term structure of interest rates, the policy was implemented.

As the 1950s ended there was controversy over the Fed's instruments. There was widespread agreement that open market operations were crucial. Some (Milton Friedman for example) maintained that the discount window facility was (in normal times) undesirable and a subsidy to member banks – after all, banks could borrow in the Federal funds market. Some, however, defended its use. Since the discount rate was *announced*, so, it was claimed, there was an "announcement effect". In addition the Fed had since 1935 been able to change reserve requirements; nowadays seldom used, it was of some importance when the Fed was committed to pegging bond prices. Also at the end of the 1950s there was a change in the permitted composition of reserves; for the first time banks could count vault cash in their required reserve total.

4.8.1.5. Rising Inflation

Further changes took place in the 1960s, changes this time in the nature of Fed-Government relations. These changes took place under the pressure of rising inflation, inflation which was associated with President Lyndon Johnson's "guns *and* butter" programme of fighting the Vietnam War and introducing generous social provision at the same time.

W. M. Martin was still Chairman of the Board of Governors. He was content, indeed convinced, that the Fed should have multiple targets. These were price stability, employment, the balance of payments, and conditions in the government bond market. He was exceedingly influential, despite frequently clashing with Congress on policy. But one area in which he did not get his way was his desire to make the term of the Chairman coincide with that of the President. This would have meant changing a provision in the 1935 Act which was intended to give the Chairman some measure of independence from the President. Why Martin wished to change it is not clear.

Despite Martin's desire for price stability, inflation rose towards the end of his term. He left during a period of recession combined with rising prices. This experience had however refocused the techniques of the Fed yet again.

4.8.1.6. A Role for Money?

In 1970, under the influence of then Governor Sherman Maisel, the Federal Reserve started to pay attention to money in the formulation of policy. The concept of free reserves was important for a time. These were excess reserves minus member bank borrowing at the Fed. The reason that led to their being considered important was as follows.

Member bank borrowing from the Fed was believed to be always with reluctance, so banks did not rely on it more than temporarily. Hence, it was believed, controlling free reserves controlled the trend of reserves. Unfortunately, that turned out not to be the case; but it did show an interest in monetary quantities for the first time in the Fed's history. There was also a move to lagged reserve accounting. This remained in effect until 1984, despite its making monetary control more difficult. It made it more difficult by making banks count their reserve requirement on deposits two weeks previously, and by the complication of having vault cash count on a current period basis.

Despite this interest in monetary conditions, inflation rose, and by 1979 was sufficiently high as to lead further changes in the relationship between the Fed and the Executive.

4.8.1.7. The Chairman as Hero

Paul Volcker was appointed Chairman of the Board of Governors by President Carter. Volker was already President of the Federal Reserve Bank of New York; but, notably, he was not President Carter's first choice for the job – some of Carter's advisers apparently thought him too resolute in his anti-inflation views. Desite these concerns, he remained characterised as a resolute inflation fighter, and the subsequent policies designed to bring down inflation were identified with him. Policy became personalised and identified with the Chairman. Very soon after his appointment, following the decision that inflation had to be brought down quickly to break inflation expectations, the discount rate was raised (from 11 to 12%) and reserve requirements broadened in coverage.

Most significantly, the Fed announced that it would in its money market operations focus on non-borrowed reserves, and not as heretofore announce its policy in terms of interest rates. This was interpreted by some as a move to direct targeting of a measure of the money supply, but was in fact, as both Volker and Governor Wallich publicly stated, primarily intended to reduce the political pressure that would follow the *announced* imposition of high interest rates.

Volcker also promoted the Depository Institutions Deregulation Monetary Control Act. Inflation had created incentives for banks to leave the Federal Reserve System. There were three incentives of particular importance. Non-member banks did not have to hold shares in the Fed; these shares had a fixed and low yield. In some states banks could under a state charter hold lower reserves than the Fed required. And third, some states allowed reserve holding in (interest bearing) treasury bills.

The law was supposed to improve monetary control by bringing all institutions under the reserve requirement control of the Fed; but they were also given access to the discount window, so scope for slippage remained.

Inflation was brought down under Volcker, and he was reappointed in 1983. After a turbulent second term in which his proposals for changes in banking regulation were rejected, in 1987 he declined the offer of a third term. Alan Greenspan was appointed as his successor in August of that year. The Fed briefly remained focussed on inflation, and in September raised the discount rate. Then on October 19th the stock market fell by 508 points, about 18% of its value. The Fed eased via open market operations and increased the supply of non-borrowed reserves. After a pause, the Fed refocused on inflation, but was then hit by the Savings and Loan (S&L) crisis. Inflation had led many of these mortgage-focused institutions to pay more for their funds than they received on their loans. Accordingly, they soon got into difficulties. Part of the response was legislative.

In 1991 the Federal Deposit Insurance Corporation Improvement Act was passed. This required "prompt corrective action" when a bank or thrift's capital fell below a prescribed level; essentially the institution was closed while solvent, and run by the regulators until it could be wound up or sold on.

Greenspan was similarly successful in his other legislative proposals. He got the section of the McFadden Act of 1927, which limited bank branching to within one state, repealed. He resisted "narrow bank" proposals. He managed to defend the existence of multiple regulators, and, perhaps most important in view of recent events, he got repealed the section of the 1933 Glass-Steagall Act which separated commercial and investment banking.

4.8.1.8. Views of the Governors

There were several recent or new appointments to the Board of Governors while Greenspan was Chairman. Among these the economists (by training) are of particular interest because both in their appointment hearings before Congress and in subsequent speeches and writing they revealed a continuing debate about what the Fed should do. They discussed, in other words, its monetary policy objective.

David Mullins (appointed in 1990) wanted to achieve a steady growth of money and credit to produce a low but stable rate of inflation – low to include zero. (This of course differs from a price level stability target by accommodating price level shocks.)

Lawrence Lindsey (appointed in 1991) in answering questions about the accountability of the Fed conceded that "experts" making decisions without being answerable to the electorate could be a cause for concern. Whether this concern could be ameliorated by adopting a politically-approved (or chosen, as in the UK) target was not discussed in his appointment hearings. He thought the M2 measure of money a good indicator but did not recommend targeting it, and resisted targeting nominal GNP on data grounds – there are only twelve readings on it a year, and of these twelve eight are revisions of the other four. Susan Phillips (appointed 1991) focussed on regulatory matters both in her testimony and subsequently.

President Clinton's first appointment was Alan Blinder. He shared Governor Mullins' view that a constant price level target would be too demanding, as it could require falls in nominal prices, and favoured low to zero inflation. He left after one term. The next economist to be appointed was Janet Yellen. She faced up to the difficulties of the Fed's multiple goals – maximum employment, stable prices, and moderate long term interest rates. These are of course desirable, but the Fed is given no guidance on choices between them when these are necessary. Her contribution was to suggest that the best the Fed could do to achieve all of these was to stabilise long term inflationary expectations. Lawrence Meyer (appointed in 1996) concentrated on regulation and banking sector stability, but also spoke in favour of low inflation as the Fed's target. He favoured very limited policy activism. President Clinton's remaining appointments were Alice Rivlin, Edward Gramlich, and Roger Ferguson. The first continued her long-term focus on fiscal policy and the budget deficit, and the second his on international matters. Roger Ferguson concentrated explicitly on inflation and urged on several occasions that the Fed's most important goal is to keep long term inflation expectations low and under control.

Accordingly, then, the appointment of several economist governors did, as might be expected, lead to discussion of the Fed's objectives, but while there seemed to be some convergence at that time around inflation and inflationary expectations, there was nothing more precise than that.

4.8.2. Ecclectic approach

4.8.2.1. Changes in Operating Procedure

In the early 1990s the previously observed relationship between money and prices seemed to break down. Alan Greenspan discussed this in congressional testimony (July 1993) and revealed that in his view there was now no single measure to replace M2 as a guide. Even persistent movements in that (nor in any other monetary variable) conveyed no information.

It has been suggested that the Fed in fact behaves, either consciously or unconsciously, as if implementing a "Taylor rule" (see Taylor, 1993) – adjusting the Fed Funds rate in 0.5 percentage point steps in response to deviations of 1 percentage point from 2% inflation or potential GNP. This certainly does seem to describe behaviour fairly well. (Judd and Rudebusch (1998) find that the rule describes policy under both Greenspan and Volcker, with the interesting variation that the response to output variations exceeded that prescribed by the rule under Greenspan, while the response to inflation variations exceed the rule's recommendation under Volcker). Governor Gramlich has suggested basing policy explicitly on this rule, with policy responding when the target variables moved outside their predetermined bounds. He suggested (2003) that the Fed engage in "Flexible Inflation Targeting". This involves announcing a two year inflation target, but allowing deviations in response to supply shocks. His suggestion has not yet been adopted.

Figure 33

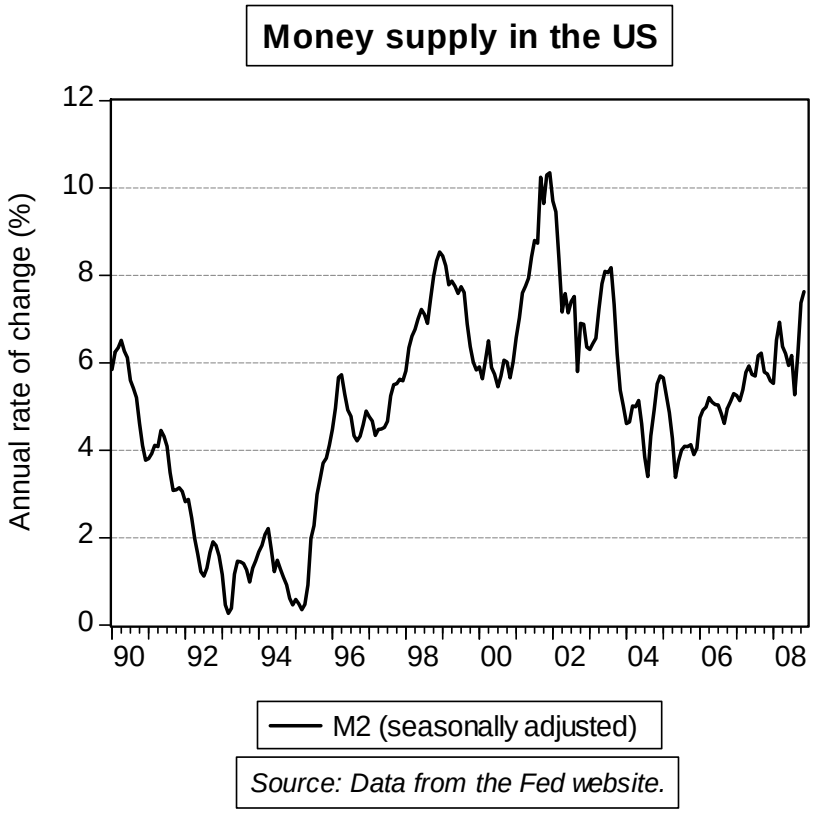
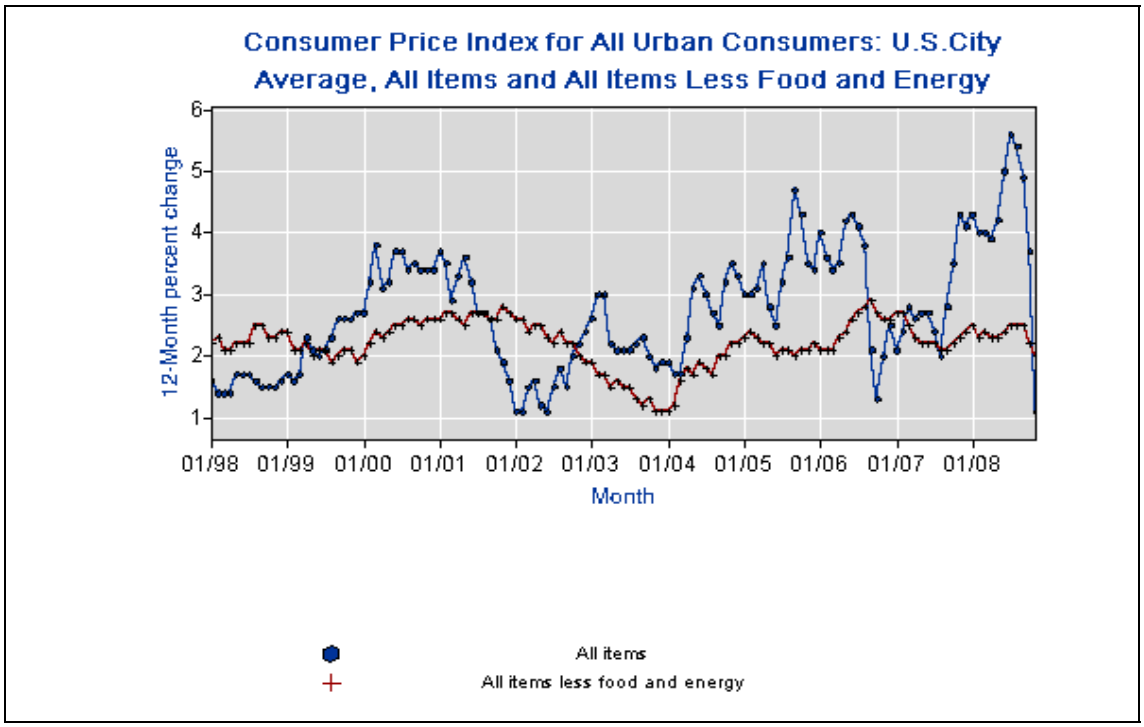
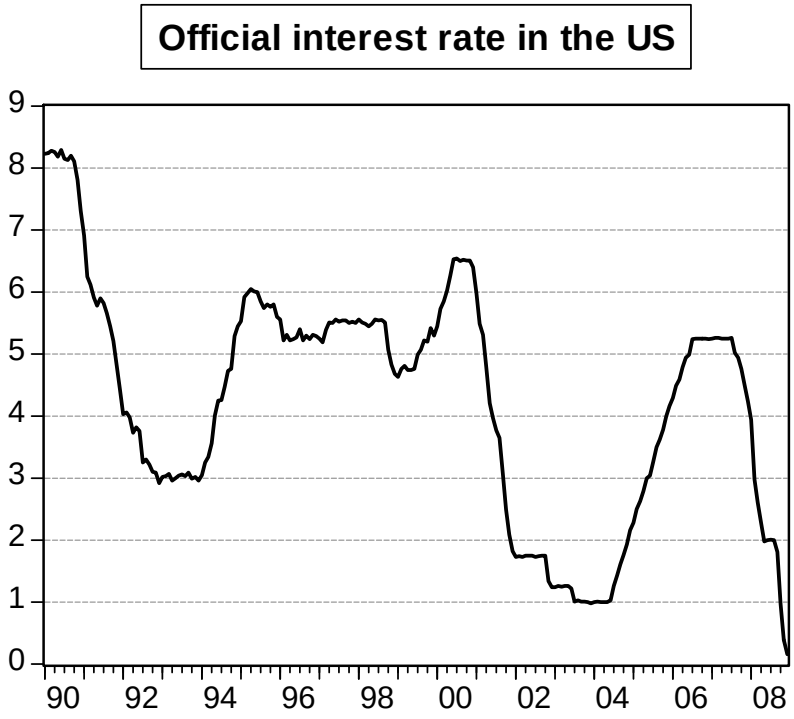


Figure 34: CPI in the US (all items less food and energy)



Source: Bureau of Labor Statistics. U.S. Department of Labor.

Figure 35



4.8.2.2. Changes in Openness

Since 1994 the FOMC, which meets eight times per year, plus unscheduled meetings as seem necessary, has published its policy decisions whenever they were made, rather than after a delay. There was also at that time the tying of the discount rate to the funds rate, making it always 1 percentage point higher, thus losing both the announcement effect and the possibility of a subsidy to member banks.

There is also the question of the minutes and votes of the FOMC, and, subsequent to that, the importance of "dissents".

Minutes of the meetings are now published. Beginning with the 1994 meetings, the FOMC Secretariat has produced transcripts shortly after each meeting from a recording of the proceedings. The remarks of each speaker are "lightly edited, where necessary, to facilitate the reader's understanding". Meeting participants are given an opportunity to "review" the transcripts before publication. Details of how the pre-1994 transcripts have been prepared are below. The phrases in quotations are from the Federal Reserve's own description of what is done; no example of these procedures has ever appeared.

A "dissent" is when a Governor or Regional Bank President differs from the majority view. How important are these? So far as immediate policy goes, obviously of none. The questions are how serious a division of view they represent, and whether they have any import for future policy.

As to the first, a dissent is believed to vary in significance with the Chairman. Some try hard for consensus, some object strongly to dissents, and some, apparently close to the UK model, are more relaxed. In any event, there seems to be no particular significance of these for future policy.

Minutes and transcripts

For the meetings before 1994, the transcripts were produced from the original, raw transcripts in the FOMC Secretariat's files. These records have also been lightly edited by the Secretariat to facilitate the reader's understanding. In addition, where one or more words were missed or garbled in the transcription, the notation "unintelligible" has been inserted. In some instances, words have been added in brackets to complete a speaker's apparent thought or to correct an obvious transcription error or misstatement.

Nonetheless, for the pre-1994 transcripts, errors undoubtedly remain. The raw transcripts were not fully edited for accuracy at the time they were prepared because they were intended only as an aid to the Secretariat in preparing meeting minutes. The edited pre-1994 transcripts have not been reviewed by present or past members of the Committee.

In transcripts from all years, a very small amount of information received on a confidential basis from, or about, foreign officials, businesses, and persons that are identified or identifiable was subject to deletion. All deleted passages, indicated by gaps in the text, are exempt from disclosure under applicable provisions of the Freedom of Information Act.

4.8.2.3. Clear Targets Again?

In recent years, with the appointment of more (academic) economists to the Board of Governors, there has been further discussion of adopting an explicit inflation target. What is of course striking about this discussion is that at least some Fed officials appear to believe that the Fed could do this without the consent of Congress, although of course Congress could explicitly prohibit it. No such step has as yet been taken; but the discussion surely reveals the unusual constitutional position of the Fed.

4.8.3. Lender of Last Resort

Finally in this review of the action and position of this constitutionally curious central bank we come to its role as Lender of Last Resort[53].

That role traditionally involved the provision of liquidity on collateral at a time of general shortage in the banking system. The Fed carried out just that action several times in the years immediately after its creation. Then, strikingly, it failed to do so in 1929-1931, and thus produced the Great Depression (Friedman and Schwartz). It was this failure that led to the creation of the FDIC (see above).

In very recent years there has been a further development. In the financial crisis of 2008 the US Treasury became involved in assisting the banking system. Why? So far as can be seen, this is because, after some initial confusion, it became clear that the problem could well be shortage of capital, not shortage of liquidity. (This appears, too, to be the problem in the UK.)

If the diagnosis was correct then Treasury intervention was inevitable, for the Treasury, unlike the Fed, has access to taxpayers' funds, and only these would be sufficient; the Fed, like every other central bank, does not have capital sufficient to help the banking system.

[53] A review of the development of this concept, and of how some central banks carried it out, can be found in Wood (2000).

4.8.4. Concluding Observations

The first is to emphasise how anomalous, and indeed unclear, is the constitutional position of the Fed. It is partly privately owned, but essentially run by the Government; (Regional Bank Presidents are before appointment vetted by the Board of Governors). It has no clear mandate, and sometimes seem to think it can choose its own. Created in 1913, it has evolved steadily since then, sometimes in opposition to the Government. What this means for its credibility is obscure in general; the historical experience suggests that the credibility of the Fed is highly dependent on its Chairman.

The second, of particular importance for the Eurosystem, is the change in its Lender of Last Resort role. The role changed because of the need for capital. Who would provide the capital in the Eurosystem? The answer may be clear for a bank operating essentially in one country. But with increasing European integration, such banks are becoming rarer. Who could, who would, take responsibility for such banks is not clear.[54] It should be.

Finally, the US system of financial regulation is not a system but a patchwork, largely reflecting history and political attitudes of distrust for finance rather than a coherent thought out position. Banks can be regulated by the Federal Reserve, but they can also be chartered, and therefore regulated, by states. It is also possible for banks to change from one situation to the other, according to where they see advantage. The important point to emphasise is that no overall economic reasoning can be inferred into the situation one observes at any time.

[54] This issue is discussed in detail in Mayes and Wood (forthcoming), see References.

5. POLICY IMPLICATIONS AND LINES OF REFORM OF THE ECB STRATEGY

5.1. Theoretical considerations

The provision of low inflation is the primary goal for most modern central banks as inflation is costly for many reasons (see Section 1.1.1.). While the high costs of inflation suggest that low inflation should be a goal of central banks, why should it be the primary, or even the overriding objective? High employment and output are desirable, so why should they, too, not be part of a central bank's objectives? In the 1960s most academics and policy makers believed that there was a long-run trade-off between inflation and unemployment and output; society could enjoy a higher level of economic activity if it were willing to tolerate the higher inflation. However, by the end of the 1960s, this belief had waned (for the arguments on the Phillips curve, see Sections 1.1.2. and 1.1.3.).

However, the *expectations-augmented Phillips curve* might suggest that monetary policy could possibly be used to smooth business cycle fluctuations if the central bank has an information advantage over the private sector (see Section 1.1.3.). An unfortunate implication of the relationship between unexpected inflation and employment and output is that it creates an inflation bias via the so-called time inconsistency problem. Society would be better off if the government could commit itself to not inflating. In this case there would be no unexpected inflation. Employment and output would be the same as in the time-inconsistency scenario and there would be no inflation.

As a consequence of the view that low and stable inflation is desirable, that monetary policy cannot be used to systematically increase employment and output, and that long and variable lags in monetary policy limit its usefulness in offsetting transitory shocks it is now common to mandate price stability as the principle goal of the central bank. Given the time-inconsistency problem, however, it is not enough to mandate the pursuit of low inflation. The government must find some way to commit itself to low inflation. Unfortunately, however, as law maker, judge and enforcer, it is difficult for a government to compel itself to behave in a particular way.

It is widely believed that a good way to lessen the time-inconsistency problem and to ensure price stability is to make the central bank operationally independent of the government and to give it an inflation target. This is the reasoning behind the wave of central bank legislation that introduced inflation targeting around the world. The above arguments suggest that a central bank should target zero inflation, but a number of practical considerations result in a wide-spread view that the target should be between 1 and 3% for an advanced economy.

Central banks have various instruments at their disposal - such as open-market operations – to meet an inflation target. However as the relationships between their instruments and inflation are difficult to infer, central banks often have intermediate targets that are both more directly related to inflation than their instruments are and more easy to target precisely using their instruments than inflation is. During the 1970s and 1980s, monetary aggregates were a popular intermediate target. However, due to the lack of a stable relationship between money and prices, the targeting of monetary aggregates has been abandoned and most inflation-targeting central banks have adopted short-term interest rates as intermediate targets.

There is a cost to devising institutional structures that cause central bankers to focus on inflation to the near exclusion of employment and output. While it is not possible for central banks to *systematically* increase employment and output, as discussed earlier, it is theoretically possible, although practically difficult, for central banks to offset transitory random shocks if they have an informational advantage over the public. That is, there may be some *stabilisation* role for central banks. Central banks cannot affect the levels of real variables, but perhaps they can affect their variances. If the central bank is unwilling to tolerate any variance in inflation, however, it will be unwilling to smooth real variables.

A sizable body of research has grown around the problem of designing a central bank that is both credible that it will pursue low inflation and flexible enough to respond to shocks. It is generally believed that using monetary policy to fine-tune the economy is not possible. However, a central bank should not permit or create unnecessary turbulence in employment or output. If some large, visible event created a collapse in domestic demand, it might be that the central bank ought to pursue a more expansionary policy than would be sufficient to ensure price stability. In the face of a sufficiently large and visible supply shock, say a rise in the price of oil, it might be that the central bank should not pursue a monetary policy that is contractionary enough to ensure that it hits its inflation target. If the communication strategy of a central bank is good and if a central bank has a reputation for inflationary toughness, then failing to pursue its mandate to the letter in the face of a rare, large, easily observable event should not cause a serious problem.

5.2. Institutional lessons

The comparative analysis of the institutional and policy arrangements of different central banks (CBs) can help evaluate the pros and cons of the ECB strategy. The institutional arrangements of the ECB should be those that allow the achievement of its target with minimum short run costs; which requires the central bank strategy to be predictable and transparent. Some of the institutional elements and the policies of other CBs could be usefully applied to improving ECB strategy. Still, drawing lessons from the practice of other CBs should be subject to the proviso that institutional arrangements about governing bodies, decision-making, voting procedures, transparency, and communication are not easily transportable from one central bank to another. One should not forget that launching the euro and running a single monetary policy for a Union of diverse nation-states show significant idiosyncratic elements.

5.2.1. Institutional arrangements

5.2.1.1. The target, the mandate

In order to be predictable, a single policy target, or a clear hierarchy of plural targets, must be set in the statutes and applied in the day-to-day policy arrangements of the CBs. Most CBs have inflation as the single or primary policy target (undoubtedly so the ECB), and the chequered experience of the Fed, with the double statutory aim of employment and low inflation, indicates the advantages of a single mandatory goal or at least of a lexicographic arrangement of goals for the proper functioning of CBs. The difficulty encountered by China in its management of the price level while trying to sterilize the accumulation of foreign reserves occasioned by an undervalued yuan shows the difficulty of double remits.

As to the quantification of the target, most central banks have defined price stability as an increase of a price index (be it the CPI or the GDP deflator) in the range of 1-2% a year. CPIs are widely accepted as measures of inflation by the public and they are easy to monitor and interpret; and thus are useful variables to inspire monetary policy and transmit CB expectations. However, since the different indices do not take into account all the prices in the economy but rather a basket of representative consumption goods and services, they are not totally accurate measures of the purchasing power of the currency.

A general defect of CB strategy, also of the ECB's, is an asymmetric attitude towards inflation and deflation. Deflation is feared and guarded against, even when benign as brought about by technological advance and lower production costs. Small inflation on the other hand is seen with greater indulgence. As a result, adopting a minimal but positive inflation rate as a policy target may imply a de facto inflationary policy in times of economic growth brought about by increases in productivity.

5.2.1.2. Lender of Last Resort

A function not directly mentioned in the remit of CBs is that of Lender of Last Resort (LoLR), though the 1913 Act that created the Fed did speak of an obligation to supply a "flexible currency" that would "satisfy the needs of trade". Whether mentioned or not, one of the main obligations of a CB is counteracting systemic risk, even at the cost of the short term creation of liquidity causing inflation later. During the present crisis, the possible need to save the financial system of countries in the euro area or aspiring to enter has led to questioning the Maastricht Treaty rule of no bailouts. If the CB is expected to be a LoLR, then someone must perform the functions of regulation, supervision and inspection. Who should be in charge of those functions is a moot question and one where arrangements differ markedly from place to place.

5.2.1.3. Independence and accountability

There are wide differences in the degree of independence that CBs enjoy. Arrangements go from merely operational autonomy to almost full independence: from a conference of authorities for important decisions at the People's Bank of China; or the Treasury Minister setting the inflation target (UK); or the Minister and Governor temporarily setting aside the goal of price stability in exceptional circumstances (NZ); to the arrangement of no political instructions whatsoever at the ECB. The arms-length relationship with the European Parliament, the Commission, and National Governments/legislators seems to be of the essence of the ECB's independence and the stability of the euro, as is the prohibition to lend to European and national institutions, except for purposes of monetary policy.

However, these Chinese walls do pose the question of how democratically accountable the ECB is. The ECB can be considered as one of the most independent central banks, and thus it should also be equally transparent and predictable. Unlike other CBs, such as the Bank of England (BoE), the ECB does not publish its working model of the economy nor does it the voting record and the minutes of its Governing Council meetings. Rather than a means to preserve its independence from local interests and national public opinions, the comparative lack of information provided by the ECB makes it more opaque and less predictable. Ten years after the launch of the euro, the ECB could usefully make a clear move towards more transparency in line with other CBs, in order to gain credibility, be more predictable and in effect more accountable.

This increase in transparency and openness to differing opinions can be achieved in various ways:

1. Following the BoE, the Fed or the BoJ, the ECB could publish the Governing Council minutes, including the voting record, just after the meeting or with a short delay

2. The governor of the BoE must send an open letter to the Chancellor of the Exchequer when it misses the inflation target by more than 1 percentage point; in it, the Governor must explain why the target was not achieved and the measures planned to bring inflation back on target. If adopted by the ECB, this would provide an additional channel to transmit useful information to the market on the recent and expected path of monetary policy.

3. As with other central banks such as the Fed, reporting by the ECB to the European Parliament should be more detailed. In particular, sessions of the so called "monetary dialogue with the ECB" could be made informationally more effective: short summaries of the published position of the ECB on the topics to be discussed could be circulated among MEPs before the hearing; monographic sessions on selected topics of ECB policy could be organised; and in all sessions, MEPs should have the right to ask supplementary questions after the fashion of the UK Parliament. All this would make the ECB more accountable to the European Parliament while not reducing its statutory independence.

Independence is also linked with governance. When policy decisions are taken by consensus, as normally happens at the ECB, the president effectively enjoys special weight. Within the smaller executives of other CBs, such as the Open Market Committee of the Fed or the Monetary Policy Committee of the BoE, the members have in effect a greater say. As regards the rules for eligibility and term limits, the example of the Monetary Policy Committee of the Bank of England, with a small number of members chosen on the basis of professional competence and not of nationality, could be followed at the ECB. If adopted, it would result in a smaller board with more fully responsible members. In this sense, adopting a decision by consensus inside a Governing Council of more than twenty members makes true discussions difficult and readily insubstantial.

5.2.2. Implementation of monetary strategy

In current circumstances everyone is asking themselves two questions:

> (i) Without the benefit of hindsight could monetary policy have been run in a manner that would either have avoided the present crisis or at least made its impact milder?
>
> (ii) With the benefit of hindsight can monetary policy be improved so that there is greater stability in future?

The ECB's monetary policy has largely conformed with current normal practice. Where it did not, such as the overbidding problem in early open market operations, it moved quickly to a more conventional position.

In order to achieve price stability the ECB aims to achieve inflation in the HICP below, but close to 2% year on year, over the medium term. While this is a somewhat vaguer commitment than that of inflation targeting central banks, it is difficult to criticise the ECB for the success or failure of its policy until well after the event, it is in line with common practice among central banks in the OECD, who typically aim at inflation in a 1-2% range over an undefined medium term.

However, similarity to others could reflect a common misperception. Having inflation as high as 2% a year does not represent a stable price level. Even after allowing for mismeasurement of perhaps 1% a year, this will represent major erosion of purchasing power for pension provision. Especially when it is accompanied by exceeding the target as has been the case in the euro area.

In recent years there has been an increase in interest in price level path targeting which would eliminate this upward drift and erosion. Now that inflation has been brought down to low levels, the concerns that price level targeting might have an enhanced threat of hitting the zero bound or leading to deflation are misplaced. In present circumstances price level targeting is likely to lead to a stronger fight against deflation than inflation targeting.

Of greater concern is whether, despite its two-pillar strategy the ECB has placed insufficient weight on the monetary pillar. The ECB was initially rightly criticised for the lack of transparency in having two pillars (economic and monetary) on which policy decisions would be based, without any clear explanation of how conflicts between them would be recognised. Since the revision of the policy stance in 2003 the main basis for short-run monetary policy has been the conventional economic pillar with money acting as a cross-check. Normal practice in other central banks would include all the monetary information inside the formulation of the view of the future but having it as a specific cross-check makes the role clearer.

As Beck and Wieland (2008), inter alia, point out monetary information can help show that analysis based on 'gaps', for example, in output or unemployment from their non-inflationary trends, is likely to be mismeasuring the trend. Monetary growth, clearly inconsistent with the growth of economic activity and expected trends on velocity is likely to indicate a potential problem for inflation in the future. Unfortunately in the ECB's case the problem was that monetary growth from an early stage indicated such a problem and yet seemed clearly at variance with a muted economy. Such deviations were therefore described as 'portfolio' shifts – one-off shifts in behaviour that have no implication for the underlying relationship between money growth and inflation. Monetary indicators, just like real economy indicators suffer from the same reliance on unobservables. Any concept of excess monetary growth can only be measured relative to some sustainable baseline determined by a view of how the unobservable underlying relationship is developing.

The same problem can be transformed to the interest rate (price) rather than money (quantity) dimension. In a Wicksellian framework a simple monetary rule would be to try to track the 'natural real rate of interest' through the cycle. But this natural rate is not observable; we can only hypothesise on what natural phenomena reflect it. Even though the single value is unobservable, the trend of the natural real rate of interest compatible with price stability in the long run could be a guide for policy making.

It is important to note that it is neither the nature of the model underlying the explanation of the transmission mechanism nor the estimates of the gaps in the economy – whether output gaps or deviations of price expectations from the ECB target – that are the explanation of much of the discrepancies over the period, but the choice by the ECB of interest rate settings that lay below that prescribed by a simple Taylor Rule (a point developed at greater length in the section below).

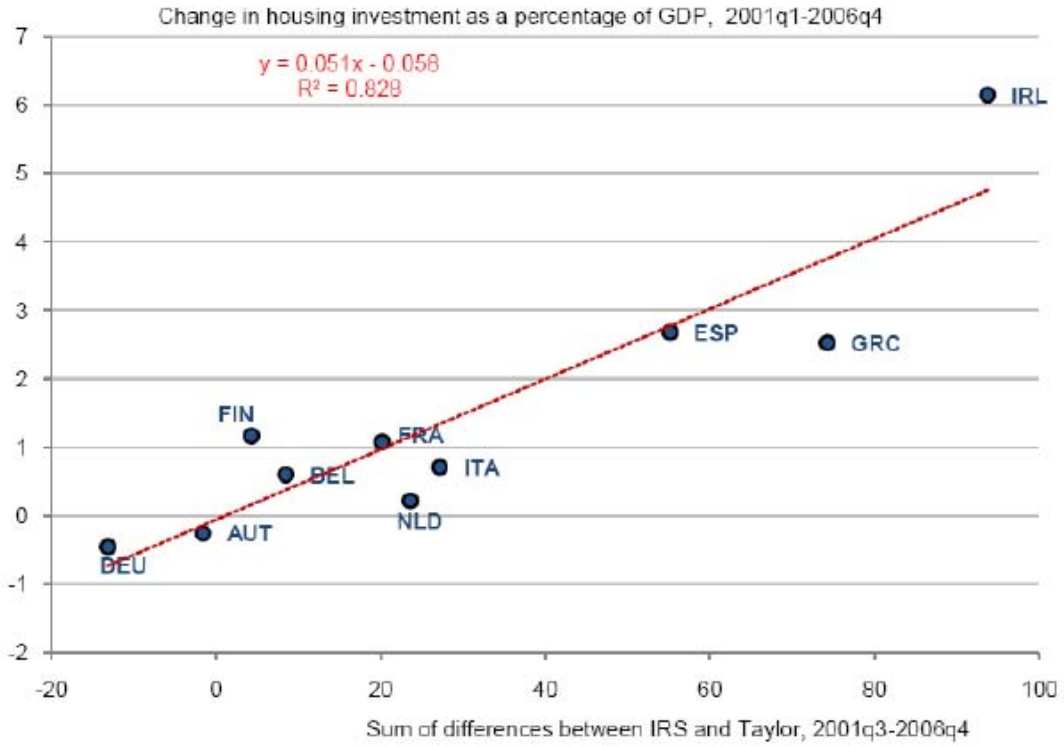
5.3. The relative success of the ECB

We can address two questions. The first is simply how successful the ECB has been in achieving its own targets. The second is whether the ECB could have performed better, both in achieving its targets more closely and in achieving them at lower cost (measured perhaps in terms of output fluctuations). There is however a third issue which to some extent is peculiar to the euro area which also has an impact on policy. We consider that first.

In any economy there will be variations in the appropriateness of monetary policy for individual regions or industries, or even for individual households and firms. More than that, some industries are disproportionately affected by monetary policy compared to others. This is in part the normal concern that monetary policy is a blunt instrument and does not tackle inflationary problems in the economy in a manner that is closely focused on their origin. In a well-developed unitary economy, even a diverse one like Canada or the United States there are various corrective mechanisms that will offset this poor aim, particularly fiscal redistribution. In the euro area not only are such mechanisms very limited but the area itself is only in the process of coming to terms with the common policy and the single currency area. While this would imply simply a cost to a single monetary policy if the problem were symmetric but the policy was still appropriate, inflationary processes are very obviously asymmetric.

This is perhaps illustrated best by the case of house price inflation. Taylor (2008) shows (Figure 36) that if one considers the departures of the single monetary policy from what would be implied by a Taylor rule applied individually to each country, the cumulative departures are clearly positively related to housing investment. Applied to prices this generates a much stronger cycle in the countries for whom policy is ‘too loose’ and a consequently sluggish performance for those for whom the policy is too tight. However, with asymmetry the consequences for those countries for whom the policy is too loose will be much more extreme. While this may imply that monetary policy should take account of such asymmetries on the whole this is not a problem that a single monetary policy can address. It simply reflects that the euro area is not an optimal currency area. Finding other policies to offset this effect until such time as the area approaches such an optimal state will be difficult but clearly some progress can be made through the tax system.

Figure 36



Source: Taylor (2008)

To some extent deficiencies in the overall setting of policy by the ECB will simply reflect the problem of overcoming this heterogeneity.

Assessing the success of ECB monetary policy simply in terms of the achievement of its objectives tells us relatively little. Since the first year or so when much of inflation will have been determined by the predecessor central banks, inflation was above 2% in every year and averaged 2.2% in 2001-2007. (It was 3.3% in 2008.) The ECB has tended to try to explain this away by suggesting that this period has been subject to a number of special factors but this is true of any period. 8-10 years is quite long enough for a learning period. Normally, in any process of learning, policy will overshoot in both directions. It is difficult to zero in directly on the target. The common experience of inflation targeting countries for example has been that initially they overestimated how high interest rates would have to be to contain inflation. Then followed a period when they eased too much as they tried to find where the new equilibrium was but after that their track record has been quite good.

It is clear therefore that there are some persistent errors in the ECB's processes. One option would be that the Eurosystem's forecasting has been biased. This is certainly the general experience that Beck and Wieland (2008) attribute to both the Federal Reserve and the Bundesbank over the 1970s, 1980s and 1990s. The ECB itself noted an error that had introduced a downward bias into its Narrow Inflation Projection Exercise. If the information input is somewhat biased it is difficult for policy-makers to overcome this as they have to make judgements that disagree with their assessment of the impact of a policy stance. However, in time one would expect just that adjustment to take place. This therefore implies that even if there have been errors in the outlook presented to policy-makers, there have been problems in policy-making as well.

One commonly cited cause is the Eurosystem's decision-making process whereby a large committee agrees on policy actions by 'consensus'. If other monetary policy committees operate by something that is closer to a simple majority then they would tend to be more activist. Some inflation targeting countries, such as the UK and the Czech Republic, have indeed shown rather more dissent from the agreed policy but in general, the number of those 'outvoted' in monetary policy committees who feel sufficiently strongly that they need to record their dissent is quite small.

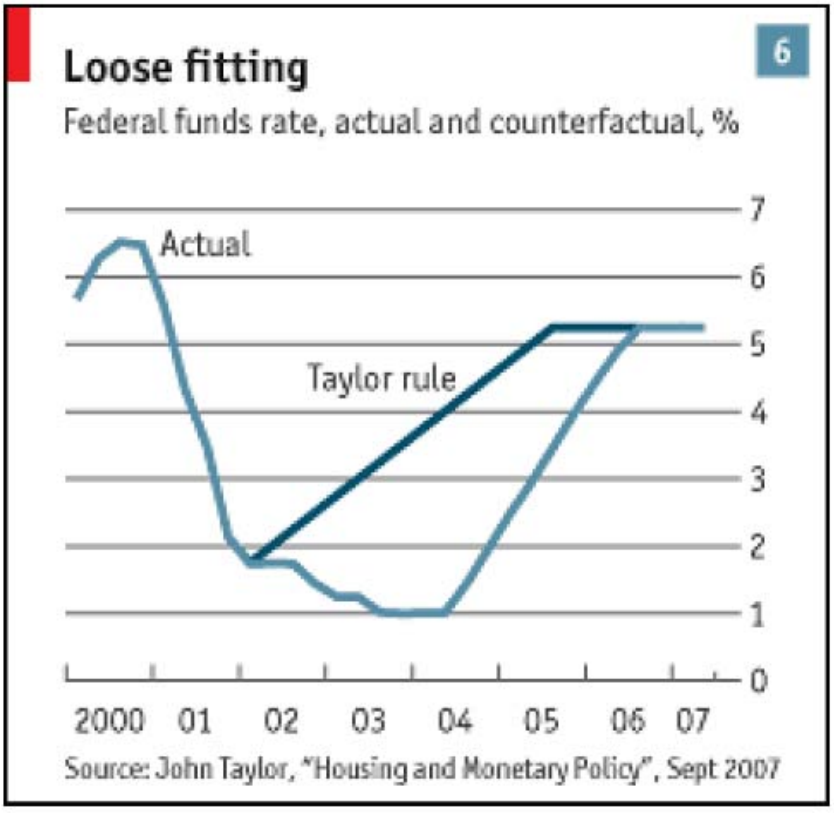
It is probable that the Governing Council has been rather over-obsessed by the need to show unity in supporting their decisions and have hence been rather keener on unity of view than may have been the case elsewhere. Other monetary policy committees permit the public expression of different points of view and have not found that their credibility has been undermined be such diversity. Under uncertainty everyone expects views to differ and seeing the extent of the difference makes policy more predictable. Both the Federal Reserve and the Bank of Japan have been able to convey more information about the extent of uncertainty by publishing Board members' views about the future values of key variables in the economy that affect policy. These do not identify which members thinks what but they give an idea of the distribution of views. Since markets appear to find this useful the ECB could beneficially make a similar move, which would result in a more predictable policy. However, as to the reform of the ECB communication policy, the views need not be identified with individual Governing Council members in order to avoid national governments pressure.

One obvious cause of a less active policy has been that the ECB has not wanted to surprise markets and has hence tried to make its policy intent clear in advance, thus to some extent virtually delaying decisions by a month. However, delay should not lead to a bias in favour of inflation unless shocks are asymmetrically in favour of inflation.

One trend used elsewhere among inflation targeting central banks that the ECB has resisted to is to give a clear idea of the requirement on future policy to bring inflation back into line. Only the current decision is announced with oblique indications of future steps through the use of code words such as 'vigilance'. A more direct approach, setting out a path, as is practised in Norway, Sweden and New Zealand could be helpful to give greater credibility to the willingness to act. A step in the right direction, however, was moving the forecasting basis from an artificial 'constant policy' criterion to a more realistic use of 'implicit market assumptions'. Without that, forecasts tend to be inconsistent and implicitly take the effect of likely policy into account so that the forecasts always turn out to be relatively on target. One consequence of this is that, in simulations, it will always look as if policy can achieve relatively little, thereby introducing a bias against strong action.

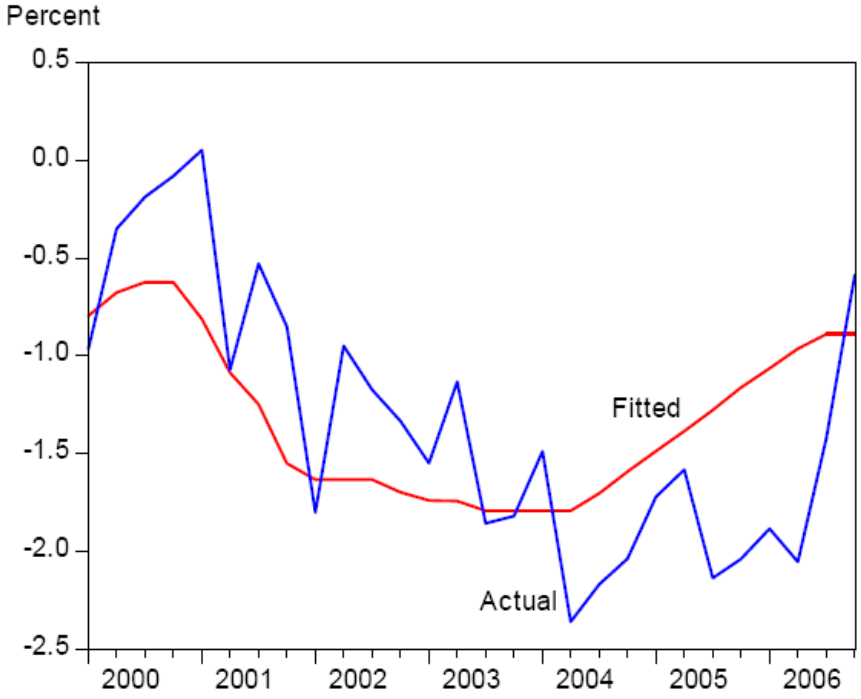
However, Taylor (2008) provides a neat assessment of the ECB, which offers a very plausible explanation. He attributes much of the mis-setting of policy to a tendency to follow US interest rates. He documents dramatically how since 2001 the Federal Reserve has deviated from what a simple Taylor Rule would prescribe (Figure 37). While short period deviations are nothing unusual a sustained deviation on this scale will result in a major inflationary distortion. Taylor then applies the same methodology to the euro area and shows that the ECB's own departure from a Taylor rule can largely be explained by the degree to which the ECB has followed the interest rate setting of the Federal Reserve (Figure 38).

Figure 37



Source : Taylor (2008)

Figure 38
ECB actual rates vs. Taylor rule fitted rates



Source : Taylor (2008)

It is difficult to explain the origins of this excess following of the actions of the Federal Reserve but there are two obvious candidates of explanations. The first is simply that the decision-makers all have an experience in countries that were small relative to the United States and that were much more open than the euro area is to external trade. Applying that experience would assign a higher role to US policy in determining economic conditions in the euro area than was actually the case. A second explanation would be an understandable diffidence in suggesting that a new player could have an extensive and different impact on activity and inflation. A third explanation is that the Governing Council had similar misperceptions of the inflationary pressures in Europe to those their colleagues in the FOMC had of the US.

Perhaps what is most disturbing is that John Taylor attributes an important part of the US's failure to emerge from the recession as being due to a misperception of the causes of the current problems. The ECB appears to be going down the same policy route, with a delay. If that is similarly driven by an incorrect perception of the nature of the crisis then it too will prolong the recession. Taylor is firmly of the view that current problems are caused by risk not by lack of liquidity – pursuing the wrong objective will simply lead to an ineffective programme of quantitative easing as was observed in Japan in the 'lost decade'. Moreover, the persistent downward bias of official interest rates compared with rate levels compatible with long-term price stability indicates that both economies have run too easy monetary policies, possibly one of the causes of the recent instability in the markets. A decade of apparently low inflation as measured by consumer price indices induced a cheap credit policy that contributed to the onset of the present crisis.

The ECB sets some store by having a monetary policy that is not very responsive or active but steady. However, this in itself can cause greater fluctuations in the economy as it allows booms/inflation to develop further and recessions to be deeper. An ideal policy is anticipatory but often not feasible, a lagging policy can be just as destabilising.

5.4. Practical questions

5.4.1. Additional and unsettled questions

5.4.1.1. The Centralisation of Supervision in the EU

The centralisation of supervision is a subject which covers two areas. The first is whether the central bank should be separated from the supervisory authority. The second is whether, whichever body does the supervising, it should be EU-wide, euro area wide, or national.

5.4.1.1.1. Central Bank – Supervisory Separation?

When Northern Rock ran into difficulties in the UK, the Bank of England seemed completely unprepared. Why was that? There may have been institutional reasons internal to the Bank. Some have suggested that it concentrated too exclusively on its monetary stability brief: see, for example the article by Clive Crook in the "Financial Times" of 17 February 2009. But there was also another reason. When the Bank of England was in 1997 given instrument independence to conduct monetary policy, it lost the tasks of debt management and financial supervision. Because it no longer had the latter, it no longer received reports on individual banks. It could of course get anything it asked for from the FSA. But what use is that? How could it know what to ask for? The lesson of this has been learned, or perhaps, to put it better, forced on the Government by a report by the Treasury Select Committee of the House of Commons.

That report suggested the establishing within the Bank of a Financial Stability Committee, parallel in authority to the Monetary Policy Committee, and integral to both the Bank and the FSA. The crucial parts of the FSA's information flows would thus, as they passed up the FSA, be passed also to the Bank. This scheme goes a long way towards addressing the information problem.

The lesson this might suggest is that it is even better if the central bank actually does the supervision. After all, when the Bank of England supervised banks, there were no banking sector problems of any significance. But when the Bank had that responsibility the banking system in Britain was both smaller and simpler. Further, there is an inevitable problem – perhaps two such problems – with a central bank being responsible for supervision. The first is that when a bank runs into difficulties the question of why the central bank did not prevent that will inevitably be raised. That the purpose of supervision is to foresee and contain the consequences of difficulties is beside the point so far as popular concern goes. In such circumstances the reputation of the central bank, of the greatest importance when conducting monetary policy, will be contaminated. A second problem is the possibility of "capture". Supervisors inevitably get to know those they supervise. This might lead to regulatory forbearance, or even to lax monetary policy for the sake of assisting the banking system.

There is no ideal correct answer. But it does seem on the balance of argument that an intimate connection between the central bank and the supervisory authority is preferable to the supervisory authority being part of the central bank. The new UK model is of course yet to be tested, but it is in some ways closely analogous to the model in Germany when the Bundesbank ran monetary policy for that country.

5.4.1.1.2. Europe-wide Supervision?

There are two issues under this heading. Europe aims to maintain a single market across all fields of economic activity. Does this require that financial services be supervised on a Europe-wide basis? And second, should banks which can borrow from the ECB be supervised by a European supervisory authority, whatever that body may be?

The existence of a single market does not self-evidently require a single regulator. The example of the USA shows this: there are substantial banks with a state charter and therefore supervised by the state supervisor. Whether or not that is efficient is an interesting and important question, but one to which no clear answer has yet been given. It would seem on logical grounds that there is no necessity for a single regulator within a single market, so long as a common core of regulatory principles applies everywhere in the EU.

What of banks having the right to borrow from the ECB? Does that require centralised EU supervision? Consider first the case within a country. There is interesting and useful guidance in "The Art of Central Banking" by Ralph Hawtrey (1932). He pointed out there that the purpose of a central bank's taking collateral for loans in a crisis was that since the collateral provided security, there was no need, in that emergency when time was short, to undertake the time-consuming process of examining the solvency of the borrower. By extension, so long as the ECB takes collateral, there would appear to be no need to supervise.

The one objection to this is when the collateral turns out to be inadequate. If this were on other than a trivial scale, the question would then arise of who would cover the ECB's losses. Of course, since supervision cannot prevent all failures, the question might arise anyway.

Whether home country supervision with the ECB informed, or Europe-wide supervision with the ECB informed, or supervision by the ECB, is the system adopted, the question of who covers ECB losses still merits consideration. It might seem to suggest that the dictum that a monetary authority requires a fiscal authority with the same domain requires reconsideration.

5.4.1.2. Asset prices and monetary policy

In the late 1990s, there was a widespread view that inflation-targeting central banks should not be concerned with asset prices. Indeed, the influential work of Bernanke et al. (1999) neglects the topic of the relevance of asset prices for monetary policy almost entirely. However, the so-called bubbles in housing and equity markets in the early 2000s focused attention on this issue. Equity and land booms had occurred throughout Europe, Asian and Latin America since the 1980s and were often followed by financial crises and sharp economic contractions. Some central bankers suggested that monetary policy committees should respond aggressively to bubbles; leading UK monetary economist Charles Goodhart (2001) to make the perhaps most radical proposal: asset prices should be part of the consumer price index used to measure inflation. In this section we consider whether asset prices should be part of the central bank's price index, whether central banks can and should attempt to prick bubbles and whether asset prices provide useful information to policy-makers.

5.4.1.2.1. Asset prices should not be in the central bank's price index

Current price indices used by central banks are measures of the purchasing power of money over current consumption and do not generally include asset prices. The theoretical justification for including asset prices in the central bank's price index is that households care about both current and future consumption. If it is to be a welfare measure, inflation ought to measure the fall in the purchasing power of money over current and *future* consumption. Thus, the central bank's price index should include the current money prices of current goods and services and the current money prices of future goods and services.

To see how constructing such a price index might work, consider a world that has a single consumption good and that lasts for two periods. Then the period-one price index should include the period-one money price of the good in period one and the period-one money price of the good in period two. As markets for purchasing consumption goods intertemporally do not usually exist, households use period-one money to buy period-two goods by purchasing financial assets in period one and then using the savings and interest to buy the good in period two. To purchase a unit of the good in period two with period-one money, the household must have nominal savings equal to the period-two price divided by the (gross) nominal interest rate. This is equal to the current price of the good divided by the (gross) real interest rate. This suggests that the price index should be a weighted average of the current price level and an asset price: the real interest rate.

In the short run, frictions in the economy mean that the central bank can affect the real interest rate, but in the long run it is beyond the power of the central bank to smooth this (real) relative price of consumption today in terms of consumption tomorrow. Nor, in the absence of a market failure, should it want to: relative prices changes are the mechanism by which a market economy allocates resources efficiently. A central bank which targets a weighted average of the current price and the real interest rate will produce volatile inflation, as currently measured; each period's price level is used to offset swings in the real interest rate. It seems more appealing, instead, for the central bank to smooth the purchasing power of money in each period, while the market determines the relative price of consumption in different periods.

5.4.1.2.2. Can asset prices be used to predict inflation?

Should central banks at least consider asset prices because they are useful in predicting inflation? Changes in asset prices may be followed by changes in aggregate demand and inflation. There are at least two ways that this might occur. First, if equity prices rise, consumption demand may rise as households become wealthier and business investment may rise as Tobin's (marginal) q rises[55]. Second, an increase in collateralisable wealth may increase the spending of credit-constrained households and businesses.

Unfortunately, the empirical evidence on the usefulness of asset prices in predicting either output or inflation is weak. Mayes and Viren (2001) find evidence that house prices are useful in predicting future inflation and output, but stock prices are not. Goodhart and Hoffman (2000) fail to find a marginal predictive content in stock prices and Bond and Cummins (2000) found little connection between market value measures of Tobin's q and investment. Stock and Watson (2003) comment, "Some asset prices predict inflation or output growth in some countries in some periods. Which series predicts what, when, and where is difficult to predict; being a good predictor historically is largely unrelated to subsequent performance."

5.4.1.2.3. Can the central bank prick bubbles? Should it?

While we suspect that there is little enthusiasm in the economics profession for including asset prices in the central bank's price index, there may be some interest in central banks attempting to combat asset price bubbles. Cecchetti, Genberg and Wadhwani (2002), for example, argue that central banks should respond to asset price misalignments. If one could establish that a bubble exists, then there are two sensible reasons for wanting to pop it. First, bubble prices do not reflect fundamentals; hence, resources may be allocated inefficiently. Second, asset price collapses not only redistribute wealth, the resulting bankruptcies and restructurings destroy it.

Establishing that an asset price is a bubble is not easy, however. Not all explosive movements in prices are bubbles. Hyperinflations result from accelerating money growth; sticky goods prices can cause exchange rates to overshoot their equilibrium values. Thus, apparent bubbles may result from non-stationary fundamentals or a non-monotonic adjustment process.

A central bank that wants to test whether a bubble exists must first specify a model. If asset prices are not explained by the model, it could be that they are a bubble, but it might just be that the model is not specified correctly. Hamilton and Whiteman (1985) show that bubbles cannot be observationally distinguished from unobserved movements in unobserved fundamentals and even small persistent undetected movements in fundamentals can lead to huge approximation errors. Even when prices appear to be *wildly* out of line with the fundamentals, it is impossible to verify empirically whether a bubble exists. Garber (1990) even goes as far as to claim that the spectacular Dutch Tulip Mania, Mississippi Sea Bubble and South Sea Bubble were not bubbles at all.

Even if a central bank could identify a bubble, it is not clear how effective it could be at popping it. Bubbles are, by definition, deviations from the fundamentals. Thus, it does not seem obvious, that changing a fundamental would eradicate a bubble. In addition, if the central bank were to have multiple goals: meeting an inflation target and eliminating bubbles it is likely to compromise its credibility, especially since, as we have just argued, it is difficult or impossible to prove that a bubble exists.

[55] Tobin's q is the market value/replacement cost.

Past attempts by central banks to pop bubbles should provide some caution. In late 1989 the Bank of Japan responded to skyrocketing Japanese property and equity prices by tightening monetary policy with the explicit intent of bursting the bubble. It has been argued that inept anti-speculative policies by the Federal Reserve in 1928-29 were the proximate cause of the downturn in economic activity that became the Great Depression.[56]

5.4.1.3. Monetary policy and fiscal overruns: Should the Stability and Growth Pact be obeyed at all times?

The Stability and Growth Pact was added to the Maastricht Treaty at the behest of the Bundesbank, so as to extend the obligation to control public deficits and public debt from candidates to adopt the euro to members of the Monetary Union. The reason was twofold: 1) a currency's stability is in doubt if the State authorities indebt themselves to such an extent that their ability to service the debt is undermined; 2) the temptation for the smaller participants in a monetary zone of free-riding on the well-behaved members should be restrained both for reasons of fairness and of prudence.

After the European Commission applied the Pact and its sanctions to Ireland and Portugal there came an ironic twist: Germany and France failed to abide by its provisions as their Governments feared that reining in public expenditures would constrict the growth of their economies. The Pact was diluted by increasing the degrees of freedom and the time frame for the return to budget balance. This diplomatic equilibrium has been upset by the present financial crisis. The huge sums spent by the US in their economic stimulus programme have become an example of irresponsibility for European nations. One thing is to bring financial markets to full working order and quite another to expand public debt and incur budget deficits well beyond the limits of the Stability and Growth Pact. Unless international holders of euro-debt are content to keep it in their portfolios indefinitely that debt will have to be repaid with higher taxes or depreciated with higher inflation. The rules of the Pact should be obeyed and budgets be brought back to equilibrium within the stated period.

5.4.2. Considerations for times of disturbance

5.4.2.1. Central banking in financial crisis

During a financial crisis, the way in which a central bank makes monetary policy may change and a central bank's role in the provision of stable financial markets may become more important. As inflation drops toward zero or even becomes negative, possible declines in the policy rate may be limited. With sufficient counterparty risk, banks may be unwilling to lend, even when interest rates tend toward zero and the banks are flooded with liquidity. In this section, we consider alternative policy tools for central banks and the role of the central bank in restoring the market for interbank lending.

5.4.2.1.1. Quantitative Easing

A problem with a nominal interest rate as an intermediate target is that it may be difficult to have a nominal interest rate that is below zero. Thus, in periods when inflation is near zero or is negative, central banks may employ a tool referred to as *quantitative easing*.

[56] See Field (1984).

Quantitative easing refers to an expansion of the banks balance sheet brought about by an increase in base money: the central bank eases monetary policy by printing money and using the money to purchase financial assets. This tool was used by the Bank of Japan in the early 2000s in an unsuccessful attempt at tackling deflation and is currently being aggressively employed by the Federal Reserve.

When banks were the main providers of credit, financial crises manifested themselves as bank runs or liquidity squeezes, where troubled banks were unable to borrow. Central banks were expected to assist in promoting financial stability by acting as lenders of last resort: lending at a penalty rate to solvent, but illiquid, financial institutions. Now, however, that external financing is increasingly provided through the issuance of tradable financial instruments, a credit crunch can appear as dysfunctional financial markets, with little or no trade taking place in certain types of financial assets. To the extent that this reflects the market's inability or unwillingness (because of its affect on their balance sheets) to price these financial instruments, central banks may have a role to play as market makers of last resort: either by outright purchases of these assets or by accepting them as collateral (with an appropriate haircut) in repos and in loans at the discount window.

Thus, in addition to expanding the size of its balance sheet, a central bank can ease monetary policy by lowering the quality of either its assets or the collateral that it accepts in repos or for discount window borrowing. The Bank of Japan pursued such a policy in the early 2000s and it is being currently pursued by the Federal Reserve, Bank of England and the ECB.

Quantitative easing is designed to expand the money supply and hence encourage people to buy assets and spend because they do not want to hold so much money in the face of mounting potential inflation. If the banks merely hold the extra reserves and do little with them as in the case of Japan this achieves little. Quantitative easing also not the same as trying to encourage bank lending, that is done by a different route in recapitalising banks and also in trying to make the future look more secure so risks can be managed by lenders.

5.4.2.1.2. Financial Stability and Central Banks

In a severe enough financial crisis, flooding financial institutions with liquidity may not restore the market for interbank lending; in the current crisis, financial institutions borrow from the ECB and deposit the proceeds at the ECB's deposit facility, even though they make a loss on the interest rate spread. Such a complete cessation of trade in the interbank market can be a result of both fears that counterparties may become insolvent and adverse selection.

To see this, suppose that financial institutions are imperfectly informed about each others' solvency and that for a potential lending bank to be willing to lend it must set an interest rate that is sufficiently high that, given the expected likelihood of repayment, it makes a sufficient return. But, if there is enough financial turmoil that this interest rate is sufficiently high, banks that are unlikely to become solvent will not borrow. As they exit the pool of potential borrowers the interest rate that must be charged to ensure an adequate return rises further. This causes the highest quality banks that remained in the pool of potential borrowers to withdraw and the interest rate that is high enough to ensure the needed return goes up again. If the situation is severe enough, the market can vanish altogether.

In the long-run, the solution is to identify the quality of financial institutions: assets must be priced and balance sheets made transparent. In the short-run, the central bank may need to ensure counterparty risk, or even act as a universal counterparty.

Unfortunately, the central bank's role in ensuring financial stability is a political one. It decides the valuation of risky assets and the haircuts applied to them; it sets the interest rates at its discount window; it may decide who to accept as counterparties. This raises the spectre of real or perceived favouritism. While a society may allow the independence of an unelected body in the conduct of a technical task such as inflation targeting, it is less likely to allow it for political tasks. Thus, to maintain the independence of the monetary policy committee, it may be necessary to define the central bank and the monetary policy committee as separate legal entities. The monetary policy committee can be allowed independence, but the central bank – at least in its role as insurer of financial stability must be accountable.

It is also important to recognise the limitations of central banks in the provision of financial stability. In the event of a financial crisis of the magnitude of the current one, viable financial institutions need to be recapitalised. While central banks can carry out the first two tasks, they cannot carry out the third and still meet an inflation target: this must be done by national treasuries, funded by the taxpayers.

5.4.2.2. Lender of Last Resort

5.4.2.2.1. Deposit Insurance

Deposit insurance was, when first introduced, intended to be a substitute for lender of last resort action by the central bank. It now fulfils several purposes, and is seen as supplementing and complementing rather than replacing the lender of last resort role of the central bank.

Lender of last Resort evolved in England in the 19th century in response to a problem inherent to fractional reserve banking. Should a bank fail, and be unable to pay its depositors, there is a risk, and one which sometimes materialises, that depositors at other banks, seeing this hasten to their own banks to withdraw their funds. Because all banks are fractional reserve banks, it is possible in principle for other banks then to fail. It is there that the central bank acting as lender of last resort comes in – it lends on collateral to the banking system when the system as a whole is short of cash. This provision of cash calms the fears of depositors, the panic ends, and stability returns to banking. This worked in Britain in the 19th century, and also in other countries such as France, and it worked in Italy when the technique was used at the beginning of the 20th century.

It had also worked in the United States. That is why it was, and remains, a puzzle why in the 1929 panic, and in several immediately subsequent ones, the Federal Reserve did not act in this way. It did lend, but so cautiously as to give no relief to banks or their anxious customers. But be that as it may, it was feared that the Federal Reserve might again prove deficient, so among the numerous laws that followed the onset of the Great Depression in the United States, deposit insurance was introduced. The intention was that because customers would know their funds to be safe, they would not rush in panic to withdraw them, so the banking system would be more secure.

From the point of view of a modern banking system with extensive interbank lending, deposit insurance is of little use in promoting stability. The reason for this is set out below. Nonetheless, it still serves a purpose. It does ensure that retail depositors have confidence in the security of their funds. Further, it helps prevent *ad hoc* protection, the rushing after the event to compensate depositors. And perhaps most important it lets individuals use banks, a valuable social function, even though they have neither the ability nor the time to investigate and judge their soundness. It inevitably brings problems also.

With complete deposit protection, at whatever limit (or of course with no limit), there is an incentive to put funds, up to that limit, with whoever pays most interest, regardless of the riskiness of the institution concerned. But as UK experience in the Northern Rock episode showed, incomplete coverage does not seem to be politically tolerable.

5.4.2.2.2. The Discount Window

This subject leads us immediately to why deposit insurance does not prevent bank runs nowadays. The point is well illustrated by the Northern Rock episode in the UK. The run that brought down Northern Rock was not the well televised and publicised run by retail depositors. It was a run by Northern Rock's wholesale market creditors, what has been called a "silent run". Such creditors do not have the protection of deposit insurance (and rightly so – they are professional investors). For security in a fractional reserve banking system they turn to the discount window, to, in effect, classic lender of last resort. Such a run is met by the central bank discounting securities it is offered by the commercial banks. It has to choose the rate of discount, and the quality of securities it will accept. The quality is generally lowered in such an episode, one reason for the central bank's raising its interest rate. This action of course provides stability only so long as the system as a whole has enough acceptable collateral, and does not guarantee the security of all institutions. Any institutions which run out of collateral must close down. Use of the discount window in this way is thus consistent with not encouraging imprudence by bankers. It does however show the social role for deposit insurance – for if banks close, the insurance fund protects depositors.

Use of the discount window does expose the central bank to risk of capital loss. There may be none, but the risk is always there, and central banks have a small balance sheet. Accordingly, it is prudent if there is standing behind the central bank an agency which can supply capital if needed – this can nowadays, when central banks are no longer privately owned, only be the fiscal authority.

5.4.2.2.3. Widening the Balance Sheet and its effect on ECB independence

In a crisis the central bank inevitably ends up with a "wider" balance sheet. In other words, it has lowered the quality of the assets that it has accepted as collateral. This in turn poses threats to the central bank's solvency, and thus makes it more likely that it may call on its shareholder, the government, for fresh capital. Unfortunately, while necessary, this may pose some threat to the central bank's independence. Dependence on government for day-to-day finance appears as a variable weakening the independence of the central bank in studies of central bank independence, and it usually appears to be significant. There is, however, a qualification to this. In a time of crisis, the government faces tremendous costs if it does not support the central bank, and the government and central bank both know it. There is little opportunity then for the government to gain control. The widening of the balance sheet in a crisis is undesirable, but necessary, and poses no immediate threat to independence. A metaphor would be that as both parties possess the atomic bomb neither dares use it.

5.4.2.2.4. Lifeboats and the role of the Treasury

One of the best known lifeboats in the history of banking is that which rescued Baring's bank in 1890. Although Baring's was no longer a large bank, it was still one of large reputation, and it was feared that if it were allowed to fail there would be threat to London as a financial centre, and perhaps to Britain's gold reserves. That lifeboat was entirely a private sector affair; the main banks in London, and the Bank of England, all put up funds for the sake of their common good.

There have been other such episodes. But such techniques are limited now to banks which are so small that their failure would be of little practical significance. (It is possible that a bank sufficiently small to be rescued by the private sector might be so because it was crucial to the functioning of one market.) Usually, though, lifeboats inevitably involve the Treasury of the country concerned, because the institution at risk is so large that other banks coming together cannot commit enough means to support it, because they are themselves under stress, or because they do not recognise a common interest. In such interventions the central bank is highly likely to be the government's agent. This need not compromise its independence in any way, however, just as the fact that the Bank of England in 1890 co-ordinated the private sector rescue of Baring's did not compromise the Bank's independence regarding the other banks.

5.5. Summary of conclusions and proposals

The ECB clarified its two pillar strategy in 2003, so that deviations of money aggregates from a preannounced reference would not be interpreted as an effective guide of policy. The ECB now uses monetary analysis as a cross-check of the projections resulting from the economic analysis. This is a distinguishing element of ECB institutional arrangements, applied in the belief that it allows the bank to run a monetary policy consistent with a long-term price stability policy.

However, there are other institutional elements that should be clarified. After comparing the strategy of the ECB with that of other CBs, we conclude that to be more effective and predictable the ECB should make a clear move towards more transparency. Rather than changing the ECB statutes, properly based as they are on the understanding of the proper scope and limits of monetary policy, a change in day to day policy procedures would be needed and, particularly in its communication policy:

(1) In order to transmit a more comprehensive and accurate definition of price stability, current final target as measured as a small growth of the HICP should be accompanied by a review of non consumption goods and assets.

(2) The ECB should adopt a symmetrical target to avoid an inflationary drift.

(3) More detailed projections, as well as the public release of the model of reference of the ECB Governing Council used for their calculation, should be adopted to communicate the ECB's expected inflationary bias, and thus the expected path of interest rates in the medium term.

(4) Generally central banks have found that small committees are more effective for making monetary policy decisions. The Eurosystem may therefore gain by appointing a small body, based on professional competence and not nationality nor on administrative skills as with the Executive Board.

(5) The Governing Council minutes, including the voting record, should be released to foster a better understanding of the different views coming into play in the meetings. On the question of whether the names of the individual members should be identified on the voting record there was a difference of views among the authors of this Report.

(6) Without affecting its independence, the ECB should be more accountable by making the quarterly hearing of the ECB President to the European Parliament more effective and fruitful, and better focused on the questions addressed in each session.

(7) If involved in lifeboat operations, the ECB has no fiscal authority behind it, so there needs to be a mechanism for recapitalising the Eurosystem. The ECB needs to be cautious in the measures it uses to sustain financial stability so that it does not give contradictory signals for monetary policy or compromise its independence by discriminating in favour of particular financial institutions.

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Chapter 5

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