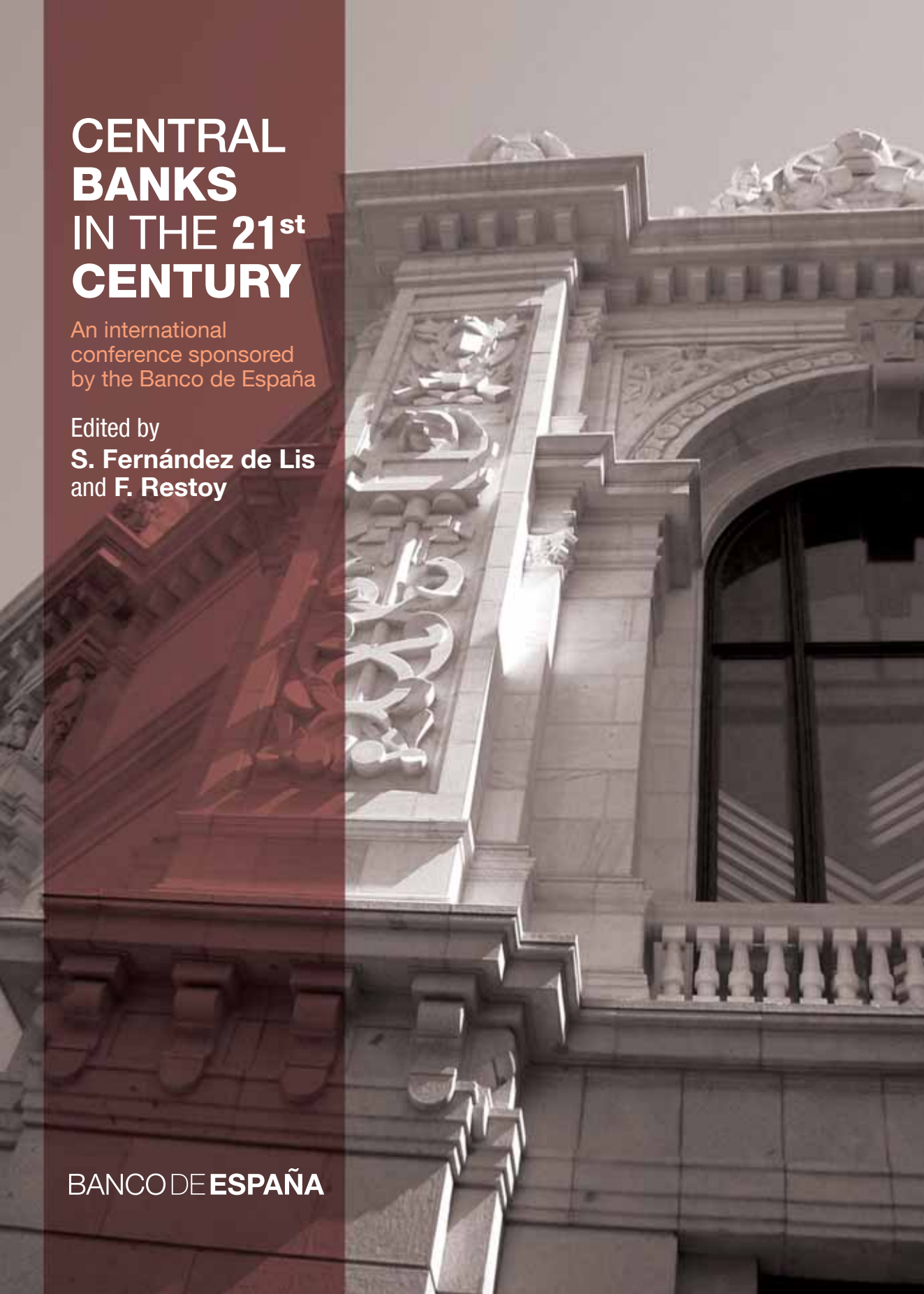
CENTRAL **BANKS** IN THE **21st CENTURY**

An international conference sponsored by the Banco de España

Edited by
S. Fernández de Lis
and **F. Restoy**



BANCO DE **ESPAÑA**

Central banks in the 21st century

Madrid, 8-9 June 2006

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Foreword

Miguel Fernández Ordóñez
Governor of the Banco de España

On 8-9 June 2006, a Conference under the heading "Central Banks in the 21st Century" was organised in Madrid to commemorate the 150th anniversary of the adoption of the name Banco de España by the Spanish Central Bank. The Conference was held under the term of office of my predecessor, Jaime Caruana, who provided firm backing for the event and followed the preparation of the programme and all related organisational work very closely.

The Conference enabled participants to discuss in depth and with a long-term perspective the main issues surrounding central banking today in the areas of monetary policy, payment systems and financial stability. A discussion on current macroeconomic imbalances and their impact on world economic trends, with particular focus on central banks' tasks, added an appropriate shorter-term perspective of present economic policy challenges to the programme.

This volume presents the Conference proceedings which, I believe, will contribute to promoting discussion and understanding of the main challenges currently facing central banks and, hopefully, to inspiring possible policy-making improvements. We appreciate the outstanding contributions of all those who participated in the symposium, helping shed light on very complex and relevant topics. Finally, let me convey my special thanks to all the staff involved in the design and organisation of the conference.

Introduction: conference summary

Santiago Fernández de Lis and Fernando Restoy[1]
Banco de España

This book contains papers and proceedings from the Conference organised on 8-9 June 2006 to celebrate the 150th anniversary of the adoption of the name Banco de España by the Spanish Central Bank. On this occasion, distinguished public officials, central bankers, academics and financial market participants met in Madrid to exchange views on the changes in the role played by central banks in the recent past and the challenges ahead in the new century. The Conference permitted participants to discuss in depth the main issues currently shaping the monetary policy debate, along with other matters of great relevance to central bankers. In particular, the programme included sessions on Payment and Security Settlement Systems and Financial Stability. Moreover, there was a panel discussion on how current macroeconomic imbalances affected the economic outlook and the extent to which this was relevant for central banks. In what follows we summarise the papers presented and the discussions held at the Conference.

Monetary Policy

In the session on monetary policy, chaired by Governor Jaime **Caruana,** Alan **Blinder** presented an issues note dealing with up to sixteen relevant questions. The paper contained what proved to be relatively uncontroversial arguments in favour of collegial monetary policy decision-making committees, the involvement of central banks in banking supervision, the gradualist approach for interest rate decisions, the need to lead rather than follow markets and other issues. The commentators, however, focused their remarks on a few questions on which they presented their own nuances or sometimes contradictory views. These mainly related to the objective function of

[1] We wish to thank all staff involved in the organisation of the conference. In particular we are grateful to Oscar Arce, María Jesús Fernández, Regina Martínez and Juan Luis Vega for their support.

central banks, the selection of core versus headline inflation as a target variable, the limits to central bank transparency and the extent to which monetary policy should take into account relevant financial developments, such as asset price bubbles.

Regarding the loss function for central banks, **Blinder** made a case for central banks becoming more transparent about their policy objectives. In that respect he set out different practical and theoretical arguments which, in his view, would advise central banks to adopt something close to a quadratic loss function in which both inflation and unemployment (or output) deviations from target would appear as arguments. He would however accept that, in a systemic crisis scenario, central banks should depart from the regular objective function and give priority to financial stability considerations.

Governor Vítor **Constâncio** expressed reservations on the proposal to ask central banks to make explicit their own loss functions. First, using results by Michael Woodford, he highlighted several theoretical points. In particular, he reminded the audience that a loss function between inflation and the output gap was only a good approximation to consumers' welfare under specific assumptions, such as the absence of frictions other than sticky prices and the presence of cost-push shocks. Moreover, he recalled the practical difficulties of deriving robust estimates of the output gap. As a consequence, he preferred central banks not to be committed to a specific loss function or to a concrete instrument rule. ECB Vicepresident Lucas **Papademos** considered that the quadratic loss function proposed by Alan Blinder did not permit a realistic description of central bankers' behaviour and introduced unnecessary constraints. In particular, he stressed that the ECB did use a hierarchical ordering of objectives – in which price stability had an overriding importance – and recalled the underlying proposition that, in general, price stability contributed to reducing output volatility.

A second issue, related to some extent to the previous one, was the use of either headline or core inflation in the definition of central bank objectives. **Blinder** presented three arguments in favour of using a core inflation measure: lack of controllability of non-core components of CPI (such as oil or unprocessed food), better predictability of the core (less volatile) components and a better contribution by core inflation targets to sensible monetary policy in the face of supply shocks. The latter point stemmed from the relatively uncontroversial fact that central banks should not react to the direct effect of adverse oil shocks on headline CPI but only to *second-round effects,* the sole effects that would be captured by the core measure.

Constâncio voiced some sympathy for Alan **Blinder**'s conceptual arguments. He added that from a welfare standpoint it made sense to ask monetary authorities to attach greater importance to developments in the more rigid components of CPI, such as services, than to components whose prices change more flexibly, such as energy, and which were typically outside standard measures of core inflation. He nevertheless contended that the use of core inflation targets entailed practi-

cal and communication difficulties outweighing the potential advantages. These difficulties were spelled out by **Papademos,** who mentioned that there were two major requirements for the choice of the policy-relevant measure of inflation: first, relevance; and second, lack of arbitrariness in its definition. He argued that core inflation measures fell short in both aspects. Moreover, he recalled that core inflation was sometimes a poor leading indicator of the relevant headline (CPI) inflation. As for policy, he considered that a medium-term orientation of central bank's actions sufficed to avoid excessive reaction to transitory supply shocks of the type described by Alan **Blinder.**

A third aspect that aroused much debate was the issue of transparency. **Blinder**'s issues note presented the very powerful arguments in favour of central banks' transparency, which support the current general consensus on this matter. He saw transparency as required to guarantee both the effectiveness of monetary policy, which clearly depended on the ability of central banks to steer expectations, and the democratic accountability of independent monetary authorities. Moreover, he paraphrased Einstein to state that *"Every central bank should be as transparent as possible, but no more so".* He saw only limitedly effective bounds to transparency and stressed that, although most central banks had considerably increased transparency in the recent past, most of them still revealed too little information on their own forecasts. In particular, he criticised the practice by most central banks of making their published forecasts conditional upon exogenous interest rate assumptions. In his view, this approach might be subject to inconsistency, lack of transparency and potential instability problems. As an alternative, he proposed formulating conditional monetary policy plans running over the regular forecasting horizon (as did the central banks of Norway and New Zealand), and publishing those plans as part of a fully consistent set of macroeconomic projections.

This latter idea was criticised by commentators who otherwise agreed with the general principles in favour of transparency. In particular, both **Constâncio** and **Papademos** remarked that projections based on market interest rates were both internally consistent and transparent. The latter speaker also mentioned that the uncertainty surrounding any prospective path for future policy rates was so great that conveying such information to the public would hardly enhance clarity. Moreover, he noted the difficulties for a collegiate policy body to agree on a concrete policy path and to convey the relevant uncertainty to the public. More importantly, he considered it would be very problematic to prevent the public from perceiving the published path as a sort of pre-commitment device and warned of the risks this perception could pose for the credibility of the central bank.

Finally, all speakers devoted a significant part of their presentations to expressing views on the implications of financial stability considerations for monetary policy actions. **Blinder** argued that central banks should have a relevant role in safeguarding financial stability. He nonetheless saw no compelling reason for

monetary authorities to include asset prices (or deviation of assets prices from fundamentals) in their objective functions and argued that the central bank was not responsible for misguided investment decisions. He also mentioned that asset bubbles could not be identified ex-ante and that even if they were, the central bank had no instruments to correct them. In these conditions, an attempt by a central bank to contain what it thought was a speculative bubble would most likely be ineffective and lead to suboptimal outcomes in terms of output and inflation. As an alternative, he defended the *mop-up strategy* under which central banks should only be ready to react as aggressively as needed – by loosening policy – if and when the bubble bursts. The approach followed by the Fed in the recent 1998-2000 stock market episode was, in his view, a successful example of how the ex-post *mop-up strategy* could suffice to avoid a serious economic downturn after a bubble burst.

Papademos argued that a *mop-up strategy,* though it might have worked well in specific episodes, was not always enough to prevent sharp reversals that potentially entailed very high costs in terms of macroeconomic stability. This provided a justification for central banks to adopt a prudent policy approach of *leaning against the wind* in certain exceptional episodes. While he would agree that bubbles were normally difficult to predict, it was relevant that episodes of abnormal asset price behaviour should tend to be associated with excessive money creation. In that connection, he stressed that although the ECB did not target asset prices, it carefully monitored capital markets and money and credit developments. That improved its ability to assess longer-term risks for price stability stemming from financial developments. **Constâncio** was also less sceptical than **Blinder** on the ability of monetary policy to respond, in specific circumstances, to exceptional financial developments. He mentioned in that regard the available evidence showing that price stability did not guarantee financial stability and emphasised that an environment with low rates and anchored inflation expectations could actually lead to excessive asset demand.

In that connection, Raghuram **Rajan** described a number of channels through which institutional investors' appetite for risk tended to be high in a low interest rate environment. He commented that, when riskless returns were not high enough, fund managers' remuneration schemes tended to make them more willing to obtain higher returns by taking up risky assets and to increase leverage. Moreover, those managers had incentives to make the extra returns look like the result of their professional ability *(alpha)* rather than the consequence of normal market remuneration of the extra *(beta)* risk undertaken. Investment in instruments (such as credit derivatives or emerging market debt) facing *tail* risk could help in that respect. Finally, he stressed that this type of behaviour spread very easily from one professional investor to another as they were typically subject to a sort of herd behaviour. All those remarks pointed, at the very least, to a potentially relevant new transmission channel of monetary policy impulses that, unlike the credit channel, did not operate through banks but through financial markets. This author also called for a careful reflection on all

possible effects of a prolonged period of low interest rates on agents' behaviour and the extent to which they could be relevant for monetary policy decision-making.

In his lecture entitled *"Activism and alertness in monetary policy",* ECB President Jean-Claude **Trichet** dealt with core issues regarding actions and communication by monetary authorities against the background of the ECB experience. He first criticised standard measures of policy *activism* based on the volatility of policy-relevant interest rates. In particular, he contended that the word *activism* was a strategic concept and should be assigned to the policy approach followed by central banks that were "constantly endeavouring to be faithful to [their] objective". Moreover, he stressed that an activist policy could be consistent with different policy paths as the concrete policy actions undertaken by an activist central bank depended very much on a number of structural and conjunctural factors, such as the size and nature of the shocks impacting the economy, the degree of price and wage rigidities, and the credibility of the price-stability objective. On that basis, he argued that the ECB's policy was not less activist than the FED in response to the economic slowdown initiated in early 2001. The smaller reduction of interest rates performed by the ECB was a logical consequence of the clearer predominance of supply shocks in Europe and the greater rigidity of the economy. In those conditions sharp policy adjustments were more likely to generate excessive output volatility. Furthermore, he recalled that the monetary accommodation went far beyond what could have been expected judging by past experiences in Europe, as the ECB was able to reduce interest rates to levels practically unprecedented in the last 50 years. This could only be accomplished in a context in which inflation expectations remained anchored at levels compatible with price stability. In this connection, **Trichet** attributed much of the success in keeping inflation expectations under control to the reputation gained by the ECB of following a "recurrent pattern of behaviour". Communication had played an important role in that respect as it helped to convey the clear message that the ECB was never pre-committed to unconditional moves but adhered to a *steady alertness* strategy which permitted policy to be permanently at the correct level to attain the price stability goal.

Payment and Securities Settlement Systems

The session on payment and securities settlement systems, chaired by ECB Executive Board Member Gertrude **Tumpel-Gugerell,** focused largely on aspects related to the prospects for financial integration in Europe framed in the ongoing developments in the global financial system.

The presentation by Anthony **Santomero** offered a comparative overview of the evolution of both retail and wholesale payment systems on both sides of the

Atlantic. **Santomero** compared first the extensive use of Giro systems and the relatively limited use of paper cheques in Europe with the opposite situation in the US, where the paper cheque was the vehicle used in half of all non-cash transactions. He explained that the discrepancy was a consequence of a number of economic and institutional factors, including the different way the banking industry was organised: while very fragmented in the US, it was dominated by a small number of large banks in most European countries. He also stressed the different role of central banks. In Europe, central banks had played a role in promoting electronic giro systems and had acted as the regulator of payment systems. In the case of the Fed, these types of functions had been combined with an active role as service provider in a context in which there had historically been restrictions on banks cooperating with each other on developing common infrastructures.

Concerning wholesale payment systems, **Santomero** indicated that the discrepancies were much smaller, as the ESCB was operating a real-time gross settlement system (TARGET) not dissimilar to FEDWIRE, created soon after the foundation of the US Federal Reserve in 1913. However, he identified a few discrepancies between infrastructures. In particular, he mentioned the different solutions given to meeting the liquidity needs of these systems. While Fedwire allowed for non-collateralised daylight overdrafts that were limited essentially by caps and self-regulation, Eurosystem central banks did not impose any quantitative restrictions but required overdrafts to be fully collateralised. In his view, however, the trend was clearly towards convergence. In the US, market forces were prompting more electronic clearing and fewer paper-based transactions. Moreover, it was very likely that Fedwire would rely more heavily on collateral – thereby resembling TARGET – in the future.

Tumpel-Gugerell gave an overview of the current situation of and challenges for the integration of payment and securities settlement systems in Europe. She summarised the steps undertaken for the integration of large-value and retail payments. The creation of TARGET initiated a process of consolidation of RTGS systems that would be further enhanced by TARGET 2, as it would provide the potential for further cost reductions. For retail payments, the Single European Payment Area (SEPA) initiative, although initiated by the private sector, had been actively supported by the Eurosystem. That project would imply the creation of standardised European payment schemes that would promote efficiency gains for end-users through a combination of better and cheaper services. She nevertheless considered that, in order to take full advantage of technological innovation, further standardisation was necessary. Moreover, what was required in her view was the enlargement of the market for payment services through more cashless transactions and the supply of value-added services to customers.

Those issues were also covered by Governor Christian **Noyer** in his intervention. Regarding wholesale payments he added a reflection on the interaction between TARGET 2 and Securities Settlement Systems. He raised the question of

whether TARGET 2 should support a wide range of interaction models to foster competition between systems or should instead limit the interaction models to only one in the long run. He stressed that in the latter case the Eurosystem could only select the most efficient interaction model. As regarded retail payments, he highlighted the uncertainty surrounding the future structure of the retail payment industry, which ranged from a single infrastructure operating as a natural monopoly to competition between several systems. He also found it important to strike the right balance between encouraging the adaptation of payment systems to technological innovation and ensuring the safety of payments. Moreover, **Noyer** considered it necessary to strengthen business continuity requirements, and identified two challenges in that regard: to respect cost-efficiency and to seek consistency between different relevant regulations. He finally dealt with the role of the Eurosystem in this field. He recalled that the European central banks were payment service providers, facilitators of market and regulatory developments, and overseers, and stated that there was scope for further involvement in all three aspects.

In the field of securities settlement, **Tumpel-Gugerell** referred in her introductory remarks to the need for an integrated infrastructure. At the same time, she considered that the process in that direction was slow but continuous. She highlighted in that regard the arrangements for cross-border use of collateral in the Eurosystem and the reduction in the number of central counterparties and central securities depositaries. Furthermore, she argued against a single model for achieving integration. Rather, she embraced the concept of interoperability that encompassed the concept of vertical and horizontal integration and required the cooperation of all private and public interested players. Finally, **Tumpel-Gugerell** considered that although the integration process should be market-driven, authorities had a role to play. She said that this role was on one hand to correct market failures and on the other to remove legal and fiscal barriers to integration.

Alberto **Giovannini** expanded on this set of issues. He remarked that an EU financial system was not currently in place. Although there was no prohibition on trading between EU Member States, there were significant impediments and costs to cross-border financial transactions. The latter were reflected in different technical standards, market conventions, rules and regulations that were country-specific. The impediments were particularly severe in security clearing and settlement, where national monopoly structures remained. He considered that in that area maximum consolidation was justified as a means of taking full advantage of economies of scale. Moreover, in his view consolidation also helped mitigate systemic risks, since the impact of the failure of a single entity within an infrastructure would be smaller as the volume operated through that system increased.

Giovannini agreed with **Tumpel-Gugerell** that the reform strategy should involve both the public and the private sectors. However, he underlined that this approach involved a complex strategic interaction between both. Although he ac-

knowledged that there had been relevant practical initiatives to remove obstacles to integration, he criticised the lack of boldness by public authorities in providing the appropriate legal and regulatory framework for European post-trading. **Giovannini** warned that this might have also slowed down the reform of standards and conventions to be undertaken by the private sector. Moreover, he noted that the focus had so far been the development of a *framework* to eliminate barriers to cross-border clearing and settlement. Little attention had however been devoted so far, in his view, to the structure of the industry *(arquitecture)*. In particular, he saw a risk that the consolidation process might ultimately generate a socially-suboptimal pan-European natural private monopoly and called, therefore, for regulators to monitor the process carefully.

The regulatory issues attracted much attention in the general discussion:

- Governor Erkki **Liikanen** enquired about the possibility of using regulation to contain the natural tendency of monopolistic competitors to inflate the price of essential services by bundling them with other services more open to competition. **Giovannini** argued that bundling practices might not necessarily run against the interest of consumers, since the joint production and distribution of several services could yield synergies too. He noted that a pricing system conducive to more transparency could be achieved by requiring firms to offer the bundled services separately, as well. Under such an arrangement consumers could readily verify whether the price of the bundle reflected any underlying synergy or, on the contrary, a distortional monopolistic premium. He reasoned, however, that the centrepiece of the debate should first be the existing obstacles to stronger integration of clearing and settlement systems in the EU, an issue which, in his view, merited more interest than that so far received.
- There were also questions on whether there should be a role for the public sector in providing some services within an efficient EU-wide payment and settlement system. **Giovannini** argued that those core functions, which were necessary for the general sound functioning of the system but were not subject to strong technological innovation, might be performed by public agencies. As for other activities with larger scope for innovation, he recommended a stronger role for private participation. In order to avoid a socially suboptimal industrial structure, he proposed implementing a system of managerial incentives that placed special emphasis on cost minimisation rather than profit maximisation. This proposal could be put into practice by giving room to users in the system's governance boards.
- Reflecting on **Giovannini**'s proposal for a distinction between functions with low and high technological content, **Santomero** voiced his scepticism about the precise criteria to be followed in practice, and he argued that vir-

tually every single structure in the sector was subject to the dynamics of technological change. From that perspective, he maintained that it might not be possible to draw a line separating those functions within the system that should be undertaken by public entities and others that should be kept open to competitive forces. **Noyer** agreed with **Santomero** and offered the example of the French large-payments system as a real instance in which two different structures, one public and another private, coexisted. He also emphasised that the worst possible scenario for the general interest would be one in which a single profit-maximising entity prevailed.

Global Imbalances

The session on global imbalances was chaired by the ECB Executive Board member José Manuel **Gonzalez-Páramo.** Participants in the round table agreed that the size of these imbalances was unprecedented and exchanged views on the explanatory factors, the likely sustainability and persistence of the disequilibria, the need for a policy adjustment – and the types of policies needed in different regions – and the possible role of central banks in that regard.

A number of factors were mentioned as contributing to explain current account imbalances among the major economies: low saving in the US, both public and private, the latter possibly linked to high asset prices (a point emphasised in particular by David **Folkerts-Landau**) and/or excessive saving in China plus insufficient investment in other emerging countries in Asia (**Gonzalez-Páramo**). Vincent **Reinhart** observed that in some circumstances strong productivity gains might be related to substantial current account deficits, a point also mentioned by Governor Axel **Weber.** Most speakers referred to the role exchange rate policies in Asian countries (in particular China) were playing in maintaining and amplifying external imbalances, by preventing the adjustment of real exchange rates. It was also mentioned in this regard, however, that in the Chinese case the question of exchange rate flexibility could not be analysed in isolation, and that it was especially important to look at these issues in the context of the sequence of capital account liberalisation and the need to strengthen the soundness of the banking system.

Most participants agreed that current global imbalances were hardly sustainable. Only **Folkerts-Landau** expressed the view that the present configuration of imbalances was certainly unstable, but perhaps sustainable, to the extent that it reflected a certain equilibrium among key global players in the so-called Bretton-Woods II system. In that regard, present imbalances were a result of profound changes in the global economy over recent years (especially the integration of China), and did not reflect in his view an over-reaction of financial markets, and nor did they necessarily point to inappropriate economic policies in key coun-

tries. In particular, excessive emphasis on the need for an exchange rate appreciation in China might be risky insofar as such an adjustment might have negative repercussions on the domestic financial system, which was not yet robust enough to absorb such an adjustment. **Weber** stressed, however, that there were inherent risks and costs of reserve accumulation that needed to be taken into account when evaluating the functioning of the Bretton Woods II paradigm.

Governor Vittorio **Corbo** said there were two scenarios of correction, namely a hard landing and a soft landing scenario. Although the probability of the latter was higher than that of the former, the risks attached to the low-probability, high-risk scenario merited careful monitoring by the authorities.

Although there was considerable consensus around the idea that present imbalances were unsustainable, **Weber** expressed the view that they could persist longer than commonly thought, a view that gathered considerable support around the table. Among the reasons for this persistence, that most widely mentioned was the possibility of a reduction in home bias (the trend to accumulate domestic assets in excess of what would have been rational from an efficient portfolio allocation viewpoint), as a result of the globalisation process. Several speakers referred to the increasing empirical evidence of such a decrease in home bias. **Gonzalez-Páramo** mentioned that, according to ongoing empirical research at the ECB, this decrease was particularly strong for euro area member countries, whose level of home bias was also lower (around 65%) than in the US. **Reinhart** also stressed that the relevant variable was relative home bias as compared to other countries or regions rather than its absolute value. He also mentioned that valuation effects might offset the impact of exchange rate changes and that the impact of the latter, in the case of the US, might be more than offset by changes in the opposite direction of real growth in the rest of the world and therefore of net external demand for US products.

There was also considerable consensus on the need for policy adjustments to provide for a gradual correction of global imbalances, an objective that all speakers saw as desirable. In the view of **Corbo,** the solution would involve many players that would need coordinating, but national policies would in any case have to be strengthened to face a world of growing uncertainty.

In the area of policy adjustments, most speakers mentioned the need for an increase in public and private saving in the US, together with structural reforms to enhance the flexibility of the European and Japanese economies. Other elements of a package of policies to address global imbalances mentioned in the round table were: an increase in investment in East Asia (other than China), which remained at abnormally low levels since the Asian crisis in the mid-nineties; an improvement in the absorption capacity of oil-exporting countries, to increase the re-spending of their extra revenue as a result of recent increases in oil prices; and increased exchange rate flexibility and financial sector reforms in most emerging Asian economies.

Corbo addressed the particular case of Latin American countries, which in his view were playing a negligible role in financing the external US current account. He acknowledged that Latin American countries had made in general considerable progress in reducing their vulnerability over recent years, by improving their fiscal and monetary policy frameworks, reducing their debt levels and improving the structure of their debt and their current account positions, as well as the soundness of their financial systems. Despite this progress, countries with closer ties to the US and/or with a relatively high level of debt were in his view still vulnerable to a hard landing scenario.

What is the role of central banks in addressing global imbalances? As concerns monetary policy, **Gonzalez-Páramo** and **Folkerts-Landau** stressed that the best contribution central banks could make was to maintain low and stable inflation rates. Beyond this, **Folkerts-Landau** saw a role for central banks to use moral suasion for a gradual adjustment of real exchange rate levels where needed. Several speakers addressed the issue of whether central banks should have a role in addressing asset market bubbles or misalignments (some of which were apparently playing a role in global imbalances), a topic previously discussed in the session on monetary policy. The consensus view was that it was extremely difficult to envisage a situation in which monetary policy needed to react to movements in asset prices over and above their impact on traditional measures of inflation. **Folkerts-Landau** emphasised in this regard that sectoral imbalances were very difficult to address through monetary policy measures. In the same vein, **Reinhart** stressed that monetary policy should not pay attention to relative prices, or to asset prices per se.

There was also considerable consensus on the importance of the role central banks should play in maintaining financial stability and a soundly functioning infrastructure of financial markets, in particular in a situation in which global imbalances – and their correction – posed certain risks of stress for particular segments of global financial markets.

The general discussion and the subsequent replies by roundtable participants raised a number of interesting issues, including most notably the following:

– Whereas an increase in US savings seemed to be an ingredient in any policy adjustment scenario, it was less clear which component (public or private) should make the main contribution to the adjustment. Steve **Cecchetti** argued that it was extremely unlikely that private savings would adjust unless there were a dramatic change in the US housing market, whose strength explained the weakness of private saving, via wealth effects. According to this view, only fiscal policy could increase US saving. Vincent **Reinhart** agreed that private saving rates would increase only to the extent that there were an adjustment in asset prices.

- The question of the link between global imbalances and the low level of real interest rates was mentioned by Alberto **Giovannini.** There was consensus that we knew relatively little on the link between both features of the recent economic performance, and that further analysis was needed.
- The attractiveness of US capital markets as a magnet for the savings of the rest of the world was mentioned by Alan **Blinder.** Insofar as global imbalances were a two-sided phenomenon, policy prescriptions should not neglect the capital account side, a corollary of which was that Europe and Japan, in particular, should do more to attract capital from abroad.
- China's exchange rate policy was seen by some participants as part of a strategy to foster growth and exit from an underdevelopment situation, a strategy that required some understanding on the part of industrial countries. Other participants mentioned however that the strategy harmed most other developing countries competing with Chinese products in third markets and whose exchange rate was flexible and market-determined.

Financial Stability

In the session on financial stability – chaired by Governor Erkki **Liikanen** – Frederic **Mishkin** presented an issues note focused basically of how emerging economies could best harness the benefits of globalisation while avoiding its risks. In his presentation he highlighted the crucial role played by developing appropriate institutions, in particular the need for (i) strong property rights and legal system, (ii) fighting corruption, (iii) improving transparency and corporate governance and (iv) avoiding government participation in direct credit.

Mishkin described how globalisation promoted financial development, by fostering liberalisation and opening up to foreign financial institutions, which increased competition, improved the financial system infrastructure, introduced best practices, increased the efficiency of the financial sector and reduced the cost of capital. In Malcolm **Knight**'s words, globalisation was "a vital catalyst for implementing domestic structural reforms".

Nevertheless, **Mishkin** also acknowledged that there was a "dark side" to financial globalisation, as highlighted by the fact that the source of a number of recent banking and currency crises had been earlier process of liberalisation which, via a lending boom and surging capital inflows – and in the presence of typically weak supervisory frameworks – had led to financial instability. Governor Erkki **Likkanen** and Governor Guillermo **Ortiz** confirmed that most of the elements described in that part of the issues note were present in their respective experiences of banking crises in Finland and Mexico. The question therefore was which policies were most likely to ensure that countries fully exploited the benefits of globalisation while

minimising the risk of crisis. **Mishkin** presented a comprehensive list of prudential regulation and supervisory measures and policies aimed at that objective.

The measures included limiting currency mismatches in the balance sheet of financial intermediaries; avoiding deposit insurance in the absence of proper institutions to limit moral hazard; restricting connected lending and the ownership of banks by commercial enterprises; ensuring that banks had sufficient capital; focusing on risk management and encouraging disclosure and market-based discipline. Other speakers generally agreed with this list of policy objectives, but qualified certain aspects. **Likkanen** warned that the absence of explicit deposit insurance could be equivalent in some emerging market economies to an implicit blanket guarantee of deposits which might be even worse from a moral hazard point of view. **Ortiz** agreed on the emphasis on disclosure and expressed his view that the listing on domestic stock exchanges of systemically important subsidiaries of global banks would help ensure appropriate market-based discipline.

One recommendation that triggered a substantial debate among participants was to facilitate the entry of foreign banks into the domestic banking system. **Mishkin** mentioned a series of advantages related to foreign banks' participation: a greater diversification of portfolios, more access to resources, less vulnerability to domestic shocks (and, as a corollary, a smaller incidence of crises, as shown by empirical evidence), better management and risk control mechanisms, and less probability and expectation of a bail-out in the event of a crisis. There was consensus among speakers on the advantages of foreign banks' participation, but a few questions were asked in that regard. **Likkanen** raised issues related to cross-border responsibility in supervisory policies and crisis management in the European context. The EU setting relied on two features – the principle of home-country control and the distinction between branches and subsidiaries – which, in his view, were increasingly difficult to implement due to the rapid increase in cross-border activity and the trend towards a relative growth of branches as opposed to subsidiaries. The problem, in his view, affected particularly the case of foreign banks systemically relevant in the host country, especially in the case of branches. He noted that Europe was increasing supervisory co-ordination to address these issues, without for the time being considering a change in the model, although alternative models might be considered in the medium to long term.

Ortiz remarked that banking efficiency improved notably in Mexico after the entry of foreign banks. To ensure, however, the benefits of globalisation, it was in his view necessary to improve competition. He mentioned that subsidiaries were managed by global banks like branches, a trend that posed problems for host country regulators and supervisors. He also expressed doubts on how consolidated supervision was treated in Basel II, in particular as concerned risk in domestic currency vis-à-vis the sovereign issuer in the host country, which should be based on external or internal ratings, implying an increase in the financing costs of host

countries' sovereign debtors. To improve market discipline he also suggested that minority shareholders should have a seat on subsidiaries' boards.

There arose from **Mishkin**'s paper a series of questions as a result of the principal-agent problem inherent to financial regulation and supervision. In his view, to make prudential supervision work it was necessary (i) to ensure prompt corrective action when problems arose; (ii) to limit the perception of a policy of "too-big-to-fail", by means of which institutions of a certain size were expected to be bailed out by the government in the event of problems; and (iii) to provide resources, authority and a sufficient degree of independence (and the corresponding accountability) to regulators and supervisors.

A question which aroused considerable debate was the appropriate degree of discretion in supervisory policies in emerging market economies. **Mishkin** warned that an excessive degree of discretion might backfire against supervisors in the absence of a strong institutional and legal framework. He expressed in this regard some concern on the application of Basel II (in particular its second pillar) in these countries, which might not be appropriate at that particular point, since in his view it was better with a weak institutional environment to encourage market discipline rather than the discretionary power of the supervisors. Other participants regarded this question as a matter of proper sequencing. Malcolm **Knight** agreed that emerging market economies should adopt Basel II "only when ready", whereas **Likkanen** remarked that they could move gradually to a more flexible and risk-based approach.

One question that gave rise to much debate was the right sequencing between financial liberalisation and the creation of an appropriate institutional structure of the financial system. In the issues note **Mishkin** argued that the latter should be in place before financial liberalisation, but acknowledged that the incentives for reform mostly arose after liberalisation which, according to **Knight,** raised a dilemma which could not be answered with a single formula, the solution being country-specific.

Mishkin outlined in his presentation a series of recommendations concerning macro and structural policies. In his view a prudent fiscal policy, a monetary policy oriented towards the objective of price stability and implemented by an independent central bank, a floating exchange rate regime and openness to international trade were all ingredients that facilitated the task of fully exploiting the benefits of financial globalisation while reducing the risks. Concerning monetary policy, **Knight** emphasised the need to look further than the relatively short horizons of most inflation target frameworks and to pay attention to longer-term trends in liquidity and asset prices, which in the present environment of low inflation would imply avoiding complacency.

Likkanen stressed that the choice of the exchange rate regime depended on many factors, but that we should not exclude a priori that certain exchange rate pegs might prove to be an appropriate monetary strategy in some countries. He

also raised the issue of the different nature of crises and the likelihood that the following one would contain new elements: market instability, the existence of systemic non-bank financial institutions, the increasing importance of liquidity and contagion in market transmission and the internationalisation of institutions and markets were mentioned as elements that might shape financial crises in the future.

In the final part of his issues note, **Mishkin** considered what industrial countries could do to ease emerging market economies' integration into the global economy. He concluded that opening up their markets to goods and services from emerging market economies was the main contribution advanced countries could make in that connection.

In the general discussion and the subsequent replies by speakers, a number of interesting issues were raised:

- Vittorio **Corbo** emphasised the need for parallel progress in trade and financial liberalisation, a view that was shared by other participants.
- Jaime **Caruana** expressed the view that Basel II was superior to Basel I even for emerging market economies, as it was more risk-sensitive. On the issue of whether it would require a more stringent treatment of sovereign debt issued in foreign currency for some emerging markets, he stressed that this treatment would in principle be more correct than the present one. He also mentioned that it was normal that global institutions should have a global view of risks, and that that should be compatible with adaptation to the local market. He also expressed a view in favour of transparency rules for subsidiaries, but only insofar as they did not run against property rights.
- **Richard Portes** raised the question of who would bear the costs in the event of an insolvency in a global institution and expressed the view that Memoranda of Understanding between supervisors did not normally address this issue with sufficient clarity, an opinion that was shared by other speakers. **President Trichet** referred to the specific case of the Eurozone and mentioned that its case was not so different than at the national level, where in general there were no strict, codified rules for crisis resolution. In his view similar arrangements were perfectly feasible in the euro area, without any need for further clarification.

Conclusions

Vicepresident Pedro **Solbes** focused his concluding remarks on two of the main topics of the Conference: financial stability and global imbalances. He first reflected on how the interest of supervisors had somewhat shifted focus from the analysis of individual institutions to a more broad macro-based approach. He

linked this to the identification of potential risks for the financial system arising from the combination of expansive macroeconomic developments and herd behaviour by market participants.

At the same time, **Solbes** warned against simplistic analysis linking asset price increases and debt accumulation to imbalances that could merit economic policy action. He mentioned the example of the European monetary union which was, for countries like Spain, a structural shock justifying higher values for productive assets and a higher propensity to borrow as a consequence of rational behaviour by economic agents. He nonetheless stressed the importance of containing the influence of amplifying factors such as unduly expansionary fiscal policy or malfunctioning labour markets. Those factors could actually dampen the economy's ability to absorb smoothly the expansionary impact of shocks such as those generated by the monetary union.

As for global imbalances, **Solbes** dealt first with the origin of current account disequilibria. He saw that while surpluses generated in oil-exporting countries were a rational intertemporal response, that might not always be the case in developing countries with a net saving position. As the latter were now foregoing consumption to finance that of richer countries, the reasonableness of those imbalances was at least debatable, as were the current exchange rate policies of surplus countries and the fiscal policies in the US.

He recalled the risk of imbalances leading to the disorderly correction of exchange rates. At the same time, he considered as heartening the emerging consensus that currency stability was a public good whose preservation required joint action under a cooperative approach.

He finally remarked on the limits of standard policy tools. In particular, he saw a risk of focusing the debate excessively on exchange rates, as this could encourage protectionism and act as a distraction on other policy fronts. Moreover, standard demand policies were of little effect when imbalances were linked to structural problems that inhibited consumption or investment in surplus countries.

In his concluding intervention, Governor Jaime **Caruana** commented on the changes observed in the global financial system and on how these had affected the role played by central banks. In his view the process of financial development and liberalisation worldwide had increased the possibilities of risk-sharing among agents and enhanced the ability of private agents to make efficient intertemporal decisions, thereby increasing social welfare. At the same time, those developments had meant new challenges for monetary and supervisory authorities. For central banks, after years of broad success in delivering low inflation, the process of financial deepening had increased the complexity of the relationship between prices and financial stability. For **Caruana,** a long period of monetary stability coupled with low interest rates could arguably be conducive to certain types of financial imbalances, sometimes generated by excessive risk-taking by economic agents, which could eventually threaten the stability of the whole system.

Caruana agreed that the ex-ante identification of episodes of systemic financial distress was not an easy task and that, in advanced economies, they occurred typically with low probability. Still, if the likely consequences of those extreme episodes were sufficiently adverse, in his view the central bank could in very specific circumstances depart from its regular reaction function to consider actions aimed at reducing the risks entailed. He also contended that prudential policies could do much to promote the resilience of the financial system. That involved the design of regulatory and supervisory frameworks aimed at promoting appropriate risk assessment by providing the right incentives to individual institutions. Arguably, that included a better understanding of how risks evolved along the business cycle. He mentioned in that connection the New Capital Accord (Basel II), and underlined how this framework provided more risk-sensitive capital requirements and promoted transparency. The latter would help minimise the problems of information asymmetry between lenders, borrowers and authorities that had been at the root of recent financial crises.

Caruana also referred to the specific challenges faced by central banks within the EMU. He stressed, specifically, those related to the heterogeneity of the single currency area in terms of shock exposure, domestic policies and allocation mechanisms. In addition, he mentioned the steps that still had to be taken to build a fully integrated market for financial services and emphasised its relationship to the effective functioning of monetary policy. The Eurosystem had responded to the analytical challenges posed by cross-country diversity by paying due attention to the analysis of national economies when assessing the economic situation and the prospects for price stability for the euro zone as a whole. Moreover, it had been an active player in promoting higher financial integration – e.g. with the creation of TARGET – and had supported public or private initiatives aimed at removing barriers to cross-border financial transactions. He expected the Eurosystem to further strengthen its current policy approach in both areas in the future.

Caruana concluded his intervention stating that recent developments on the financial landscape and the closer interaction between financial and macroeconomic stability had made the work of central banks much more complex but also more relevant.

Monetary Policy

Monetary policy today: sixteen questions and about twelve answers

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> There have been three great inventions since the beginning of time: fire, the wheel, and central banking,
>
> – Will Rogers

> Victorians heard with grave attention that the Bank Rate had been raised. They did not know what it meant. But they knew that it was an act of extreme wisdom.
>
> – John Kenneth Galbraith

My assignment is to survey the *main* questions swirling around monetary *policy today.* I emphasize three words in this sentence, each for a different reason. "Main" is because one person's side issue is another's main issue. So I had to be both selective and judgmental in compiling my list, else this paper would have been even longer than it is. "Policy" indicates that I have restricted myself to issues that are truly relevant to real-world policymakers, thus omitting many interesting but purely academic issues. "Today" means that I focus on current issues, thus passing over some illustrious past issues. All these omissions still leave a rather long list; so I will have to treat some issues quite briefly.

I have compiled a list like this once before. In December 1999, at what I believe was the first conference ever organized by the brand-new European Central Bank (ECB) in Frankfurt, I offered (over dinner, no less!) a list of 15 questions that would have to be answered by anyone starting a central bank from scratch

[1] I am grateful to Gavin Bingham, Stephen Cecchetti, Vitor Constancio, Alex Cukierman, Lucas Papademos, Ricardo Reis, and Lars Svensson for helpful suggestions, and to Princeton's Center for Economic Policy Studies for research support.

at the time (Blinder, 2000). In this paper, I will declare two of my 15 Frankfurt issues largely resolved, and note that two others have dropped off the radar screen without being resolved. However, I will add five new issues. Thus the list of issues has grown longer, not shorter, since 1999. But do not mistake that for lack of progress. Both the art and science of monetary policy have advanced considerably since then.

Before proceeding further, let me mention some issues that I will *not* take up, for their omission is, in some sense, a measure of that progress. My Frankfurt list included the old debate over the choice between interest-rate targets and monetary-aggregate targets, which seems to have been resolved everywhere except in the ECB's rhetoric. It also included the issue of whether electronic money poses a threat to central banks, which was a hot issue then but seems to have faded from view.[2] Earlier discussions of central banking issues devoted a great deal of attention to the need for central bank independence.[3] But that debate is all but over, and I will simply *assume* that the central bank is independent.[4] Similarly, some earlier authors thought it necessary to defend the proposition that low inflation is a central goal of monetary policy, a proposition that no longer needs defense.[5] In addition, a huge amount of ink has been spilled on the time consistency debate and the so-called inflation bias[6] – another debate that I consider to be over, although others may disagree.

What, then, will I discuss? Part I, the longest part of the paper, takes up five critical questions regarding the *institutional design* of the monetary policy authority:

1 What is the proper objective function for monetary policy?
2 How transparent should the central bank be?
3 Should the central bank be an inflation targeter, as that term is commonly used nowadays?
4 Should monetary policy decisions be made by a single individual or by a committee – and, if the latter, what type of committee?
5 Should the central bank also regulate and/or supervise banks?

After that, I turn in Part II to *operating principles* for monetary policy, discussing six issues:

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[2] See, for example, the papers by Charles Goodhart, Charles Friedman, and Michael Woodford in the July 2000 special issue of the journal *International Finance.*

[3] See, for example, Fischer (1994).

[4] However, there are those who worry about fiscal dominance and/or budgetary independence of the central bank.

[5] Again, see Fischer (1994). However, the issue of whether monetary policy should target the *inflation rate* or the *price level* remains a live one. See Issue 15 below.

[6] The original sources were Kydland and Prescott (1977) and Barro and Gordon (1983).

6 Is the observed proclivity of central bankers to avoid policy reversals justifiable?
7 Does the revealed preference of central bankers for gradualism make sense?
8 Is "fine tuning" possible after all? And if so, should central bankers attempt to fine tune their economies?
9 Should central banks lead or follow the financial markets?
10 Should central banks in floating exchange rate regimes intervene in the foreign-exchange market?
11 Should central banks use derivatives in the conduct of monetary policy?

Finally, I briefly discuss five issues pertaining to the *transmission mechanism* for monetary policy in Part III:

12 Transmission through the term structure of interest rates
13 Transmission through the exchange rate
14 How should the central bank deal with asset-market bubbles?
15 How should the central bank deal with the zero lower bound on nominal interest rates?
16 Do the world's giant central banks have global responsibilities?

I The design and structure of the central bank

The first set of five issues pertains to how central banks should be designed and organized – to their "constitutions," so to speak.

Issue 1: What is the proper objective function for monetary policy?

My jumping-off point for this discussion is the loss function that has become ubiquitous in academic writings on monetary policy:

$$L = (\pi - \pi^*)^2 + \lambda(y - y^*)^2 \text{ or} \tag{1a}$$

$$L = (\pi - \pi^*)^2 + \lambda(u - u^*)^2, \tag{1b}$$

where L is the period loss, π is the inflation rate and π^* its target value, y is real output and y^* its "natural" or "equilibrium" or "potential" value, and u is the unemployment rate and u^* is the NAIRU. Two variants are given because some authors prefer to represent the central bank's real economic activity objective by the

output gap while others prefer the unemployment gap. I will return to this choice briefly below; but, for the most part, it is immaterial.

Nowadays, the live argument is over the size of λ, with some authors fretting that it not be set too large. It thus seems almost quaint to recall that Fischer (1994) went to great lengths to argue that $(\pi - \pi^*)^2$ should figure prominently in the loss functions of central banks – that is, that $\lambda < \infty$. No one needs to make that argument today.

Making (1) operational, even in a metaphorical sense, requires that the central bank choose three parameters: λ, π^*, and either y^* or u^*. Each raises important practical issues.

Let us start with π^*, where two main issues arise. The first is obvious and has been so extensively discussed that I will treat it briefly: What's the number? A consensus of sorts seems to have developed around an inflation target of 2% or so for advanced, industrial countries. Berg (2005) surveyed practices at 20 inflation-targeting central banks, eight of which are from rich countries, and every one of the eight uses either 2% or 2.5% as the midpoint of its target range. The ECB, of course, targets inflation "below, but close to, 2%," and the Federal Reserve's all-but-announced target is similar.[7] At 2% inflation, the price level doubles every 35 years. Why not set the target lower? The two main arguments are (a) that price indexes are biased upward and (b) that π^* should be set high enough to provide a reasonable cushion against deflation (see Issue 15 below). Neither seems controversial nowadays, so I move on to a question that is: What measure of inflation should be used?

One important choice is whether inflation should be measured by a "headline" or "core" concept,[8] that is, should it include or exclude energy prices?[9] I am firmly in the "core" camp for three related reasons. First, monetary policy is unlikely to have much leverage over energy (or food) prices; so it makes sense to focus the central bank's attention on the inflation it can actually do something about. Second, even if the bank's true concern is headline inflation – which is, after all, the inflation that consumers actually experience – it can probably forecast future headline inflation better by using current and lagged values of core inflation. Ricardo Reis and I (2005)

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[7] The Fed's preferred index of consumer prices is not the CPI, but rather the deflator for core personal consumption expenditures in the national income and product accounts, which normally runs below the core CPI measure. In its February 2006 monetary policy report, the FOMC implicitly set its target for core PCE inflation at 1.75-2%.

[8] This is not the only issue. For example, Mankiw and Reis (2003) argue for using wage increases rather than price increases. Strum (2006) argues for a PPI measure rather than a CPI measure. Reis (2005) explores the role of asset prices in the price index. Yet another issue is whether monetary policy should target inflation (the usual choice) or the price level. This last question is dealt with briefly under Issue 15 below.

[9] In most countries, "core" inflation also excludes food prices. (In Japan, the core consumer price index excludes fresh food but includes energy products.) However, food prices have not been an issue for more than 30 years, so I concentrate on energy.

demonstrate this conclusion statistically for the United States, and I suspect it holds in many countries. Third, I believe that concentrating on core inflation is likely to produce more sensible monetary policy in the face of oil shocks (see below).

Despite these powerful arguments, virtually all central banks and governments have opted for headline over core. The ECB, of course, is the most prominent example in this part of the world. But Berg's (2005) list shows that 18 of the 20 inflation-targeting central banks use a headline concept of inflation.

If the choice is controversial, it must be because of the third reason given earlier: the response to supply shocks. So let me briefly defend my position.[10] Consider, first, the case that is dominant in the data: a supply shock that raises the relative price of oil *temporarily.* In that case, oil prices are a source of *inflation* as they rise, but subsequently become a source of deflation as they fall – which happens automatically, with no need for central bank action. Given the long lags from monetary policy to inflation, there is essentially nothing the central bank can do to remove this bit of inflation volatility.

The other empirically relevant case is when oil prices rise to *permanently* higher levels. Then oil prices are an engine of inflation, but one that naturally peters out unless "second-round effects" on *core* inflation are large. The recent evidence suggests only minor second-round effects, perhaps due to central banks' greater determination to stop inflation in the 1990s and in this decade as compared to the 1970s (Hooker, 2002). Why? The presumed answer is better anchoring of inflationary expectations (Bernanke, 2006). In any case, returning to the main question, there is little that monetary policy can or should do to limit the "first-round effects" of an oil shock. For example, targeting *headline* inflation during a period of rising (falling) oil prices might make monetary policy excessively tight (loose). Hence my conclusion: Stick to core inflation.

The choice of a full-employment target (y^* or u^*) also merits some discussion. Let me first assume that the target is y^*, and then consider whether u^* might be the better choice.

The empirical literature contains at least three distinct ways to estimate y^*. The oldest is *potential GDP,* which can be defined as:

$$y^* = AF(L^*(1-u^*), K), \tag{2}$$

where F(.) is the aggregate production function, A is the Solow residual (in levels), L^* is the full-employment labor force (so $L^*(1-u^*)$ is the "natural" level of employment), and K is the capital stock. A second concept – which is closely related in principle, but is estimated very differently in practice – is the *natural rate* of output, defined as the level of production (= aggregate demand) at which

[10] I have dealt with this topic in more detail in Blinder and Reis (2005), especially pages 41-45.

the price level is neither accelerating nor decelerating. It is often "backed out" of an estimated Phillips curve using Okun's law, thereby making no direct use of time series data on either K or L (not to mention A). A third approach is to define y* as the "trend," which is then estimated in some mechanical way (e.g., by a Hodrick-Prescott filter).

In the context of an objective function like (1), which trades off output volatility against inflation volatility, the natural rate of output derived from a Phillips-curve framework (the second of the three concepts above) seems to be a sensible working definition of y*. Often, the empirical procedure begins with an estimate of u* from a statistical Phillips curve. Needless to say, that number cannot be known with precision. Most European countries, in fact, never had a widely-accepted estimate of the NAIRU; and the days when a 6% NAIRU was a consensus choice in the United States are long gone. So, at a minimum, estimates of u* must be treated as time-varying and having large standard errors (Staiger, Stock, and Watson, 2001).

Notice that, while academics seem to have a revealed preference for output gaps over unemployment gaps, a second empirical step is needed to move from the latter to the former – which adds an additional element of statistical uncertainty. That element is productivity, which translates labor input into output. At times when projecting (or even estimating) productivity is difficult, estimating the path of y* becomes extremely hazardous.[11] For this very practical reason, I have a mild preference for using an unemployment-gap concept rather than an output-gap concept. But I do not want to exaggerate the strength of this preference. As Blinder and Yellen (2001) and others have noted, an *unrecognized* acceleration (deceleration) of productivity growth can temporarily depress (raise) the NAIRU.

The next issue is the choice of the weight λ in (1). A higher value of λ connotes more concern with output or unemployment gaps, relative to inflation gaps, and vice-versa. It is tempting to identify λ with the coefficients α and β in a Taylor rule:

$$i = r^* + \pi + \alpha(\pi - \pi^*) + \beta(u^* - u), \tag{3}$$

where i is the nominal interest rate and r^* is the equilibrium real interest. But Svensson (1997) has shown that the mapping from λ to α and β is by no means straightforward. A higher λ need not even lead to a higher ratio β/α, for example. Nonetheless, Blinder and Reis (2005) estimate that Alan Greenspan had a much higher β/α than either Paul Volcker or the Bundesbank prior to the advent of the euro – a reflection, I believe, of his much higher λ. Furthermore, Rudebusch's

[11] Orphanides (2003) emphasizes this point.

(2001) calculations of optimal α and β for a simple linear model of the U.S. economy under different choices of λ show substantial sensitivity of the ratio β/α to λ, and in the intuitive direction.[12]

Theoretical discussions of the loss function generally end about here. But central bankers should ponder two more issues. The first is the functional form. The quadratic, of course, is motivated solely by mathematical convenience and gives rise, among other things, to certainty equivalence. Never mind the specific quadratic shape; that's a quibble I do not want to raise. The more fundamental question is why low unemployment should be penalized as much as high unemployment – or, indeed, should be penalized *at all* (Cukierman, 2004). The main reason why central bankers worry about low unemployment is that tight markets produce rising inflation. But that should be taken care of by the first term in (1). If, speaking hypothetically, monetary policy could push u down further without pushing π up, why shouldn't it? The late 1990s in the United States is an historical case in point. Did America suffer some loss because the unemployment rate dropped as low at 3.9%?

One obvious answer is the standard micro-inefficiency argument: Deviations from the real competitive equilibrium *in either direction* impose welfare losses. But this argument is not terribly compelling if the real world is not perfectly competitive. For example, monopolistic competition models suggest that output is systematically too low, in which case raising it should yield efficiency *gains,* not losses. Furthermore, some of us believe that low unemployment yields notable social benefits that are at least partially non-economic in nature. Another possible answer, suggested by Cuckierman (2004), is that the inflation bias discussed by Kydland and Prescott (1977) returns if low unemployment is not penalized symmetrically. This may be the best rationale for doing so.

The other oft-forgotten issue in specifying the loss function is that every central bank has either statutory or tacit responsibility for maintaining financial stability. At certain critical times, this objective takes precedence over everything else. So financial stability seems far too important to be left out of the loss function. Researchers commonly model this third objective by adding a term like $\gamma(r_t - r_{t-1})^2$ to (1), on the theory that interest-rate volatility and financial-market instability are highly correlated. Such a crude proxy surely misses many important aspects of financial instability, however, especially during a banking or financial crisis, when financial stability may dominate the central bank's other concerns. So some other approach seems warranted. One posibility is a quasi-lexicographic ordering under wich the central bank minimizes (1) unless serious financial instability arises, in which case it turns its attention to the latter.

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[12] Specifically, when λ=1 (his base case), β/α=.58; if λ=4, β/α rises to .95; and if λ=0.25, β/α falls to .41. See Rudebusch (2001, Table 1, p. 206).

Issue 2: How transparent should the central bank be?

Much has been written on why central banks should be transparent, some of it by me.[13] In fact, there is by now a sizable scholarly literature on this topic, which I will not summarize here.[14] Instead, let me just remind readers that there are *two* main reasons to favor transparency. The one on which economists always focus is that greater openness should make monetary policy more effective by tightening the gears between central bank actions and market expectations. But there is another reason, one which real-world central bankers should never forget: democratic accountability.

One or both of these arguments appear to have persuaded most of the world's central bankers (and/or their governments), because there is an unmistakable trend in the direction of greater openness virtually all over the world. In a quotation from the 1980s of which I have long been fond, Karl Brunner (1981) wrote that:

> Central Banking [has been] traditionally surrounded by a peculiar mystique... The possession of wisdom, perception and relevant knowledge is naturally attributed to the management of Central Banks... The relevant knowledge seems automatically obtained with the appointment and could only be manifested to holders of the appropriate position. The mystique thrives on a pervasive impression that Central Banking is an esoteric art. Access to this art and its proper execution is confined to the initiated elite. The esoteric nature of the art is moreover revealed by an inherent impossibility to articulate its insights in explicit and intelligible words and sentences.

This was a caricature, of course, but it captured the underlying reality of the time. The received wisdom in central banking circles then was: Say as little as possible, and say it cryptically. But attitudes toward transparency have changed dramatically since then, and central banks around the world have opened up.

Although it is still more of a laggard than a leader in terms of transparency, the Federal Reserve is a case in point. Prior to February 1994, the FOMC did not even announce its interest rate decisions as it made them, preferring to let money market professionals figure them out by observing the Fed's open market operations. Highly stylized minutes of FOMC meetings were published at the time, but only after the *following* meeting. Contemporaneous statements after FOMC meetings, however, were rare (and extremely terse) until May 1999.

That is when the Fed made several major changes in its disclosure policies, changes that amounted to a quantum leap in the volume of useful information it

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[13] See, for example, Blinder *et al.* (2001) and Blinder (2004).

[14] For two recent overviews, see Geraats (2002) and Woodford (2005).

provided. First, the FOMC started announcing its "bias" (later changed to "balance of risks") immediately. Second, it began issuing statements after every meeting (whether or not there was a change in interest rates). And third, its statements became longer and more substantive. Here is one simple quantitative measure. In the three years 1996-1998 inclusive, the FOMC issued a total of *five* post-meeting statements, with an average of 58 substantive words per statement – thus *under 100 words per year!*[15] And the Fed said nothing at all after its first two meetings in 1999 (in February and March). But then it issued a statement after each of the remaining six FOMC meetings in 1999, averaging 135 words per statement – thus raising the annual rate to over 1,000 words. This pattern has prevailed (approximately) ever since.

The FOMC took another step toward greater transparency early in 2002, when it began announcing its vote immediately after each meeting, naming names. And finally, starting at the beginning of 2005, the Fed began releasing the minutes of each meeting with approximately a three-week delay – thus *before* the next meeting. None of these changes can be said to constitute a great leap forward. But together they add up to a huge increase in the amount of information released by the formerly-mum Fed – as I once called it, a quiet revolution (Blinder, 2004). And in my view and, much more important, in Chairman Ben Bernanke's view (Bernanke, 2004b), there is more to come.

People often ask if there are limits to (optimal) transparency.[16] My answer is to paraphrase Einstein: Every central bank should be as transparent as possible, but not more so.[17] By this I mean that the default option should be disclosure; a central bank should keep things secrets only when there are good reasons for doing so.[18] And good reasons do exist. For example, the central bank must preserve the confidentiality of proprietary information given to it by private banks – for example, in its role as bank supervisor. (See Issue 5 below.) Similarly, the central bank must maintain the confidentiality of certain information provided to it by governments, both domestic and foreign. I would also not want to open monetary policy meetings to the press, because that would likely destroy the deliberative process. Finally, the central bank cannot disclose information it doesn't have. This last "limit" to transparency may sound silly, but I will offer some concrete examples below. But

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[15] I include in this count only words pertaining either to the economic situation or to the policy decision, excluding standard boilerplate such as the opening sentence, which simply states what the FOMC did ("The Federal Open Market Committee decided today to…"), and the closing paragraphs that announce the vote and the discount rate recommendations of the district banks.

[16] See, for example, Mishkin (2004) and Cukierman (2006).

[17] Einstein said: "Everything should be made as simple as possible, but not simpler."

[18] In contrast, Mishkin (2004, p. 50), suggests that transparency is a good thing only to the extent that it "help(s) the central bank do its job." But, in private conversation, Mishkin has told me that he basically agrees with my position.

apart from such minor exceptions, all of which are non-controversial, I see few effective limits to transparency. More important, I know of no central banks that have bumped up against the constraint of maximal transparency, with the possible exceptions of the Bank of Norway and the Reserve Bank of New Zealand (RBNZ).

If central banks are not yet near their transparency constraints, what remains to be done? The answer, of course, varies by country. For example, the Federal Reserve will, I believe, soon begin announcing its inflation target, π^*, for the first time – something that many central banks have been doing for years. But I think it is a fair generalization to say that, with some notable exceptions, most central banks around the world still reveal rather little about their forecasts. This may be the next transparency frontier.

Of course, nothing in life is simple. Whenever a central bank forecasts more than, say, six months ahead, *future monetary policy* is among the crucial assumptions that must be built into the forecast. So what future monetary policy should be assumed? The debate to date seems to revolve around three main options:

1 unchanged monetary policy throughout the forecast period
2 the monetary policy path expected by the markets (and therefore embedded in, e.g., futures prices)
3 the central bank's (conditional) forecast of its own future behavior.

The current controversy is focused on option 3, which requires the central bank to reveal sensitive information. Until recently, the RBNZ was the only one brave enough to do this, but lately it has been joined by the Bank of Norway. In neither New Zealand nor Norway did revelation of this sensitive information provoke turmoil in the markets.[19] Some would argue that things might be different if the Fed or the ECB were to start projecting their own policy decisions, given the huge volumes of trading in dollar- and euro-denominated securities. But it is by no means obvious how *better* information on the central bank's intentions can do the markets any harm. My guess is that, after a short period of adjustment, releasing conditional forecasts of future monetary policy would reduce, not increase, market volatility. But many central bankers may disagree with my guess, for they are loath to take this step.

There is, however, another intensely practical issue that should not be ignored: Most central banks, certainly including the Fed, do not even *agree* upon long-term (conditional) forecasts of the path of their policy rate. In such cases, the failure to *announce* such a path cannot be viewed as a violation of transparency. Rather, it falls under the seemingly-obvious rubric mentioned earlier: You cannot reveal information you do not have. The broader question, then, is

[19] For the case of New Zealand, see Archer (2005).

whether central banks should (a) *formulate* (conditional) monetary policy plans running one or two years into the future and then (b) *announce* those plans as part of their forecasts. My own answers are yes and yes. But doing so clearly represents a major change in the way most central banks do business. Indeed, *formulating* such plans may be a much bigger change in the current *modus operandi* than *announcing* them once formulated. So option 3 above will probably remain on the "to do" list, and therefore on the list of current issues for central bankers, for quite a while.

What can be done in the interim? Many academics have been intensely critical of option 1 – making forecasts based on constant (policy) interest rates.[20] They point to three main problems: (a) it is logically inconsistent (because, e.g., actual market rates are not based on this assumption); (b) it is non-transparent (because, e.g., the central bank probably does not believe this assumption); and (c) it leads to dynamic instability for the reason first pointed out by Friedman (1968): Holding the nominal rate fixed in the face of changes in inflation moves the real rate in the wrong direction.[21]

I am less critical of the constant interest rate assumption that some of my colleagues – for two main reasons. First, dynamic instability is unlikely to be quantitatively important in forecasts that extend only a year or two into the future. Second, showing that constant interest rates lead to unsatisfactory outcomes serves a useful purpose by providing the predicate for changing monetary policy. Still, the critics' points are valid.

Option 2 above (using market expectations of future central bank policy) eliminates the inconsistency problem and reduces the non-transparency problem. But the instability problem remains because, in dynamic simulations, forecasts taken from *current* market prices will be exogenous rather than endogenous. Using such market-based forecasts also raises the "dog chasing its tail" danger that I mentioned in Blinder (1998) and that Bernanke and Woodford (1997) modeled theoretically.[22]

There is, however, a workable approach that can eliminate all three problems and yet does *not* require that MPC members agree *now* on an entire *path* of future policy decisions. The central bank staff can simply use an empirically-estimated reaction function to project the MPC's future behavior mechanically – *without* attributing those forecasts to the MPC itself. This approach should be roughly consistent with market prices because market participants would probably use something similar to forecast the central bank's behavior. It is also totally transparent, as long

[20] For recent comprehensive treatments, see Svensson (2006) and Woodford (2006).

[21] Purely forward-looking models with rational expectations telescope this dynamic instability back into the present, leading to the failure of such models to converge to *any* equilibrium.

[22] Woodford (1994) was an important precursor.

as the bank reveals the forecasting equation. And finally, it does not lead to dynamic instability as long as the inflation coefficient in the reaction function exceeds one.[23] I would therefore recommend this option to central banks for use right now.

Issue 3: Should a central bank adopt formal inflation targeting?

Recent years have witnessed a notable trend toward a style of monetary policy-making that originated in New Zealand in 1990: inflation targeting. As noted earlier, Berg (2005) counted 20 inflation targeters, and other observers would add a few more central banks to his list. In addition, the ECB can be considered a closet inflation targeter, and both the Fed and the BOJ are actively considering whether to join the ranks.

While much has been written about inflation targeting, I can be brief given what I have already written about transparency (Issue 2) and the central bank's objective function (Issue 1) – because the essence of inflation targeting is announcing a numerical value for π^* and being transparent about it.

Svensson (2005) has argued that transparency should extend to the announcement of the numerical value of λ, the relative weight on the output (or unemployment) gap. But that is another one of those pieces of information that central banks cannot reveal because they do not have it. Most of us, I believe, would have trouble pinning down our own individual λ's.[24] For a monetary policy *committee,* the problem is compounded by having to reach a *group* decision on λ – especially when membership in the committee changes over time.[25]

This discussion does, however, raise an interesting transparency point. All inflation targeting central banks are "flexible" inflation targeters – meaning that they have $\lambda>0$. Why, then, should their policy be called as "inflation targeting" as opposed to, say, "unemployment targeting"? Equation (1) looks pretty symmetric to me. One possible answer is deliberate obfuscation, which Mishkin (2004) argues is quite prevalent. A second possible answer is that π^* is a *choice variable* whereas u^* (or y^*) is a datum that is *given* to the central bank (Svensson (1999), page 626). To me, that answer is unsatisfactory, however, because proper division of labor dictates that the government should select π^* (perhaps in consultation with the bank) and then hand it to the MPC as a datum.[26] The fact that π^* is given by law whereas u^* is given by "nature" should be irrelevant to the central bank, which should simply

[23] For this reason, the Bank of England staff fomerly used a Taylor rule in long-run simulations.

[24] In fairness to Svensson, this would probably be done by examining alternative optimal paths generated by the bank staff for different choices of λ. It is not impossible.

[25] Svensson has suggested voting, with the median voter's preferences prevailing.

[26] One important caveat: π^* should not be chosen so frequently that it becomes a political variable. I like to think of it as being chosen at the "constitutional" stage.

take both targets as given and set about minimizing (1) like a bunch of good Keynesian dentists.

Thus, when we translate equations (which only the experts understand) into words, objective functions like (1) seem more consistent with the Federal Reserve's dual mandate than with, say, the ECB's hierarchical goal or the rhetoric of many inflation targeting banks, as Meyer (2006) points out. Calling the minimization of (1) "inflation targeting" therefore seems to be a step away from transparency.

Transparent or not, central banks (or their governments) still need to decide whether to join the ranks of the inflation targeters.[27] Historically, most (but not all) nations that have adopted inflation targeting did so under duress. Either their monetary policy had failed, leaving inflation too high (e.g., New Zealand), or they were forced to change their monetary policy regime owing to, say, the collapse of a fixed exchange rate (e.g., the UK, Brazil).

But the past need not be prologue. Recent converts to inflation targeting, such as Norway (and, one might say, the United States), have moved in that direction voluntarily – presumably because they were persuaded that the benefits outweigh the costs. What are the benefits? The most obvious answer is lower inflation, though here the reverse causation problem is severe. (Countries that want to reduce inflation are more likely to adopt IT.[28]) Successful inflation targeting should also make inflation less volatile, as Vega and Winkelried (2005) find, and should anchor expectations at or very close to π^*. That nominal anchor, in turn, can give the central bank greater flexibility to respond to short-run exigencies such as high unemployment or oil shocks.

Issue 4: Should monetary policy be made by an individual or a committee?

In yet another "quiet revolution," more and more central banks have begun making monetary policy decisions by committee. Fry *et al.*'s (2000) survey of practices at 88 central banks (about half the total) found that 79 made monetary policy decisions by committee while only nine left those decisions to a single individual. Thus governments around the world have revealed a clear preference for decisionmaking by committee. This phenomenon raises two questions: Why have nations switched from individuals to committees? And is this trend desirable?

The "why" question can be approached in two ways. First, as an *empirical* or *historical* matter, I believe that the main factor underlying the worldwide

[27] As my colleague Lars Svensson likes to point out, no central bank that has made this choice has subsequently abandoned inflation targeting. That is certainly suggestive.

[28] See Ball and Sheridan (2005) and Willard (2006).

trend toward monetary policy committees (MPCs) was the perceived success of the Federal Reserve and the Bundesbank, both of which had long made decisions (at least putatively) by committee. Imitation is, after all, the sincerest form of flattery. In addition, there is no reason to have a monetary policy committee when the central bank is simply taking orders from its government. So the trend toward central bank independence opened the door to committee decisionmaking.

Second, what are some of the *conceptual* or *theoretical* reasons why a central bank might prefer a committee to an individual? Since I have treated this subject at length elsewhere, and because it was recently the topic of an excellent symposium at another European central bank,[29] I can again be brief. In Blinder (2004, Chapter 2), I summarized the main arguments for preferring committee to individual decisionmaking under the following four rubrics:

1 *Pooling:* A committee pools the disparate knowledge of its individual members.
2 *Diversity:* Members of a committee bring different decisionmaking heuristics to a complex problem.
3 *Checks and balances:* Committees are less likely to adopt extreme or idiosyncratic positions.
4 *Reduced volatility:* Owing to "averaging" (which need not be interpreted literally), the decisions of a group are likely to be less volatile.

Perusing these four virtues, only the last might conceivably be turned around and viewed as a vice instead – because one person's low volatility is another's excessive inertia. But Sibert (2005) has pointed to another possible downside of group decisionmaking: that it might devolve into "groupthink," which is really a polite word for not thinking at all, but merely following the crowd.[30]

Empirical evidence – much of it from psychology – points modestly toward the superiority of group over individual decisionmaking, though the evidence is certainly not dispositive and, of course, does not come from studies of monetary policy.[31] This last point is one of the considerations that led John Morgan and me (2005) to design and carry out a laboratory experiment in which students made synthetic monetary policy decisions both as individuals and as

[29] De Nederlandsche Bank held a workshop entitled "Central Banking by Committee" in Amsterdam on November 28, 2005.

[30] Sibert (2005) also devotes a great deal of attention to evidence for free riding and/or social loafing in committees. But I cannot believe this is important on MPCs, where (unlike faculty committees, say) the group decision is the most important task each committee member has.

[31] Kerr *et al.* (1996) is a metastudy of the experimental literature in psychology; they concluded that there is no general answer to the question. See Blinder (2004) for a summary of the economic literature, much of it theoretical. Sibert (2005) offers evidence that questions the superiority of group decisionmaking.

part of five-person groups.[32] It was not surprising, given the literature, that we found that groups outperformed individuals by a modest margin. It was, however, surprising that we found that groups were *not* more inertial – in sharp contrast to 4 above.

Morgan and I are currently working on a sequel to our original experiment, designed to shed light on two further issues. First, do large groups (for us, n=8) outperform small groups (n=4), or vice-versa? This issue is germane to the design of monetary policy committees which, in the real world, range in size from three to 19 members. Second, do groups with designated leaders outperform groups without leaders? This issue is particularly important because all real-world MPCs – indeed, I am tempted to say all real committees – have leaders.

In designing an MPC, size is not the only consideration. Blinder *et al.* (2001) first introduced the following typology, which was further developed in Blinder (2004). Committees can either be *individualistic,* meaning that they make decisions by true majority rule with each member voting for his or her own preferred policy – as at the Bank of England, for example; or they can be collegial, meaning that they agree in advance to submerge individual differences in order to reach a group consensus – as at the Fed or the ECB. Collegial committees can be further divided into those that are *genuinely collegial,* meaning that the chairman seeks the committee's consensus and then persuades recalcitrant members to go along (e.g., the ECB Governing Council), or *autocratically collegial,* meaning that the chairman more or less dictates the "consensus" to the other members (e.g., the FOMC under Alan Greenspan).

I argued in Blinder (2004) that autocratically-collegial committees are liable to behave too much like individual decisionmakers, thereby leaving most of the benefits of group decisionmaking on the table. This logic seems to point toward either genuinely collegial or individualistic monetary policy committees. I argued in Blinder (2005), incidentally, that the most appropriate communication strategy for a central bank hinges sensitively on the type of MPC that it selects, which links Issues 2 and 4. But, I have neither the time nor the space to go into that linkage here.

Issue 5: Should central banks also be bank supervisors?

One noteworthy recent departure from traditional central banking practice is the trend toward taking central banks out of the business of bank supervision and regulation. This new division of labor has occurred in varying degrees (in some places completely) in the UK, Germany, and Japan, to name just a few

[32] This work was subsequently replicated by researchers at the Bank of England. See Lombardelli *et al.* (2005). Our choice of five-person groups was made long before we heard Sibert's (2005) claim that five is the optimal group size!

major countries.[33] And it is highly controversial, with reasonable arguments on both sides.[34] While there are other aspects, the essence of the debate, it seems to me, boils down to whether *economies of scope* or *conflicts of interest* are the dominant effects when monetary policy (sometimes called "macro prudential" policy) and bank supervision ("micro prudential" policy) are consolidated in the same authority.[35]

The (tacit) traditional view emphasizes economies of scope, which imply that the two functions are best performed by the same institution. Why might that be so? Unlike the case with private businesses, the economies-of-scope issue does *not* turn on cost savings; central banks do not save money by using the same staff for bank supervision and monetary policy. Rather, the main issue is whether there are quantitatively meaningful *complementarities* between the central bank's macro-prudential and micro-prudential responsibilities. The Federal Reserve's former Vice Chairman Roger Ferguson (2000, p. 301), believes there are: "I think the Fed's monetary policy is better because of its supervisory responsibilities, and its supervision and regulation are better because of its stabilization responsibilities."

For example, having supervisory authority over commercial banks gives the central bank unique access to timely information on the health and operation of the banking system – information that might be relevant, for example, to making judgments about the credit channel of monetary transmission.[36] Such information becomes obviously important at certain critical junctures; the global financial crisis in the summer and fall of 1998 was one dramatic case in point. More generally, there is at least some evidence that supervisory information enhances the Fed's ability to forecast the economy (Peek *et al.*, 1999).

Looking for complementarities in the other direction, having responsibility for monetary policy might force the bank supervisor to internalize the potential macroeconomic consequences of its actions. To cite a prominent U.S. example, bank supervisors were heavily criticized in the early 1990s for exacerbating the "credit crunch," which in turn hampered recovery from the 1990-1991 recession.[37] More generally, it has been suggested that micro-prudential policies can exacerbate business cycles by, for example, forcing banks to rebuild capital during a cyclical downturn.[38] Recently, bank supervisors have been taking this long-neglected issue seriously (White, 2006).

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[33] See Freytag and Masciandaro (2005, p. 2) for a more complete list.

[34] For a comprehensive look at the arguments *pro* and *con,* see Goodhart (2000).

[35] Among the other aspects is the question of whether assigning supervisory power to the central bank concentrates too much power in one agency.

[36] The Federal Reserve has made this argument many times. See, for example, Meyer (1999) or Ferguson (2000).

[37] Among many sources that could be cited, see Bernanke and Lown (1991).

[38] See Kashyap and Stein (2004) and several of the references cited there.

But there are also arguments on the other side. The very things I just cited as potential economies of scope can be viewed as potential sources of conflict of interest instead. For example, should a supervisor allow sick banks to continue to operate just because macroeconomic conditions are weak? I have just suggested why the answer might be yes. But there is a legitimate worry that a central bank's concern with macroeconomic management might cloud its supervisory judgment, thereby imperiling safety and soundness.

Another set of issues arises from the increasing complexity of financial institutions. A modern universal bank is also an investment bank, a stock brokerage, a funds manager, and an insurance company, to name just a few. The lines that separate one type of financial activity from another are getting blurrier and blurrier all the time, and the activities themselves are growing more complex. For a central bank to monitor all these disparate activities, it needs staff with expertise in securities and insurance (and other things) as well as in banking. It may also find itself bumping heads with the nation's securities and insurance regulators, thereby creating either overlapping jurisdictions or, what is worse, gaps in supervision. Bringing some order to this potential jumble makes it difficult to apply the otherwise-appealing principle of "functional regulation," whereby the banking supervisor watches over banking activities (even if done at Wal-Mart or Merrill Lynch), the securities supervisor polices securities activities (even if done at the Bank of America), and so on. A potentially cleaner approach is to create one financial "super regulator" that can watch over all financial activities at a given institution at once.

Where do I come out on this debate? A bit wishy-washy, I'm afraid, and about where I was when I compiled my 1999 Frankfurt list. There I wrote (Blinder, 2000, p. 69):

> Proprietary information that the central bank receives in bank examinations is of some, limited use in formulating monetary policy – and is on rare occasions very important. So, on balance, it is probably better to have it than not. On the other hand, a bank supervisor may sometimes have to be a protector of banks and sometimes a stern disciplinarian – and either stance may conflict with monetary policy.

I am persuaded that nations should leave at least *some* supervisory responsibility with the central bank. It alone has the broad macroeconomic and even international perspective that is crucial from time to time. It alone has the ultimate responsibility for both macroeconomic and financial stability. And it alone has the resources to serve as lender of last resort should the need arise. Given all that, it seems unwise to deprive the central bank of supervisory information that might be relevant to performing its job. And I do not believe that getting that information secondhand is quite as good as getting it firsthand.

But that does not imply that the central bank must be the sole or even the dominant bank supervisor, especially in countries with hundreds or thousands of non-universal banks. Central bank involvement in bank supervision needs to be thought of as lying along a continuum, not as a "zero-one" variable. The U.S., with four different federal bank regulatory agencies (and 50 more in the states), is a clear example.[39] The Fed should be able to access all the information it needs for monetary policy purposes by serving as the "umbrella supervisor" of all large bank holding companies. And it should be in a good position to monitor systemic risk as long as it has a window into every large financial institution. Neither role requires the Fed to be the primary supervisor of hundreds of small banks – as it is today. In this regard, it is striking that, for example, the Bank of England, which has been entirely excluded from the supervisory arena, has not protested that this exclusion has damaged its ability to conduct monetary policy.

In any case, regardless of my own views, this is surely a live issue that must be addressed by central banks and governments all over the world.

II Operating principles for monetary policy

I turn next to a set of six questions related to how central banks should conduct monetary policy

Issue 6: Should central banks be so averse to policy reversals?

As a broad generalization, the practice of monetary policy seems to be growing closer and closer to the way macroeconomists conceptualize it. Increasingly, central bankers utilize staff analyses, even quite complicated analyses, and think about policy options in the way that technical economists do (e.g., via expectational effects, output gaps, Phillips curves, and the like). In fact, and in contrast to past practice, many central bankers these days even are economists. The current heads of the Federal Reserve System, the Bank of England, and the Bank of Israel, for example, are all former academic stars. Yet economic analysis and central banking practice appear to diverge sharply in at least one prominent respect. The matter is what I call *reversal aversion* – the unwillingness of central bankers to reverse direction.

Consider the problem of minimizing the expected discounted present value of a loss function like (1) subject to a dynamic, stochastic model of the economy. Various aspects of the model, including both the shocks and the coefficients, are liable to be changing all the time, which means that the optimal path of the policy

[39] Not that I would recommend this crazy-quilt structure to any other country!

instrument is also changing all the time. Suppose the central bank's policy rate has been rising for several meetings, in an attempt to restrain aggregate demand. Now suppose an external shock *reduces* aggregate demand sharply. There is then a reasonable chance that the central bank's *optimal* policy rate would decline even though it has recently been rising.

Although the basic logic of optimization suggests that such *policy reversals* should not be uncommon, central bankers seem to avoid them like the plague. For example, suppose we use the arbitrary but reasonable definition that a policy reversal is a change in direction within three months. Then the allegedly activist British MPC has had only one policy reversal out of 32 interest rate changes in its brief history (which began only in mid 1997).[40] The Swedish Riskbank began using the repo rate as its central policy tool in mid 1994, and since then it has changed the rate 66 times.[41] Only two of these were policy reversals, one coming just after the September 2001 terrorist attacks in the United States. The history of the Greenspan Fed was longer (18½ years) but similar: It shows just three reversals out of 98 policy moves, two of which were associated with the 1987 stock market crash. So reversals are rare. The question is why. And the further question is: Are central banks right to avoid them so assiduously?

As just noted, simple versions of optimization theory say no. There is nothing particularly strange about a sequence of optimal choices that, say, first rises and then falls. Remember Keynes's classic retort to being chided for changing his mind: "When I learn new facts, sir, I change my opinion. What do you do?" So, if it is rational to avoid reversals, what factors might standard optimization theory be missing?

One is the dual problem of simultaneous optimization and (re)estimation in a world of pervasive uncertainty. Statistical devices such as Kalman filters (which are just an example) will give rise, e.g., to forecasts and parameter estimates that evolve slowly as new information is received. Policy based on such forecasts and estimates would also evolve slowly.

Another factor is surely central bankers' concern with their *credibility.* If citizens, and perhaps even markets, do not understand the underlying model, do not observe the shocks very well, or do not understand the logic of optimization in the face of "news," they might misinterpret a sequence in which interest rates first rise and then fall as *prima facie* evidence that the bank had erred.[42] That belief, in turn, might undermine the bank's credibility or, in an extreme case, even threaten its independence. At minimum, a quick policy reversal poses a major communication problem. Central banks worry about the loss of credibility a great deal. To cite just

[40] Widening the window to four months would add two more reversals. The count in this paragraph were all current through the end of March 2006.

[41] This count is a bit skewed by 25 changes in 1996, mostly of them small.

[42] This point is emphasized by Goodhart (2004).

one example, Alan Greenspan told the FOMC in July 1996 that, "If we are perceived to have tightened and then have been compelled by market forces to quickly reverse, our reputation for professionalism will suffer a severe blow."[43] Hundreds of similar statements must have been made by central bankers all over the world.

A second factor leading to reversal aversion may be concern with *financial market stability.* Frequent policy reversals by the central bank might induce unwanted volatility in financial markets as traders felt they were being whipsawed. And a third factor, of course, is the natural unwillingness to be seen as admitting error. So, on balance, the observed aversion to policy reversals is understandable – whether or not it is optimal.

There is, however, a downside to refusing to reverse course. Remember that a central bank that will not change its policy stance even though it is optimal to do so will from time to time find itself falling "behind the curve" – and will subsequently have to play catch-up. That in itself can cause turbulence in financial markets. More important, falling "behind the curve" presumably means either that the inflationary cat gets out of the bag or that the economy suffers a longer slump than is necessary.

Thus reversal aversion is of a different character from the other issues on my list. In the main, I have chosen matters that are currently controversial. This one apparently is not; virtually all central banks seem to exhibit strong aversion to policy reversals. The operational question here is: *Should* the advisability of reversal aversion be a subject of active debate? And my answer is yes.

Issue 7: Is the preference for gradualism rational?

To a greater or lesser degree, central banks around the world also seem to exhibit a strong revealed preference for *gradualism,* that is, for tightening or easing in a series of small steps rather than making fewer, larger rate changes. Econometrically, this means, for example, that when Taylor rules like (3) are estimated on real data they always need to include the lagged dependent variable, viz:

$$i = r^* + \pi + a(\pi - \pi^*) + b(u^* - u) + \theta i_{-1} + \varepsilon. \qquad (4)$$

This equation is typically derived by appending a partial adjustment mechanism,

$$i = \theta i_{-1} + (1-\theta) i^* , \qquad (5)$$

to the specification of the *desired* funds rate, i*, given by (3). Since a typical estimate of θ is 0.8 or more in quarterly data (Rudebusch, 2005), the implied adjustment is very slow.

[43] Quoted by Meyer (2004), p. 56.

TABLE 1 **FREQUENCY DISTRIBUTIONS OF POLICY RATE CHANGES**

Rate change	Federal Reserve (a)	Bank of England (b)	Sveriges Riskbank (c)
Below 25 bps	17	0	32
Exactly 25 bps	61	28	27
26-49 bps	3	0	2
Exactly 50 bps	17	4	5
Above 50 bps	1	0	0
TOTAL	**99**	**32**	**66**

a. August 1987 through March 2006.
b. May 1997 through March 2006.
c. June 1994 through March 2006.

Table 1 displays the observed distributions of the interest rate changes actually promulgated by the three central banks mentioned in the previous section: the Federal Reserve, the Bank of England, and the Swedish Riksbank. The strong preference for small changes is evident at all three banks: The fraction of all rates changes that is 25 basis points or less is 79% for the Fed, 88% for the BoE, and 89% for the Riksbank. To put some perspective on this, remember that Willem Buiter, a member of the Bank of England's original MPC, once famously derided a 25 basis point rate change as "chicken feed," presumably because it is unlikely that 25 basis points would ever be enough to push "actual" to "desired" anything.

What the table does *not* show is the huge amount of serial correlation in the data. The Fed is a nice example. It cut rates 24 times between June 1989 and September 1992, and then raised rates seven times between February 1994 and February 1995. Later, it raised rates six times between June 1999 and May 2000, and subsequently cut rates 13 times between January 2001 and June 2003. From June 2004 through June 2006, it raised rates by 25 basis points at 17 consecutive FOMC meetings. None of these episodes was interrupted by even a single move in the opposite direction. If Newton had observed such data, he might have concluded that a central bank in motion tends to stay in motion in the same direction. Why is that?

One reason is *option value.* In a world of constant change, pervasive uncertainty, *and* a strong aversion to policy reversals, a central bank may assign a high value to "keeping its options open" – literally. One way to accomplish that is to move interest rates more gradually than suggested by simple optimization theory (without learning or adjustment costs) – so that you can always stop without having to reverse direction. Notice the crucial role of reversal aversion in this argument. Changing policy *now,* rather than waiting for later, forecloses options *only* if you have reversal aversion – for otherwise, you can quickly undo whatever you have just done. (Analogously, a stock option, once exercised, is gone.) So central

bankers' intense aversion to policy reversals is probably one significant factor contributing to monetary policy gradualism.

Whether the gradualism induced by reversal aversion should be decried or applauded is, of course, a matter of debate. Standard optimization theory is often interpreted as saying that the policy instrument should follow something close to a random walk because the central bank should move its policy rate only in response to new information. For example, William Poole (2003, pp. 5-6), a current member of the FOMC who was formerly an academic economist, wrote:[44]

> In my view of the world, future policy actions are almost entirely contingent on the arrival of new information… Given information available at the time of a meeting, I believe that the standing assumption should be that the policy action at the meeting is expected to position the stance of policy appropriately.

But the Greenspan Fed often did not behave this way, and one major reason, I believe, was Greenspan's devotion to keeping his options open. He always wanted to maintain the flexibility to stop at any moment without having to reverse course (Blinder and Reis, 2005). One way to accomplish that is to move cautiously when you move.

A second plausible reason for gradualism is serially-correlated shocks and/or gradual updating of forecasts and parameter estimates, which would keep the central bank moving in the same direction over a series of meetings. Rudebusch (2005) points out that econometricians cannot readily distinguish between partial adjustment and serially-correlated errors. So, rather than observing what appears to be central bank inertia, we might just be observing non-inertial responses to serially-correlated shocks and changing information. Indeed, Goodhart (2004) suggests that serially-correlated forecast errors explain what appears to be gradualism at the British MPC, and Sack (2000) found that serially-correlated shocks help explain the FOMC's observed (and seemingly inertial) reaction function.

A third possible explanation of gradualism derives from what I have labeled "Brainard conservatism" (Blinder, 1998). In a seminal paper, William Brainard (1967) suggested that, unlike additive uncertainty, multiplicative uncertainty should induce a policymaker to move his instrument less than he would under certainty equivalence. Even in Brainard's original paper, this was not a tight deduction, but rather a result that held for certain (plausible?) parameter values – basically that covariances were not too large. Subsequent research has verified the fragility of Brainard's result in a variety of more complex settings. There is no Brainard conservatism *theorem*.[45] Yet I still believe what I wrote in Blinder

[44] I have a hard time squaring this quotation with moving the Federal funds rate by 25 basis points at 16 consecutive meetings. I suspect Poole does, too.

[45] This was clear already in Chow (1975), Chapter 10. See also Rudebusch (2001) and many other sources.

(1998, p.12): "My intuition tells me that this finding is more general – or at least more wise – in the real world than the mathematics will support."[46] Notice that if a wise central banker is conservative in the Brainard sense, he will normally move the policy rate too *little* to put it where he thinks it should be. He will therefore have to move rates again and again – presumably in the same direction.

A fourth motive for gradualism is the desire to smooth interest rates. As I noted earlier, central bankers often associate interest-rate volatility with financial-market instability, perhaps because rate changes lead to asset revaluations. Hence a concern with financial stability can rationalize adding a term like $\gamma(i_t - i_{t-1})^2$ to the central bank's loss function. If that is done, the lagged interest rate is carried naturally into the monetary policy reaction function, without any need to posit the existence of adjustment costs. In fact, Rudebusch (2001) finds that positing a substantial value of γ helps explain the Fed's observed – and quite inertial – reaction function.

Woodford (2003) has constructed a rather different explanation for gradualism based on the importance of pre-commitment. He uses a specific forward-looking model based on Calvo (1983) pricing, in which only some prices are free to adjust each period. In that setting, he argues that, *if* the central bank can *precommit* to a future path of interest rates, then firms that are free to set prices now will expect rates to keep moving in the same direction. They will therefore adjust their prices by more, thereby compensating for those who cannot adjust their prices at all. This is beneficial in Woodford's model because faster price adjustment keeps the economy closer to its full-information equilibrium. While Woodford's paper is frequently cited by academics, I am skeptical that this specific mechanism influences real-world central bank thinking very much. Nonetheless, the basic idea that expected gradual adjustment of *short* rates can lead to strong reactions of *long* rates is probably quite general (Bernanke, 2004a).

In short, we have a plethora of explanations for why gradualism might be rational. I have mentioned five: option value, serially-correlated shocks, Brainard conservatism, the desire to smooth (market) interest rates, and expectational effects on long-term rates. Any one of them will do. The question is: Which are the operative reasons?

Issue 8: Is monetary fine tuning possible? Desirable?

Were it not for the success of Alan Greenspan as Chairman of the Federal Reserve, the next issue would not be on my list at all. "Fine tuning" sounds like an archaic phrase left over from the 1960s. Ever since the 1970s, it has been

[46] Simulations by Onatski and Williams (2003) suggest this as well.

used more often in a pejorative sense than in a prescriptive one, as when my colleague Lars Svensson (2001, p.1) warned that "the complex transmission mechanism of monetary policy, the varying lags and strength of the effects through different channels, unpredictable shocks and inherent uncertainty combine to prevent the use of monetary policy for fine-tuning." In other words: *Do not attempt this at home.*

But Alan Greenspan did, and he succeeded. It is worth asking how. More germane to this paper, it is worth asking whether other central bankers should try to fine tune their own economies. But what, precisely, does that mean? Blinder and Reis (2005), who focus on this question, suggest two aspects:

(a) pursuing an activist stabilization policy that strives to keep inflation and unemployment close to their targets. With a reaction function like a Taylor rule, that would mean utilizing relatively high values of α and β.
(b) adjusting the central bank's policy instrument(s) frequently in pursuit of that goal. Note that, as just argued, frequent adjustment presumably means that the typical interest rate change will be small.

But fine tuning certainly does *not* mean:

(c) achieving or expecting to achieve perfection.

We have already noted that most central banks practice (b). What about (a)? I am tempted to answer with Bobby Kennedy's famous rhetorical question: *Why not?* Consistent with (c), no basketball player expects to hit 100% of his shots – and none does. Nonetheless, the objective is always the same: to toss the ball in the center of the basket, in line with (a). Archers behave similarly when they aim their arrows. Indeed, what else should they do? The real fine-tuning issue, it seems to me, is how hard to try.

If there is an argument against trying too hard, that is, against reacting strongly to output and inflation gaps, it must revolve around the dangers of oversteering and, therefore, of accidentally *destabilizing* the economy. How realistic is that danger? Rudebusch's (2001) analysis of optimal versus actual policy in a simple linear model of the U.S. economy points strongly toward the opposite conclusion: that the Fed's α and β are too *small.* On the other hand, some of the simulation findings in Rotemberg and Woodford (1997), Levin, Wieland, and Williams (1999), and Orphanides and Williams (2005) suggest that the Greenspan Fed reacted too strongly to unemployment or output gaps (but not to inflation gaps). The issue seems open. It also strikes me as an important practical issue for central bankers to resolve.

Issue 9: Central banks and financial markets: Who leads and who follows?

In Blinder (1998, pp. 59-62), I argued that central banks should guard their independence from financial markets as zealously as they guard their independence from politics,[47] an argument I picked up in much greater detail in Blinder (2004, Chapter 3). But other than the theoretical paper by Bernanke and Woodford (1997), I have seen almost no scholarly attention to this matter. To frame the issue, consider two stereotypes:

- *Old-Fashioned Central Bank* sees itself as a sometimes-stern disciplinarian that lords it over the unruly, and sometimes downright foolish, financial markets. It sees itself both as the adult at the party and as the boss. It therefore expects the markets to follow its lead, even though it knows they will not always oblige.
- *New-Fangled Central Bank,* by contrast, is deeply respectful of markets. It sees itself as more of a student of the financial markets than as a teacher, and it respects the markets for their power and wisdom. It routinely uses asset prices to "read" what the markets expect it to do, and it is loath to deviate much from that expectation.

As a broad generalization, my claim is that Old-Fashioned Central Bank is giving way to New-Fangled Central Bank in the real world. In part, such a movement is inevitable and appropriate – after all, Old-Fashioned Central Bank is a bit of a throwback. But I worry a bit that the shift may be going too far.

Why might this be of concern? One reason is the dog-chasing-its-tail problem mentioned by Blinder (1998) and modeled formally by Bernanke and Woodford (1997). When central banks follow market forecasts, which are in turn based on forecasts of the central bank's own behavior, the result can be either dynamic instability or a failure of equilibrium to exist, depending on whether the model is backward or forward looking. In the real world, this problem would likely manifest itself in a monetary policy that tends to overshoot in both directions, just as speculative markets do.

Finally, there is the related matter of time horizons. Economic models normally pretend that financial markets are populated by coolly-rational, farsighted investors with long (if not infinite) time horizons. But this benign view of markets contrasts sharply with what people in the trenches see every day on trading floors. As Fischer Black slyly put it, financial markets look much more efficient from the banks of the Charles than from the banks of the Hudson. On

[47] A version of these lectures was first given in 1995, while I was Vice Chairman of the Federal Reserve Board.

the banks of the Hudson and in other financial centers where prices are actually made, you find hordes of young traders who are susceptible to fads, herding, and occasional hysteria. These people tend to have incredibly short time horizons, extending at most to the end of the current pay period and maybe only to the end of the trading day.

Notice the great irony here. One of the main reasons why central banks should be independent of politics is that politicians have notoriously short time horizons, extending at most to the next election. Well, the next election is usually much further away than the close of the trading day. Wouldn't it be a shame if central bankers, in an effort to be "modern", escaped from the control of shortsighted politicians only to put themselves under the thumb of even more shortsighted traders?

To be sure, central banks cannot cut themselves off from the markets – and should not try. Markets are not only the main transmission mechanism for monetary policy but also invaluable sources of information. They need to be respected, though perhaps more for their power than for their wisdom.[48] One way to conceptualize my basic point is to contrast the two different meanings of the English verb *to listen.* Should central bankers listen to the markets? Yes, in the sense that we should all listen to news broadcasts; but *not* in the sense that children should listen to their mothers.

Issue 10: Should central banks intervene in foreign exchange markets?

One arena in which the preeminence of market judgments over central bank judgments clearly holds sway is the prevailing attitude toward foreign exchange intervention. Let me break this issue into two closely-linked questions:

1 Do central banks have the power to move exchange rates with *sterilized* intervention?[49]
2 If so, should they use that power?

Question 2, of course, comes straight from the previous issue. If markets always get the exchange rate right, there is certainly no reason for central banks to intervene. So let's at least entertain the possibility that markets sometimes get exchange rates badly wrong. If you reject this possibility, you can skip straight to the next section. But you must also explain the value of the dollar in early 1985 – and perhaps today as well.

Current thinking in academic and, even more so, in central banking circles runs strongly against foreign exchange intervention – mostly answering "no" to both ques-

[48] On this, see Issues 12 and 13 below.

[49] The power of unsterilized intervention is not at issue. This section pertains only to sterilized intervention.

tions. Regarding Question 1, the empirical evidence has long been read to say that central banks have little ability to move exchange rates, except perhaps fleetingly, without changing their monetary policies. But more recent academic studies, using better data, suggest a bit more scope for unsterilized intervention (Sarno and Taylor, 2001).

The negative consensus always struck me as a bit peculiar, anyway. Why are central banks unable to move currency rates when shifts in private-sector supply and demand move them all the time, and by large amounts? No one thinks that private currency traders are powerless to move exchange rates. Why do they lose this power if they go to work for the public sector? I believe the answer must be quantitative rather than qualitative: Private sector traders regularly buy and sell currencies in far greater volume than central banks do. So, to me, the real question is more normative than positive: *Should* a central bank buy or sell the (possibly large) amount of foreign currency required to move its exchange rate?

A negative answer is certainly tenable. Especially in the case of a major, actively-traded currency like the dollar, euro, or yen, the requisite volume of transactions might be gigantic – which would put the central bank at risk of large capital losses if it is wrong. In such cases, the central bank had better be very sure (a) that it is right and (b) that the exchange rate goal is important enough to justify taking the risk. (And if the exchange rate goal is that important, maybe it should use unsterilized intervention anyway.) Such massive foreign exchange interventions may also have to be asymmetric. While a central bank can always supply as much domestic currency as needed to hold its exchange rate down,[50] it may not have enough foreign exchange reserves to prop its exchange rate up.

For the most part, I accept this consensus: Outguessing markets is a hazardous business. But, in my view, we must allow for some exceptions.[51] For example, there are times when currency misalignments are glaringly obvious, even if the "right" exchange rate is not. The dollar in early 1985 (far too high), the dollar again in the spring of 1995 (too low), and the euro in the spring of 2001 (too low) are cases that quickly spring to mind. While neither the timing nor the amount of the market's eventual correction could have been known in advance, it was not hard to recognize that exchange rates were misaligned; and the eventual direction of change was obvious. In cases like that, chances are good that many market participants are aware of the same facts as the central banks, and so are holding their positions nervously. That should make it possible for a large (and hopefully concerted) intervention by central banks to push the forex market in the direction in which it was destined to go anyway.

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[50] Assuming it can sterilize the foreign currency inflows.

[51] Below, under Issue 14, I outline the conditions necessary to make it sensible for a central bank to try to "burst" an asset-market bubble. Here I am, in essence, claiming that these conditions are occasionally met in the case of exchange rates.

But Question 2 remains. Is the exchange rate a sufficiently important relative price that the central bank should (a) temporarily take its eye off its true targets (inflation and unemployment) and (b) accept the risk inherent in large-scale currency speculation? My own answer is: normally no, but sometimes yes. For example, there are rare times when exchange rates are so misaligned that they distort trade patterns so much, or interfere so much with demand management, that it becomes rational for the central bank to intervene in large volume. Another possibility, which is exemplified by China today and perhaps by Japan in 2003-2004, is that a nation might believe that its vital interests are best served by a lower exchange rate than the free market would deliver – and be willing to pay the price to achieve it.

I realize that I am delivering this paper in a euro-zone country with no exchange rate to worry about. But the ECB may have to deal with the exchange rate issue once again when the markets not only correct the current overvaluation of the dollar but probably overshoot. And, of course, the belief that recent months have constituted one of those rare moments when concerted intervention makes sense is what underlies recent suggestions for a "new Plaza accord" (Cline, 2005). So I would like to resurrect the intervention issue, which has been dead and buried for too long, and commend it to the attention of central bankers.

Issue 11: Should monetary policy use the derivatives markets?

I noted earlier that financial markets are big, powerful, and innovative. Nothing illustrates these traits more dramatically than the explosive growth of the markets for derivatives. Derivatives pose many interesting and difficult issues for supervisors and regulators but, in keeping with my assignment, I confine myself to their potential role in monetary policymaking,[52] which comes in three parts:

1 as a source of market information
2 as part of the monetary transmission mechanism
3 as possible assets for open-market operation.

The first two are uncontroversial. Given the liquidity and volume of trading in, say, interest rate swaps, central banks would be foolish to ignore the signals emanating from those markets – and they don't. Similarly, the most dramatic early influences of a central bank's policy moves, or even of expectations of policy moves, may well be registered in the markets for derivatives such as interest rate futures.

[52] For this reason, I restrict myself to fixed-income derivatives, such as swaps.

Since these markets, in turn, are linked to the interest rates that matter for real economic decisions, such as those on home mortgages and business loans, they are a key component of the monetary transmission mechanism. I don't think anyone doubts either of these propositions.

But the third potential role for derivatives is highly speculative at this point; I do not know of a single central bank that conducts open-market operations in derivatives.[53] I raise the possibility as an issue for the future. Why?

One reason is the sheer size and growing importance of some of these markets, which means they are terrifically deep and liquid. It has often been said that the Federal Reserve conducts open market operations in the U.S. Treasury bill market because that is the deepest, most liquid market in the world; and similar statements are made about other central banks. Well, that may no longer be true. And even if it is true today, it may not be true tomorrow, given the rapid expansion of the derivatives markets. Central banks of the future may discover that they can get faster, more reliable execution in the swaps market, for example.

Another reason stems from the juxtaposition of rapid growth of the derivatives markets against slow growth of central bank balance sheets. Some observers feel that the markets are already so large and innovative that central banks have a hard time moving even short-term interest rates via conventional open-market operations.[54] One obvious answer, of course, is to conduct ever-larger openmarket operations – which is where the size of central bank balance sheets comes in. If, for example, currency shrinks relative to GDP while fixed-income markets grow, central banks may find their portfolios of T-bills shrinking relative to the size of the open-market operations needed to move markets.[55] If and when this happens, *leverage* may be the answer; and that, of course, is where derivatives come in. Market participants routinely use derivatives to create huge amounts of leverage, and thus effectively to control large volumes of securities with relatively little capital. Why can't central banks, who are certainly higher-rated counterparties, do the same? It's something to think about.

Of course, central banks will want to move into this domain cautiously, if at all. They are stodgy to begin with, appropriately so in my view; and derivatives have a vaguely disreputable public image. But most of the "accidents" in the de-

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[53] I ignore the Bank of Thailand's use of foreign exchange derivatives in 1997 because that seems to have been motivated by a desire to conceal its true reserve position, not as a way to conduct monetary policy. The Bank of Mexico deals in options on the peso to influence (not peg) its exchange rate – though transparently. Finally, as part of its efforts to guard against financial disruption at the end of the millennium, the Federal Reserve sold call options on repos in October-December 1999. (See Drossos and Hilton (2000).) I am grateful to Steve Cecchetti for calling these last two cases to my attention.

[54] I am, personally, rather skeptical of this argument. But one hears it all the time.

[55] Note the parallelism to the previous issue about exchange rate intervention.

rivatives markets, not to mention the frauds, have taken place in "exotics," not in plain-vanilla interest rate swaps, which are simple, transparent, and either are or can be traded on organized exchanges. And it is, of course, in plain vanillas that any sensible central bank would operate. For this reason, I believe that conducting open-market operations in swaps would confer a side benefit by steering markets away from exotics toward more plain vanilla swaps. Indeed, were I of a mind to predict the *future* of central banking, as opposed to just analyzing the *present,* I'd be tempted to forecast appearances by central banks in the swaps markets. But for now, it is just something to think about.

III The transmission mechanism for monetary policy

I turn, finally and more briefly, to five controversial and/or poorly understood aspects of the transmission mechanism for monetary policy.

Issue 12: Transmission via the term structure of interest rates

The simplest version of the monetary transmission mechanism traces the central bank's influence from overnight rates (which it controls) to longer-term interest rates and thereby on to aggregate demand. The link from short rates to long rates is normally based on the *expectations theory of the term structure* of interest rates, which states that intermediate- and long-term rates are the appropriate weighted averages of expected future short rates.

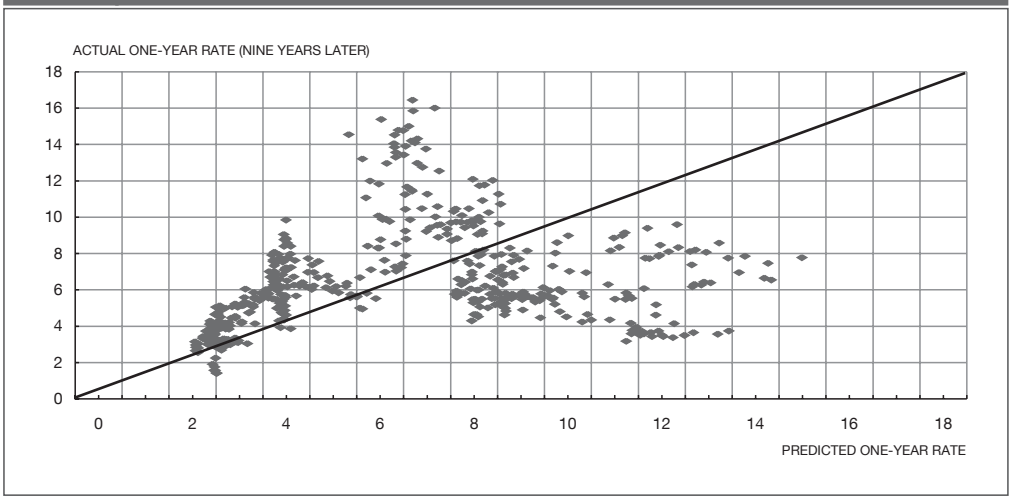
There is a catch, however. It has been known for years that the expectations theory fails virtually every empirical test miserably, at least when expectations are rational.[56] A one-sentence synopsis of this literature is that long rates are terrible (and biased) predictors of future short rates. To show just one example, I reproduce below a graph from Blinder (2004, p. 78). It shows, on the horizontal axis, the one-year U.S. Treasury bond rate expected to hold nine years ahead *according to the yield curve* and, on the vertical axis, the *actual* one-year rate nine years later. There is hardly any correlation between the two.[57]

Just why this is so remains a major intellectual puzzle. To blame the puzzle on time-varying term premia is just to give it a name – like blaming ma-

[56] Among the many references that could be cited, see Campbell (1995). Chow (1989) suggests that the theory fares better under the assumption of adaptive expectations.

[57] The straight line drawn in the graph is *not* the best-fitting regression line. It is a line with a freely-estimated intercept (to allow for a constant risk premium) and a slope of 1.0, which is the slope implied by theory. The slope of the actual regression line (not shown) is only 0.27. The underlying data are for U.S. zero-coupon bonds, monthly from December 1949 through February 1991.

FIGURE 1 **ACTUAL INTEREST RATES AND PREDICTIONS FROM THE TERM STRUCTURE**



chine malfunctions on "gremlins." In Blinder (2004, Chapter 3), I suggested (but certainly did not prove) that the expectations theory fails because long rates are far more sensitive to short rates than "rational" pricing models predict. This hypothesis may or may not be correct. My main purpose in calling attention to the term structure puzzle here is not to resolve it, but rather to urge central bank research departments to give it high priority. It may be the piece of the monetary transmission mechanism about which we are most in the dark.

This issue relates, by the way, to Issue 9. If markets are so bad at forecasting future short-term interest rates, why should we give so much deference to their forecasts of anything else – including future central bank policy?

Issue 13: Transmission via exchange rates: uncovered interest-rate parity

The mention of unresolved puzzles and terrible forecasts leads naturally to the next issue: the equally-embarrassing failure of *uncovered interest-rate parity.* If one-year interest rates are 5% in the United States and 3% in Germany, the market is implicitly forecasting a 2% depreciation of the dollar against the euro over the coming year. And a similar forecast is implied by every other pair of international interest rates over any horizon. Thought of in terms of monetary policy, when divergent central bank policies engineer international interest rate differentials, those differentials are supposed to first *forecast* and then *become* exchange rate movements. Unfortunately, on average they do not. Not only are

uncovered interest-rate parity relationships *terrible* forecasters of future exchange rate movements, they often get the sign wrong.[58]

This is a serious matter. In the usual story of the role of exchange rates in monetary transmission, a country that *raises* its interest rates experiences a currency *appreciation.* The theory of uncovered interest parity explains that this happens in order to induce (rational) expectations that the currency will subsequently *depreciate* back to its original (real) exchange rate. Thus a tightening of monetary policy is supposed to lead to a quick appreciation followed by a depreciation. Nice and logical. But, empirically, it does not happen. How, then, does monetary policy influence exchange rates? A good question. And until it gets a good answer, central bankers are operating in a dense fog. So this issue also ranks high on the research agenda – and high on the list of reasons not to place excessive trust in market forecasts.

Issue 14: How should central banks react to asset-price bubbles?

Asset prices are an important part of the monetary policy transmission mechanism. Other things equal, when stock or home prices rise, a central bank that is targeting, say, a weighted average of the inflation and output gaps will raise interest rates because wealth effects might otherwise drive aggregate demand up too fast. This is old hat, uncontroversial, and a standard part of monetary policy practice.

But should central banks react to asset-market bubbles *per se,* meaning *over and above* the amount implied by the link from asset prices to wealth to aggregate demand? In the loss function context, that would mean adding some asset prices (e.g., stock prices) as a third argument of the loss function. In the Taylor rule context, it would mean adding those prices as another term in the equation, as Cecchetti *et al.* (2000) explicitly recommend, so that the central bank would then raise interest rates as stock prices go up even *if y and π were both on target.*[59] Both the current and previous chairmen of the Federal Reserve are on record as opposing this idea (Bernanke and Gertler (1999), Greenspan (2002)), as am I (Blinder and Reis, 2005, pages 64-70). Since so much ink has been spilled on this issue, I can be very terse in outlining the *pros* and *cons.*

Proponents of bubble bursting argue that:

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[58] Among the many sources that could be cited, see Wadhwani (1999) and Meredith and Chinn (2004).

[59] Cecchetti *et al.* (2000) explicitly state that the central bank should *not* have a target price for the stock market, but should just "lean against the wind." Thus stock prices enter the Taylor rule with a positive coefficient, but there is no target level for stock prices.

- the central bank has a clear responsibility to preserve financial stability, which is threatened by asset bubbles.
- *sizable* bubbles can, in fact, be detected by applying U.S. Supreme Court Justice Potter Stewart's famous test for pornography: "You know it when you see it." Furthermore, they can be recognized *early enough* to do something about them.
- bubbles lead to misallocations of resources (e.g., the Internet craze) and also damage conventional macroeconomic stability (e.g., when a slump follows a stock market crash).
- the central bank has instruments at its disposal that can deflate bubbles without doing undue harm to its primary goals, inflation and unemployment.

This last argument is usually tacit, not explicit, but it is essential. Without it, bubble-bursting may do more harm than good, even if all the rest is right.

Opponents of bubble-bursting concede that bubbles do happen, do cause resource misallocations, and are sometimes recognizable. But they argue that:

- financial stability can be maintained by what Reis and I (2005) called the "mop up after" strategy.
- bubbles generally become "obvious" only after they have inflated quite far, and attempts to identify them earlier would likely produce many false positives.
- the central bank is not responsible bad private investment decisions, and the macroeconomy is best managed by focusing monetary policy on inflation and unemployment.
- the central bank has no instruments suitable for targeting specifically at bubbles. Raising interest rates enough to burst a bubble would likely burst the economy as well.

I find the second set of arguments far more compelling and, in support, I offer the following quick reflections on the greatest bubble in history: the U.S. stock market bubble of 1998-2000.[60] The idea is that, if the case for bursting bubbles didn't apply then, it may never apply.

First, the stock market bubble was recognizable, but only rather late in the game; and acting too early could have been disastrous. For example, even during its worst months after the crash, the market never returned to where it was on the day in December 1996 that Alan Greenspan declared it to be "irrationally exuberant." Should the Fed have tightened in 1996 and squelched the ensuing

[60] Similar facts apply to Europe and Japan. The tech-stock bubble was a worldwide phenomenon.

boom? My answer is no. Second, the "mop up after" strategy worked extraordinarily well even in this extreme stress test; not a single sizable bank or brokerage firm went bankrupt. Third, despite the fact that a staggering $8 trillion in wealth was vaporized, the post-bubble recession was so small that it disappears in annual data. Finally, if the specific concern was tech stocks, what instrument could (or should) the Fed have used to target this idiosyncratic sector?

While my personal opinion is clear, the main point is that real-world central bankers need to make a decision on this issue.

Issue 15: Dealing with the zero lower bound on nominal interest rates

While central banks control the (very) short-term *nominal* interest rate, most economists believe that it is *real* interest rates that influence economic activity.[61] In a deep slump, the central bank would like to make real short rates negative. But this is impossible if the inflation rate is zero or negative, because nominal interest rates cannot fall below zero. For decades, most economists viewed this issue as a theoretical curiosum of no practical importance. But Japan has taught us otherwise.[62]

What to do? First, prevention is clearly better than cure. Bernanke, Reinhart and Sack (2004) creatively examined various unconventional monetary policies – things that a central bank confronted by the zero lower bound might try – and I would add exchange-rate intervention to their list. I think it is fair to say that such a central bank would not be powerless. That's the good news. However, the unconventional policies are likely to be far weaker than conventional interest-rate policy. That's the bad news. So it is certainly better not to flirt with zero.

Inflation targeting, or rather *successful* inflation targeting, should help. By posting a target, π^*, that is safely above zero, and then achieving it, a central bank can avoid confronting the zero lower bound. At worst, it can always push the short-term real interest rate down to $-\pi^*$, which is why π^* should be bounded away from zero. Of course, with shocks and control errors, even an inflation targeting central bank might find itself below π^*, or even below zero. However, should this happen, a credible commitment to the positive inflation target should keep the current *expected* inflation rate above the current *actual* inflation rate, leaving $r^e = i - \pi^e$ well below $r = i - \pi$.

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[61] The truth is not as one-sided as economists often pretend. For example, the front-loading of *real* mortgage payments in a conventional (nominal) fixed rate mortgage makes the *nominal* rate matter quite a lot to capital-constrained home buyers.

[62] When the core CPI inflation rate in the United States dipped to 1.3% in August 2001, the Fed voiced concerns about deflation and the zero lower bound. See Bernanke (2003). All the time of this conference, with *core* HICP inflation at 1.4%, the ECB should have been just as concerned.

Targeting the *price level,* rather than the *inflation rate,* provides even greater protection against getting trapped by the zero lower bound. Credible inflation targeting should engender expectations that π, which could go negative for a time, will converge upward to π^*. But credible price *level* targeting should engender expectations that π will actually overshoot π^* for a while in order to get the price level, p_t, back to its target path – thereby pushing π^e higher sooner. For this reason, the earlier verdict that inflation targeting is superior to price level targeting (Fischer, 1994) may need to be revisited for a world of very low inflation. Note, by the way, that adopting a price level target does not imply that the average inflation rate must be zero. The desired price level path can be defined to rise over time at some pre-determined inflation rate: $p_t^* = p_0(1+\pi^*)^t$.

Issue 16: Do the giant central banks have global responsibilities?

There is one last question that most central banks can answer quickly (and in the negative) but that giants like the Federal Reserve and the ECB (and perhaps the Bank of Japan and, one day, the People's Bank of China) must wrestle with: Should a central bank consider the welfare of other countries in making its *domestic* monetary policy decisions? Or, put slightly differently, do the Fed and ECB bear some responsibility for the health of the *world* economy?

Before addressing this question, let me make an important conceptual distinction analogous to the one made under Issue 14 (bubbles). In an interrelated world, what happens in Country B will reverberate somewhat on Country A. For that reason, the central bank of Country A must and will take events in Country B into account in formulating its own domestic monetary policy. To cite just one obvious example, forecasts of foreign economies are needed to generate a forecast of your own net exports. The question for this section is a different one: Should the central bank's objective function have some foreign (or world) variables in it? Or, put more concretely, might there be times when the Fed or the ECB should tighten or ease even though their own domestic economies are not calling for such action?

The case of the "25 basis points that saved the world" – the Fed's rate cut in September 1998, at a time when the U.S. economy was booming – brought this issue into bold relief. While Alan Greenspan was careful to justify the cut by fretting about possible infection from abroad, many observers at the time thought the Fed was doing its part to "save the world."

The question is a vexing one, and one major reason is legal. The Fed was created and derives its mandate from acts of the U.S. Congress; the ECB derives its authority and mandate from the Maastricht Treaty. In both of these cases, and in all others of which I know, the central bank's legal mandate pertains

exclusively to the domestic economy. Other than worrying about possible reverberations from various Country B's, what right, then, does either the Fed or the ECB have to take actions designed to help other countries? And if such actions run counter to domestic needs, has the central bank actually violated the law? These are serious issues.

But, on the other hand, an elephant walking through the jungle must take care where it steps. The European and American (and perhaps also the Japanese) economies are so large, and so important to both real and financial activity throughout the world, that it can be argued that good international citizenship gives them special responsibilities. That is why I raise the question, but do not answer it.

IV Monetary policy in the 21st century

With 16 different issues, it would be foolish to try to summarize all the arguments. Instead, let me use this concluding section to provoke discussion by offering overly-crisp and excessively definitive answers to the 16 questions posed in this paper – leaving out the nuances and counter-arguments.

Organizational structure

1 Monetary policy should target a *core,* not headline, measure of inflation and set the inflation target well above zero – say, at 2%.
2 Most central banks need to become more transparent in several dimensions. One is their forecasts, including conditional forecasts of their own behavior. However, a mechanical reaction function might do as an interim solution.
3 Inflation targeters should be more transparent about having an output or unemployment stabilization objective.
4 Monetary policy is best made by committees, but autocratically-collegial committees may not exploit the advantages of group decisionmaking sufficiently.
5 Nations should not exclude their central banks from bank supervision.

Operating principles

6 Central banks need to question their reasons for such extreme aversion to policy reversals.
7 On the other hand, we have, if anything, too many good explanations for the preference for gradualism.
8 Instead of scoffing at "fine tuning," perhaps some central banks should raise their aspiration levels.
9 Central banks should lead the markets rather than follow them.

10 There may be more scope for unsterilized foreign exchange intervention than current central bank rhetoric and practice admit.
11 Some central banks should begin thinking about conducting at least some of their open-market operations in derivatives.

Monetary transmission

12 Figuring out why the expectations theory of the term structure fails so badly is an urgent research priority for central banks.
13 So is the abject failure of uncovered interest parity.
14 Central banks should not use monetary policy to burst asset market bubbles.
15 Central banks should have contingency plans for dealing with the zero lower bound on nominal interest rates.
16 As the world continues to integrate economically, the ECB and the Fed (and eventually also the PBoC) may implicitly have to assume more global responsibilities.

Finally, I confidently predict that, five or ten years from now, some other scholar will have no trouble at all in formulating a list of 16 or more unresolved monetary policy issues. I just hope some of them are different from mine.

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Commentary on "Monetary policy today: sixteen questions and about twelve answers"

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It is indeed a pleasure to comment on such a challenging and thought-provoking paper. Unfortunately, I will not have time to go through all the very pertinent questions raised in the paper, so my remarks will be selective. The combination of theoretical and practical aspects in the paper reflects the remarkable progress of the dialogue between the academic and Central Bank worlds in the past 15 years or so. Changes on both sides have contributed to that development. The emergence of a new benchmark macro model that eliminates the LM curve and clearly establishes the interest rate as the monetary policy instrument, as it had usually been the practice of Central Banks, helped the connection with the practical side of things. In its dynamic version the new benchmark combines the methodology of Dynamic Stochastic General Equilibrium models that came from the Real Business Cycles school with the new Keynesian nominal rigidities and gives sense to the effects of money on the real economy through a more realistic transmission mechanism. Monetary policy affects prices indirectly through its effect on optimising consumption, investment and labour market decisions in the context of real and nominal rigidities. The output gap, representing the degree of slack in the economy, plays an important role in the model as an important channel on inflation and as a policy target. This avoids the assumption of a direct effect of money through a pure liquidity effect and corresponds better to the stylized fact that policy influences first the real side of the economy and then prices. The new approach also assumes the possibility of optimal Central Banks behaviour when policy is determined by a rule that comes from an optimization exercise and responds to inflation and a theoretically consistent output gap. All this helped the dialogue to which Central Banks contributed by beginning to commit to a more precise policy framework that includes the need to focus on the importance of expectations and to attempt to influence them by becoming more credible and transparent through appropriate communication.

This led to what the author in his latest book calls the "quiet revolution" in central banking.[1]

At the same time, we have observed a remarkable convergence of Central Bank practices in conducting monetary policy. Even when they profess different strategies, one can identify a common denominator, a set of general principles that seem to have universal acceptance. I group these under five headings:

1 First, the main goal of monetary policy has been more clearly defined as being price stability, meaning a low medium term objective for the inflation rate. Other objectives may be added, explicitly or implicitly, with different or equal weights in the objective function, but there is now no ambiguity about the main concern of policy.
2 Second, to form a view about the economic situation and the risks for inflation, a full information approach is adopted, and this means analysing the complete set of information variables. As Wim Duisenberg (2000)[2] expressed it once: "Monetary policy-making in the euro area has to reflect the complexities and uncertainties which surround the transmission mechanism of monetary policy … These uncertainties imply that no single approach is likely to be entirely reliable. … Reliance on a single indicator or forecast, or a single model of the economy or view of the world, would, in these circumstances, be extremely unwise. The strategy needs to incorporate the full range of relevant indicators and assess them in the context of a variety of different models". Even if the assessment is organized around two types of analysis, as it is the case in the Eurosystem, the aim is "the cross-checking of information in coming to its unified overall judgement on the risks to price stability"[3]. This is the way the issue is expressed in our May 2003 communiqué that clarified our basic policy framework. It also added that "the monetary analysis mainly serves as a means of cross-checking, from a medium to long-term perspective, the short to medium-term indications coming from economic analysis". It also stated: "Monetary analysis will take into account developments in a wide range of monetary indicators including M3, its components and counterparts, notably credit, and various measures of excess liquidity". This reference to many aggregates, including credit, is important, especially in view of the instability since 2003 of traditional money demand functions for M3, an instability that impairs monetary analysis[4]. From the point of view of the convergence of policy practices that I mentioned, it

1 Blinder, Alan S. (2004) *The quiet revolution: Central Banking goes modern,* Yale University Press.

2 Duisenberg, Wim (2000) "From the EMI to the ECB", Speech delivered at the Banque de France's Bicentennial Symposium, Paris, 30 May 2000.

3 "The ECB's monetary policy strategy", Communiqué of 8 May 2003.

4 See Avouyi-Dovi et al (2006) "La function de demande de monnaie pour la zone euro: un réexamen", Notes d'Études et de Recherche de la Banque de France.

is interesting to confront this with one of the criteria used by the Norges Bank, that epitome of inflation targeting, in "assessing whether a future interest rate path appears reasonable compared with the monetary policy objective". In fact, the 5th criterion asserts that "Interest rate setting must also be assessed in the light of developments in property prices and credit. Wide fluctuations in these variables may constitute a source of instability in demand and output in the somewhat longer run."[5]

3 Third, it is well established that the short-term monetary interest rate is an instrument of monetary policy and not any quantitative monetary variable. In addition, the strategy of using intermediate targets for monetary policy has been abandoned and the instrument is related with the final targets as Benjamin Friedman (1990)[6] recommended many years ago as a more efficient use of information. Here, we should note that the notion of an inflation forecast as an intermediate target put forward by Svensson does not contradict this because the forecast variable is directly related with the final target of policy.

4 Fourth, according to the new benchmark model, the transmission mechanism goes first through the real economic decisions of households and firms and only with a longer lag on prices. Also, the model gives great importance to expectations of future values for the relevant variables. With forward-looking rational agents, expectations of future policy influence present decisions and so problems of credibility become relevant for monetary policy. This implies that policy must adopt a forward-looking approach and that a focus on expectations is required. However, it should be clear that this does not imply that policy should follow market expectations, since this could entail serious dynamic instability and indeterminacy problems. Quite the contrary in order to influence expectations, monetary authorities must embark on effective communication with other economic agents and become more transparent about their own decision-making process in order to establish credibility.

5 Fifth, in spite of granting more importance to a rules-based orientation of policy no central banker will deny the need for some discretion in conducting policy in the face of real life uncertainties. As Alan Blinder put it in his previous book on central banking: "Rarely does society solve a time inconsistency problem by rigid precommitement or by creating incentive-compatible compensation schemes for decision makers. Enlightened discretion is the rule".[7]

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5 Norges Bank (2005) "Inflation Report" no. 1/2005, March.

6 Friedman, Benjamin (1990) "Targets and instruments of monetary policy" in B. Friedman and Frank Hahn (ed.) "Handbook of Monetary Economics", Vol. II, North-Holand.

7 Blinder, Alan (1998) *Central banking in theory and practice,* The MIT Press, page 49.

When mention is made of rule-based policy, we should not forget that there is a lot of confusion surrounding the word "rule". Theory talks about commitment to rules but that notion seemingly includes mere respect for a precise procedure in conducting monetary policy. Ben Bernanke and Frederic Mishkin (1997)[8] say, for instance, about inflation targeting that it "…does not represent an ironclad policy rule… Instead, inflation targeting is better understood as a policy framework". Even when Lars Svensson defines, for instance, "general or specific target rules" we see that he does not mean any sort of mechanical rule, but commitment to a framework that has been made more precise in some aspects but still allows room for exercising judgment.[9] In some circumstances, the "specific target rules" alluded to by Svensson may nevertheless be too rigid. The expression "constrained discretion" was coined to designate the current practice and at least for monetary authorities of big countries or big economic areas that is the name of the game.

The five points I have just described are not sufficient to characterize a policy framework and the missing details are the ones that are important to differentiate the various regimes in existence. I find that the questions raised by Alan Blinder in his paper concerning the "institutional design" and the "operating principles" as particularly apt to help us complete that task. As I will not comment on all those questions, I hope that my answers, plus the five points above help to convey my overall view on the way to conduct monetary policy.

Let me start then with the question about the specification of the objective function for monetary policy (Question 1). The formula presented in the paper is generally accepted and widely used and I have no qualms with it. Going further to a full specification of all the parameters is of course another mater. Fully specifying the objective function has been one of the recurrent recommendations of Lars Svensson in the context of the inflation target regime[10]. The only pragmatic version of that regime is the so-called "flexible inflation targeting" that takes into consideration the stabilization of the output gap. Consequently, the demand for a full specification is a way of defending the inflation targeting framework from the accusation of being misleading as, in spite of its name, it includes other targets after all. That is alluded to by Alan Blinder in the paper when he suggests the regime could as well be called "unemployment targeting" (see page 18) but has been used to justify a harsher criticism of inflation targeting by Jon Faust, Dale Henderson

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[8] Bernanke, Ben and Frederic Mishkin (1997) "Inflation targeting. A new framework for monetary policy?", *Journal of Economic Perspectives,* 11, pp. 97-116.

[9] Svensson, Lars (2003) "What's wrong with Taylor rules? Using judgment in monetary policy through targeting rules" in *Journal of Economic Literature* 41: 426-77.

[10] See the previous note and Svensson, Lars (2003) "The Inflation Forecast and the Loss Function," in Paul Mizen, ed. (2003), *Central Banking, Monetary Theory and Practice: Essays in Honour of Charles Goodhart, Volume I,* Edward Elgar, 135-152. Also available in http://www.princeton.edu/svensson/.

and Benjamin Friedman[11]. It is true that Svensson formally demonstrated quite a while ago (Lars Svensson, 1997)[12] that, when you have a model that makes the output gap a major determinant of future inflation, to define a longer period to achieve a pure inflation target in a gradual way is the same as putting the output gap in the objective function. In addition, many inflation targeters have made it explicit that they have a "flexible" framework, meaning that they do consider an objective of stabilization of the output gap. One can even go as far as recognizing that any monetary policy strategy that accepts that an indicator of the slack in the economy, like the output gap, has a major role in the transmission channels of monetary policy, implicitly includes the stabilization of that gap as part of its intermediate goals. In effect, from a long term perspective, stabilizing the output gap is a way of ensuring the elimination of both inflationary and deflationary forces. Nevertheless, in the short-term a trade-off may exist between the two gaps, inflation from its target and output from its potential. That trade-off may be related with the desired speed at which the economy converges to its long-term equilibrium or may result from considering that it is welfare-enhancing to avoid too much volatility of output (see Laurence Meyer, 2001)[13]. If the possibility of a short-term trade-off is accepted then a specification of λ would be useful.

I do not believe that it is possible or desirable to announce a full specification of the objective function. First, I think that it would be impossible or misleading to get a value for λ from a collective decision-making body. More fundamental though, I think it would not be advisable for the reasons that stem from the relationship established by Michael Woodford in his book[14] between consumer welfare and the form of the loss function to be adopted for monetary policy purposes. A major conclusion of his analysis is that the form of the loss function depends on the structure the economy considered in the model and on defining the transmission mechanism. Specifically, regarding the loss function in Blinder's paper, Michael Woodford shows that it is a reasonable approximation to the indirect consumer utility function if the following conditions are met:

a) There are no "welfare consequences of transaction frictions that account for the demand for the monetary base", which means the results apply to

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[11] Faust, Jon and Dale Henderson (2004) "Is inflation-targeting best-practice monetary policy?". And Friedman, Benjamin (2004) Comment on Faust and Henderson in *Federal Reserve Bank of St. Louis Review,* Volume 86, Number 4, July/August 2004, pages 117-149.

[12] Svensson, Lars (1997) "Inflation Forecast Targeting: Implementing and Monitoring Inflation Targets," *European Economic Review,* 41 (1997) 1111-1146. Also available on http://www.princeton.edu/svensson/.

[13] Meyer, Laurence H. (2001) "Inflation Targets and Inflation Targeting", Speech made at the University of California at San Diego Economics Roundtable, in http://www.federalreserve.gov/.

[14] Woodford, Michael (2003) "Inflation stabilization and welfare", Chapter 6 of *Interest and Prices,* Princeton University Press.

a "cashless limit" economy. Otherwise a term with an interest rate differential would have to be added to the objective function.

b) The only nominal distortion stems from sticky prices.
c) There are cost-push shocks.
d) Only monetary policy is considered. There is no consideration of cyclical fiscal policy.

Changes in this set-up may alter the form of the objective function. For instance, if there were no cost-push shocks, then there would be no trade-off between inflation and the output gap and the objective of the central bank would be just to eliminate the inflation deviation from its target. In the set-up under review, wages are considered flexible and prices follow the Calvo model of sticky prices, which implies that inflation variation results in distortions of relative prices and the welfare losses are proportional to the expected discounted sum of squared deviations of the inflation rate from zero. Nevertheless, as Woodford (2006) remarks, if different price adjustment schemes are assumed, the form of the function varies: "For example, if the probability of adjustment of an individual price is increasing in the time since that price was last reviewed – a specification that is both intuitively plausible and more consistent than the simple Calvo specification with empirical models of inflation dynamics – then welfare losses are proportional to a discounted sum of squared deviations of the current inflation rate from a moving average of recent past inflation rates, rather than deviations from zero. The goal of policy then should be to keep inflation from differing too greatly from the current 'inertial' rate of inflation, which implies that inflation should not be reduced too abruptly if it has been allowed to exceed its optimal long-run level".[15]

In addition, many empirical analyses have shown that wage stickiness is very important for the inflation process. If this is recognized, again the trade-off between the two gaps will be different. As Olivier Blanchard and Jordi Gali (2005)[16] showed recently, when real wage rigidities are introduced what they call "the divine coincidence" of stabilizing together the two gaps disappears. In that case and "in contrast with the baseline NKPC model, the divine coincidence no longer holds, since stabilizing the output gap ($\gamma - \gamma 2$) is no longer desirable. This is because what matters for welfare is the distance of output not from its second-best level, but from its first-best level. In contrast to the baseline model, the distance between the first- and the second-best levels of output is no longer constant".

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[15] Woodford, Michael (2006) "Rules for Monetary Policy" in NBER Reporter: Research Summary Spring 2006, on http://www.nber.org/reporter/spring06/woodford.html.

[16] Blanchard, Olivier and Jordi Gali (2005) "Real wage rigidities and the New Keynesian Model", NBER Working Paper no. 11806, November 2005.

As Woodford (2006) points out "If [prices and] wages are staggered in accordance with the Calvo specification, then the welfare-theoretic loss function includes a term proportional to the squared rate of goods price inflation and another term proportional to the squared rate of wage inflation each period. In this case, optimal policy involves a trade-off between inflation stabilization, nominal wage growth stabilization, and output-gap stabilization".[17]

Finally, there are two important issues related to the measurement and interpretation of the output gap. First, it is well-known that any output gap variable is very imprecisely estimated, particularly in real-time. Second, the theoretically consistent output gap that plays a central role in the New Keynesian literature bears little resemblance to the three empirical measures presented in the paper. The theoretical output gap is defined as the deviation of output from its equilibrium level in the absence of nominal rigidities. Given that the theoretically consistent output gap is model-dependant, this adds to the difficulty of defining a reliable and applicable objective function.

All this indicates that, as no Central Bank should be committed to a pure instrument-rule, in the same way it should not commit to and make public a precise objective function. In effect, if information changed about the transmission mechanism, the Central Bank should then have the opportunity of changing the parameters without facing the very difficult communication task of explaining that change.

Regarding the price index to use in the definition of the target for inflation I tend to sympathize with the author's position. To the arguments mentioned in the paper one could add that the same analysis by Woodford about the relationship between welfare and the loss function for monetary policy demonstrates that "If prices are adjusted more frequently in some sectors of the economy than in others, then the welfare-theoretic loss function puts more weight on variations in prices in the sectors where prices are stickier… This provides a theoretical basis for seeking to stabilize an appropriately defined measure of 'core' inflation rather than an equally weighted price index".[18]

There are nevertheless important practical obstacles to the use of a sort of core inflation index. First, the communication difficulties would be very significant and the principle of accountability to public opinion would be compromised as the general population is used to headline inflation, which is the general index that appears as relevant for daily life expenditures. Second, it would be difficult to assess the relative degree of price rigidity of all the goods composing

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[17] See note 15.

[18] See note 15. As Woodford notes, this result was first proven by Erceg, Henderson and Levin (2000) "Optimal monetary policy with staggered wage and price contracts", *Journal of Monetary Economics,* 46(2), pp. 281-313.

the HICP, in order to compute the "core" inflation aggregate. Actually, this core aggregate would only be theoretically adequate if price stickiness was the main nominal rigidity in the economy. Finally, I agree that a practical important implication of the choice of index is the degree of policy reaction to supply shocks that may affect the more volatile components that are normally excluded from a core index. In the Eurosystem we have dealt with the problem by allowing headline inflation to go temporarily above our definition of price stability without a monetary policy reaction when the increase in prices resulted from a recognized supply shock and second-round effects were not present. I think this is the appropriate way to deal with the question, and this puts me in the camp of those that Faust and Henderson (2004)[19] designate as LETers (Limited exploitable trade-off) instead of a NETer (Non exploitable trade-off) or, in the more colourful expression of Mervyn King, an "inflation nutter" aiming at reaching its target in every period. A strategy that is forward-looking and has a medium-term horizon for the achievement of its objective should be able to deal with this problem of supply shocks.

A final point about the objective function regards the consideration of other possible objectives of policy in the field of financial stability. The author's solution is to adopt a quasi-lexicographic approach: "The central bank minimizes (the objective function) unless serious financial instability arises, in which case it turns its attention to the latter" (page 11). This is coherent with the idea, defended in the paper in relation to asset price bubbles, that monetary policy should adopt a pure "mop up after" strategy when dealing with financial stability issues. I have doubts that this strategy is sufficient and I think that monetary policy should not forget completely about those issues in its regular functioning or at special turning points.

There is some ambiguity about the definition of financial stability but two main meanings stand out. One, more fundamental, follows Mishkin (1991)[20] and defines financial stability as a situation where the financial system is able to ensure in a lasting way, and without major disruptions, an efficient allocation of savings for investment opportunities. In another sense, financial stability refers to absence of a major misalignment of asset prices that can threaten future disruption of markets and the real economy. Both meanings are of course connected as they point to the same notion of smooth financial institution and market functioning. Consequently, I also deal with Question 14 in this point.

Traditionally, the dominant view was that asset price booms were associated with a general inflationary climate that fostered speculation against a background of expansionary policies. However, since the late eighties we have witnessed various episodes that contradict that old notion. Two types of analysis of structural devel-

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19 See note 11.

20 Mishkin, Frederic S. (1991) "Anatomy of financial crises", NBER Working Paper no. 3934.

opments in the financial system provide some understanding of recent events and question the conduct of monetary policy.[21]

The first approach has been developed in the BIS research, in particular by Claudio Borio and Philip Lowe (2002) and William White (2006).[22] The main idea is that under present circumstances, monetary stability is not enough by itself to ensure financial stability and may even contribute to unstable prices of financial assets. This contradiction seems to stem from the very success of monetary authorities in guaranteeing price stability in a credible way. The coexistence of an environment of low interest rates with future inflation expectations, well-anchored in the low levels defined by central banks objectives, would allow credit expansion that would fuel asset prices increases. If valid, this view would be very disquieting to central bankers because the traditional view has been exactly the opposite, i.e., that stability of prices of goods and services would stimulate market participants to concentrate on the real factors that affect the fundamentals of valuation of financial assets, thus contributing to low volatility in their respective markets. This view, which is certainly basically valid from a long-term perspective, is nevertheless not incompatible with the possibility that a short-term trade-off may exist between monetary and financial stability. That may be the case in particular in periods of transition after a long period of disinflation or when monetary policy starts to change the interest rate cycle after a long period of low rates.

The second view providing a broad explanation for the recent instability of asset prices has been put forward by Raghuram Rajan (2005),[23] in a recent noted paper. What came to be known as the "Rajan risk" is linked with the structure of incentives of managers and institutions in the new financial environment. The gain in importance of market-based non-regulated institutions and the reduced weight of traditional banking give prominence to compensation schemes more linked to returns which induces managers to enter into riskier transactions. Second, performances in these growing sectors of "investment institutions" tend to be measured essentially against peers and this fosters the herd behaviour already present in financial markets.

Both types of behaviour increase the probability of episodes of asset price misalignments. The system tends to assume more risks, including the so-called tail

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[21] In the following paragraphs, I use of parts of the text I delivered in another recent occasion. See "Finance and Regulation" a speech delivered on May 26th, on the occasion of the meeting of the European Association for Banking and Financial History (in http://www.bportugal.pt).

[22] Claudio Borio and Philip Lowe (2002) "Asset prices, financial and monetary stability, exploring the nexus" BIS working paper no. 114. White, William (2006) "Is price stability enough?" BIS Working Paper no. 205.

[23] Rajan, Raghuram G. (2005) "Has financial development made the world riskier?" NBER Working Paper no. 11728, November 2005.

risk where probabilities are low but losses can be high. Who would have thought some years ago that pensions funds and insurance companies would become participants in the market for risk of default of other firms? On the other hand, hedge funds manage nowadays many more assets than in 1998 and are involved in less liquid markets. Additionally, their returns have become more correlated across supposedly different types of funds and this seems to indicate that they could be subject to the same type of risks in a period of tighter credit and stressful equity markets.

This points precisely to accrued risks in periods of monetary policy transition. Central Banks should not ignore this possibility and in fact they usually take into consideration financial stability issues for which they are mandated. This is one of the reasons that explains why they embark into gradualism, interest rate smoothing and manage turning points of policy at a measured pace. More generally, financial stability concerns should not be ignored in the decision-making process even in more normal periods. As I mentioned a few years ago "…even without defining precise targets, interest rate policy, in certain circumstances, should 'lean against the wind' when it blows too strongly in asset markets" (Constancio, 2002)[24]. I do not recommend an aggressive approach to start bursting bubbles or to include a term with asset prices in the objective function, but we should not ignore the problem altogether when is starts to emerge, without having the illusion that monetary policy could provide the whole solution. The problem will have to be addressed by other instruments, like regulation and supervision. As far as monetary policy is concerned the full-information approach that I described as one of the five main principles in the conduct of monetary policy may be particularly useful here. In particular, looking to developments in credit aggregates may be informative, precisely because, as suggested by research done in the BIS, buoyant credit expansion is normally – albeit not always[25] – associated with asset prices booms.

The existence of the sort of short-term trade-off that we are considering may create significant problems for the inflation targeting monetary policy regime. This framework is by definition very much attached to targets and forecasts for inflation as an almost exclusive basis for decisions, and therefore has difficulty incorporating other considerations into the decision-making process without losing some credibility. The notion that this can be overcome by extending the horizon of the inflation forecast by a number of years does not look realistic and has not been attempted. Very interesting, however, is the addition made by the Central Bank of Norway to the list of criteria to assess future interest rate policy that I

[24] Constancio, Vítor (2002) "Policies and institutions for global financial stability" in 8th International Financial and Economic Forum, Vienna, November 2002.

[25] For instance, in the case of Portugal we had high credit growth in the second half of the 90's but there were no asset price bubbles either in the stock market or in housing.

mentioned earlier. The addition refers to the need of considering asset prices increases and aggregate credit growth. Of course, this criterion, although subordinate, only adds to the difficulty of the framework to fend off the accusation of having multiple objectives hidden behind a single denomination of "inflation targeting" without the transparency of disclosing the exact criteria that may justify a temporary deviation from the main target. A disclosure, let me add, that I would consider virtually impossible or unwise to make.

An important argument that Alan Blinder uses to defend his view on asset price bubbles is that the "mop up after" strategy "worked extraordinarily well" in the context of the stock market bubble of the late 90's. It should be remembered though that it worked well for the economy because of the very expansionary fiscal policy and the wealth effects on other asset markets (bonds and real estate) induced by the very aggressive monetary policy. The final result is that the so-called global imbalances are still with us and no one knows how their winding down will play out.

This discussion highlights the importance I attach to financial stability as one of the core mandates of any Central Bank. In this context, I agree with Blinder's conclusion that important supervisory responsibilities should remain with Central Banks (Question 5). This conclusion stems directly from the strong complementarities that exist between the macroeconomic prudential surveillance framework and microeconomic supervisory responsibilities. On the subject of the counterarguments based on the idea of a conflict of interest with monetary policy let me add just two comments. The first, that it is illusory to think that this possible conflict would disappear just by separating and giving the two functions of supervision and monetary policy to different institutions. The second, to underline the fact that the possibility of that conflict does not exist in the euro area because National Central Banks that are responsible for supervision do not decide alone the single monetary policy and are not in full control of money creation.

On *transparency* (Question 2), I agree that the trend is irreversible in the direction of wider disclosure by Central Banks of their procedures. Transparency about goals and about methods can be beneficial to monetary policy because expectations are such an important channel of transmission. Expectations about future policy and future inflation affect today's decisions on wages and prices and those expectations depend on the economic agents' view of future monetary policy. So, I agree with the author on most of the points he makes about these issues. Regarding the methods of published inflation forecasts and the treatment to be given to the future path of interest rates, I think that taking into account the path indicated by the financial markets is an adequate solution. It is logically consistent, it is transparent and in the case of the Eurosystem cannot lead to any sort of dynamic inconsistency as in our framework the staff forecast is just one element, albeit an important one, in the whole information set that we consider in our de-

liberations. Contrary to the inflation-targeting regime, there is no commitment to a direct link between the projections and our decisions on interest rates.

On transparency regarding the decisions and the decision-making process, I share the arguments that justify in our case the non-publication of minutes with the indication of individual votes. The young age of our project and its supra-national nature would create risks of great pressure from national public opinions on the vote of national Governors. With time and the consolidation of our institutions, I am open to reconsider my opinion on this issue.

I have already expressed a number of opinions on the inflation targeting regime that should be enough to reach the conclusion that I do not favour the adoption of a fully-fledged version of that framework in big economic areas (Question 3). In relation to small countries and in particular emergent ones, I accept that the regime may be useful because it provides a level of commitment that fosters the required credibility for Central Banks. In the case of big developed areas without significant credibility problems, the regime, the way I see it, has some costs and unnecessary rigidity. This opinion is very much dependent on my definition of an Inflation Targeting Framework (ITF). Alan Blinder in his paper states that the "essence of inflation targeting is announcing a numerical value for π^* and being transparent about it". There are some definitions of an ITF that add very little to this requirement to characterize the regime, appending only aspects of transparency and communication regarding methods and decisions. If that would be enough for a definition then the Eurosystem could be included as an inflation targeter, which would come as a surprise to many insiders. In fact, that definition is too broad to be useful. Lars Svensson, the author that best theorized the regime, distinguishes between "general targeting rules" that specify "the objectives to be achieved, for instance, by listing the target variables, the target levels for those variables, and the (explicit or implicit) loss function to be minimized", and "specific targeting rules" that specify "operational conditions for the target variables (or forecasts of the target variables)".[26]

These specific rules are essential to characterize a "flexible" inflation target regime and they may consist either in a principle, announced by several Central Banks, that the interest rate should be adjusted such that the resulting inflation forecast at an appropriate horizon (usually about two-years ahead) is on target, or they may specify operational Euler conditions for monetary policy. "In particular, an optimal targeting rule expresses the equality of the marginal rates of transformation and the marginal rates of substitution between the target variables in an operational way" (Svensson, 2003).

It is the important role attached to inflation forecasts and the commitment to move rates in reaction to them that really differentiates the ITF from other monetary strategies. My general assessment is that even if, as Svensson underlines, judg-

[26] See Svensson, Lars (2003) in note 12.

ment exercised by the Central Bank enters into the elaboration of those forecasts, the scheme is not as totally clear as it proclaims to be and may be too rigid at certain moments.

As I have already mentioned, there is a difficult coexistence between the name "inflation targeting" and the multiple goals (real and/or financial stability) that are alluded to and with the claim of total transparency and credibility. The problem gains practical importance when we ask: how far and how long a deviation from the inflation target will be allowed to accommodate other objectives? There is no criterion (transparent or otherwise) to answer this question. Other regimes also leave a margin of ambiguity but do not claim that their credibility depends on their transparency and the precision of the rule they follow. Could it be that the ITF falls into the category of those who apply the sort of "folk wisdom" that maintains that Central Banks should "do what they do, but only talk about inflation".[27]

On the other hand, the strict link between forecasts and decisions can create credibility problems either when rates are moved beyond what the forecasts indicated as appropriate or when rates are moved only because of the forecasts even if other obvious aspects of the situation would justify a delay. Both situations have occurred in practical experience and may constitute a source of problems, especially if the interest rates considered for the forecast are the conditional indication of the decision-making body about its own future policy.

The operational problems related to gradualism and fine tuning (Questions 7 and 8) are very well dealt with in the paper. I agree that there are many and good arguments that make gradualism in moving interest rates the rational attitude to have. Keeping an option value in the face of a continuous flow of data and the objective of smoothing rates seem to me the most cogent ones. Regarding "fine tuning" I do not follow the paper in trying to keep open the possibility of Central Banks becoming somewhat bolder in pursuing it. In general, the arguments to be usually prudent in rate decisions rest on the pervasive uncertainty that constitutes the background of monetary policy. We have data uncertainty, parameter uncertainty and model uncertainty. There are methods to help us to overcome the consequences of these sources of uncertainty but they have great limitations and, in general, they lead to caution. The possibility of destabilising markets or the economy by taking quick and strong action is just too big to be risked. Naturally, extraordinary circumstances may well justify decisive action in a short period of time. Let me add another word of caution regarding methodology. It is not easy to decide if a Central Bank is being too cautious or not. Using Taylor-type estimated interest rate rules to assess and compare the behaviour of Central Banks in this regard can be misleading. The coefficients obtained are a mixture of structural parameters of the economy and an expression of the au-

[27] See Faust, Jon and Dale Henderson (2004) in note 11.

thorities' preferences. For instance, if prices are more sticky (as they are in Europe) interest rate moves have a bigger effect on the real economy. On the other hand, in that case fluctuations of inflation will more easily distort relative prices and lead to more welfare losses. These aspects may lead to an estimate of a Taylor rule with a somewhat low output gap coefficient that would not be solely the reflection of the authorities' preferences but the consequence of how the economy reacts. This means that we should be very cautious in accepting conclusions from this type of analysis, which is very common in trying to determine if some Central Banks are being more or less gradualist than others.

As for the problem of deciding if Central Banks should lead or follow the financial markets (Question 9) I totally agree with position expressed in the paper. Alan Blinder has written extensively on this question, stressing the risk of dynamic instability and the need for Central Banks to be independent from markets. I just want to add the remark that the alternative is not for Central Banks to be too ready to disappoint or surprise markets. Central Banks should be predictable. The point then is to be able to permanently explain the framework used to decide on monetary policy and influence market expectations. Good communication is therefore essential and can produce the desired results, as happened last April when our communication was able to change market expectations that were being carried away by rumours. As Blinder says at the end of his latest book: "Going modern need not and should not mean relinquishing the role of leader to the financial markets. Monetary policy decisions are, in the end, public policy decisions and, as such, are not suitable candidates for privatisation"[28]. In paying tribute to the good work Alan Blinder has done in his writing about central banking I think that this is a very appropriate quotation to end my comments.

[28] See note 1.

Commentary on "Monetary policy today: sixteen questions and about twelve answers"

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I Introduction

Let me start by saying a few words of thanks and extending my best wishes to this great institution, which is celebrating 150 years of bearing the prestigious name of Banco de España. I would like to thank Governor Caruana and the Banco de España for organising this excellent conference and for inviting me to participate in this panel.

To kick off this conference, Alan Blinder has prepared an impressive survey which presents and assesses the main critical issues that are currently truly relevant for monetary policy-makers. He has demonstrated again an admirable ability to blend top academic research with good central banking practice and common sense to produce this insightful and stimulating review. Alan's list of 16 questions regarding monetary policy is fairly long and, indeed, somewhat longer than the list he presented in 1999 at the first ECB conference. This may seem discouraging and might suggest that not much progress has been made over the past six years. However, the two lists are not identical: some of the original questions have been resolved, and new ones have arisen. Therefore, there are still plenty of critical issues concerning the science and art of central banking that need to be addressed, and Alan himself provides answers to most of them.

Given the wide range of questions raised by Alan, I will inevitably have to be selective and do some cherry-picking, by focusing on issues that are more controversial or more interesting from my perspective, and that can also be discussed adequately in the limited time available. I will discuss a number of issues regarding the objectives and strategy of monetary policy, aspects of policy implementation including central bank communication and transparency, the relationship between monetary policy and financial markets, and the implications of globalisation for monetary policy.

II Monetary policy objectives: some fundamental, strategic and analytical issues

I would like to begin by addressing some critical questions concerning the institutional design of monetary policy, in particular issues relating to monetary policy objectives. These include fundamental issues regarding the choice and ranking of policy goals, as well as other important subjects pertaining to the strategy and analysis employed in pursuing these goals.

A fundamental development in monetary policy-making over the past two decades has been the emergence of a strong consensus – or at least a general acceptance of the view – that the overriding aim of monetary policy should be the attainment and preservation of price stability. This view is shared by an overwhelming majority of central banks and academic economists. It is presumably also shared by the political authorities, as manifested by the legislation that has been enacted in many countries to enable central banks to pursue this objective. The roots of this consensus are:

1 The greater appreciation of the benefits of price stability for durable economic growth and social welfare;
2 The recognition that monetary policy can effectively determine price developments over the medium and longer run, but cannot permanently and systematically influence economic activity;
3 Growing evidence that independent central banks can pursue price stability effectively while minimising output volatility.

Despite the general agreement on the primacy of price stability as a monetary policy objective, there are differences of opinion on several related issues:

1 How this goal is linked and ranked relative to other policy objectives;
2 What is the appropriate strategy for policy formulation;
3 Whether and how the concept of price stability should be defined in quantitative terms;
4 How to operationally specify a final policy target and in particular the measures of inflation and economic activity that central banks should aim to control. These differences are not inconsequential for the formulation and conduct of monetary policy.

The central bank's objective function

In examining these issues, Alan uses, for part of his analysis and assessment, an objective function for monetary policy that is often employed in academic

work: a quadratic loss function that penalises a weighted average of the deviations of the inflation rate (π) from its target value (π^*) and the deviation of real output (y) or the unemployment rate (u) from their "equilibrium" or "natural" values (y^*, u^*). Although, as Alan acknowledges, this particular specification of policy-makers' objectives is motivated (if not dictated) by "mathematical convenience" (in the theoretical analysis of monetary policy, given that it facilitates the derivation of results, especially under conditions of uncertainty, the fact is that it imposes unrealistic constraints on policy-makers' preferences and does not appropriately describe the objectives of many central banks, including the ECB.

In the case of the ECB, the Treaty establishing the European Community states that "the primary objective of the ESCB shall be to maintain price stability" and that, "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", which include a high level of employment and sustainable and non-inflationary growth. In the euro area, monetary policy goals are therefore not stated, and cannot be expressed in terms of their relative importance (which, in principle, cannot be captured by choosing the size of the parameter λ defining the relative weight), but are clearly specified in a hierarchical (or lexicographic) manner, which emphasises the overriding importance of price stability and also implies that policy should not be formulated in terms of an objective function which trades off inflation volatility against output volatility. The underlying proposition is that, in general, price stability contributes to reducing output volatility.

I should also briefly mention that the selected loss function does not seem to be able to capture the points raised by some economists concerning the potentially asymmetric costs of high and low unemployment, relative to its natural or NAIRU level. It is also unclear as to whether it can provide an appropriate representation of policy preferences for those central banks that have opted for an inflation-targeting strategy and at the same time aim to support a high level of economic activity. This observation partly relates to the specific functional form and partly to the results of Svensson (1997), who has shown that the parameters of a Taylor rule are not related in a straightforward way to the relative weight λ of inflation and output deviations from their target values.

Monetary policy strategy and the operational target for price stability

Given the choice and ranking of objectives, a key aspect of the policy framework is the strategy adopted for pursuing them, which involves decisions concerning the method of analysis and the quantitative definition and operational

target for price stability. The approaches chosen by central banks differ, but they are converging. Many central banks have opted for an inflation-targeting strategy based on a single analytic model and aimed at an inflation rate of 2% or 2.5% as the midpoint of the target range. The ECB has adopted a more general and eclectic strategy that includes both economic analysis and monetary analysis. It has also adopted a quantitative definition of price stability – an increase in the price level that does not exceed 2% – and, given this definition, it aims to maintain inflation at "below but close to 2%". The Federal Reserve has not yet formally adopted a precise, operational price stability or inflation target (though implicitly a target for core inflation at 1.75% – 2% has recently been used). We have found the selection and announcement of a quantitative definition of price stability extremely important for policy formulation as well as for guiding and anchoring inflation expectations to price stability. Moreover, it provides a yardstick for the assessment of the effectiveness of monetary policy and for democratic accountability.

However, despite the adoption of a quantitative definition of price stability to orient our policy, the ECB does not use the term "inflation targeting" to describe its own strategy – even if Alan tends to put us in the same camp. Presumably, there must be some real differences warranting this position, and indeed there are. First, for the Governing Council of the ECB, inflation projections based on a single model are not the only all-encompassing tool on the basis of which decisions and communication are organised; our projections are seen as important input to our economic analysis, but are strictly staff projections and one element of our economic analysis. A second major difference is that we assign an important role to monetary analysis in assessing the medium to long-term inflation trends and risks. A final point is that our policy framework has a medium-term orientation but we have eschewed specifying a fixed time horizon for our assessment of the outlook for price stability.

At the same time, there are no major differences in the practical implementation of monetary policy strategies among price stability-oriented central banks and, with regard to at least some aspects of the policy framework, remaining differences are diminishing. In recent years, for example, we have observed a greater focus by some inflation-targeting central banks on the medium and long-term horizon and on the role of money and credit growth in determining medium to long-term inflation trends and in influencing asset price dynamics.

Core versus headline inflation

Despite the convergence of many aspects of the monetary policy strategies, there are still important differences. One such difference is whether the operational target for inflation should be the headline or a core measure of inflation. Alan has

declared that he is firmly in the "core" camp for several reasons. He argues that a central bank should aim at core inflation because:

1 It cannot effectively control headline inflation given its inability to offset supply shocks;
2 It can better forecast future headline inflation on the basis of past core-inflation dynamics, and
3 Targeting core inflation is likely to result in more sensible monetary policy in the presence of supply (energy price) shocks.

In this debate, I am firmly in the "headline inflation" camp. Let me explain. To begin with, our responsibility as central bankers is to preserve the stability of the overall, general price level which determines the public's purchasing power and social welfare. The inability to offset immediately supply-side shocks does not change this responsibility, while the medium-term orientation of our monetary policy clearly indicates that we do not aim to offset such unanticipated shocks over the short run. I believe it is important to differentiate the role of a core inflation measure in the definition of the central bank's objective from its relevance and potential usefulness in the assessment of the outlook for price stability and the formulation of policy. With regard to the monetary policy strategy, the price index used to define the medium-term objective should be a comprehensive and credible measure of citizens' purchasing power which cannot be criticised for being defined in an arbitrary manner. Core inflation measures fall short of this requirement because of the exclusion of important items relevant for the public and because of the degree of arbitrariness in the definition of core inflation.

Another issue concerns the use of an appropriate measure of core inflation as an information variable in the formulation of monetary policy. There are two pertinent questions: first, which measure of core inflation provides reliable information about domestic underlying inflationary pressures by removing short-term noise from headline inflation due to transitory shocks, and second, whether different measures of underlying inflation can better forecast developments in headline inflation.

Many concepts of core inflation have been proposed, such as HICP inflation excluding energy and food components, trimmed means of the HICP sub-indexes and model-based measures. While the proposed different core measures can be helpful in removing transient noise from trend inflation, there is no strong evidence in the euro area that a specific core inflation measure is a reliable tool for forecasting headline inflation at relevant horizons. Our experience and analysis leads to different conclusions than those derived from the US experience cited by Alan (see Blinder and Reis, 2005). In the euro area, the gap observed between headline and core inflation often closes with core inflation increasing and converging towards higher headline inflation.

For example, in the euro area in the period 1999-2002, a considerable positive gap opened up between the headline inflation and the underlying measure which excludes food and energy prices. However, following a period of strong demand growth, this gap was closed not by a significant drop in headline inflation, but by a delayed upward movement in this "core" measure. Following the indication of the core measure on this occasion would have been a costly policy mistake (see ECB, 2005).

This episode shows that the usefulness of core measures might be generally limited, and that medium-term inflationary pressures are very much related to various underlying causes and processes as well as to the nature and dynamics of the shocks affecting the economy. Consequently, the optimal monetary policy response cannot be determined on the basis of a simple rule relying on a measure of core inflation; it depends on the size, nature and persistence of shocks affecting the economy. And such shocks cannot, in general, be identified and their effects cannot be adequately assessed only by using a measure of core inflation.

A point that should be emphasised with regard to the appropriate response of monetary policy to supply shocks is that their ultimate effects on inflation and output dynamics will obviously and crucially depend on the reaction of economic agents, especially of the participants in product and labour markets, which is influenced by their expectations about the response of the central bank to such disturbances. The fact that no significant second-round effects have been observed in the recent past does not imply that they will not emerge in the future, if an accommodative monetary policy is maintained, especially as the economic recovery gains momentum. If a central bank adjusts the monetary policy stance only when second-round effects have become clearly visible, by relying on some measure of core inflation, its response will come too late and it is likely that a larger dose of monetary tightening would be required than would have been the case if it had adjusted earlier on the basis of its assessment of all pertinent risks to future headline inflation.

The strategy of the ECB, therefore, relies on a comprehensive analysis of the shocks affecting headline inflation as well as on a wide variety of economic indicators and methods of analysis in order to assess the outlook for price stability over the medium term. And, importantly, the medium-term orientation of the ECB's monetary policy strategy ensures that in our assessment we appropriately discount short-term volatility due to transitory supply shocks.

III Central bank transparency and communication of future policy rates

The second big theme I want to address is central bank transparency and, in particular, Alan's suggestion that central banks should announce their conditional

monetary policy plans, at least as part of their forecasts. When discussing the issues of transparency and communication, it is important to distinguish between general aims and principles, on the one hand, and practical and effective means of fulfilling them, on the other.

I fully agree with Alan on the importance of, and the reasons for, (maximum) central bank transparency and I partly share his view on the limits to (optimal) transparency. But I draw different conclusions about the usefulness of pre-announcing an explicit path for future policy rates over a period of one to two years. This is because of my different assessment of the nature and extent of the uncertainty we face, the quality of available information and the limitations to our analytical methods, which have implications for the effectiveness of Alan's proposed communication strategy.

A high degree of transparency is an essential element of the democratic accountability of central banks. Transparency also enhances the effectiveness of monetary policy by helping to guide the expectations of economic agents and bring them into line with policy objectives and actions. It is particularly important that markets and the public at large have a good understanding of the systematic and conditional conduct of monetary policy by the central bank, so that expectations about future price developments and the path of policy rates are in line with the central bank's mandate. For all these reasons, the ECB has always striven to be as transparent as possible and has tried to communicate clearly, and by a variety of means, its policy objective, its strategy, its assessment of the economic situation, as well as the outlook for price stability and the associated risks.

The limits of central bank transparency

Are there limits to the transparency of central banks? Alan's view on this issue is nicely presented by paraphrasing Einstein: "Every central bank has to be as transparent as possible, but not more so." The crucial issue is the meaning or interpretation of "but not more so". Alan argues that the meaning of this proposition is that the default option should be disclosure, unless there are good reasons for the central bank to maintain the confidentiality of certain information in its role of supervisor or fiscal agent.

In my view, there is another interpretation of the meaning "but not more than possible", which takes into account the limitations of our analytical tools and the uncertainty surrounding the medium to longer-term outlook. This interpretation also relates to the second objective of transparency, which is to provide economic agents with useful information so as to enhance clarity and understanding about policy actions and to reduce pertinent uncertainty. If future policy actions over a fairly long time horizon depend on projections about the future paths of many

exogenous variables that are inevitably characterised by uncertainty, as well as on various shocks that by definition cannot be anticipated, and, more importantly, when there is considerable uncertainty about certain structural or behavioural parameters of the economy, then providing explicit guidance on the future policy rates, conditional on the underlying projections and assumptions, generally involves risks that can undermine the usefulness of providing more information on the central bank's policy intentions.

Let me elaborate on some of the risks. First, the general public may fail to fully understand that a pre-announced path of future policy rates is conditional and that changes in the state of the economy will require changes to this policy path. Eventual deviations from the previously projected policy path may therefore be viewed, at least by many who are not experts in monetary economics, as a failure of the central bank to follow its announced intentions. This could damage its credibility, even if it is conducting policy in an optimal manner. Second, the central bank is often faced with a high degree of uncertainty, including "Knightian" uncertainty, about the functioning of the economy and the response of economic agents to shocks and policy actions. Under such circumstances, it is difficult to determine an optimal or appropriate path of policy rates over a long time horizon and to agree about such a policy path in a policy-making committee, and to properly convey to the public all the conditions underlying such a path. Finally, I do not think that publishing a path of future policy rates, which is mechanically derived from an empirically estimated reaction function, would be helpful. On the contrary, it would be difficult to explain the difference between this path and the one decided by the decision-making body in the context of a forward-looking strategy with a medium-term orientation. Confusion rather than greater clarity may be the outcome of implementing such an approach.

For this reason, I suggest that a central bank should be as transparent as possible, but no more so than is realistically useful for enhancing the clarity and understanding of the future monetary policy stance.[1] This does not mean that central banks cannot give qualitative guidance about the future policy stance by means of official statements, particularly in special circumstances when the size and balance of risks to the outlook for price stability dictates the provision of such guidance or when the central bank believes that market expectations about future monetary policy are deviating significantly from its policy intentions as determined by its own assessment.

However, I share some of Alan's considerations on the limits and drawbacks of macroeconomic projections based on a constant interest rate assumption. As you know, in order to improve the overall consistency and forecast quality of the Eu-

[1] This view is closer, though not identical, to that suggested by Mishkin (2004), p. 50.

rosystem staff macroeconomic projections, we recently decided to change the assumption about the future path of short-term interest rates that is incorporated in the staff projections. With the projections released today, we have started to produce macroeconomic projections that are conditional on the path of future interest rates expected by the markets, as embedded in the yield curve and in futures prices. This approach corresponds to the second option in Alan's paper and addresses the concerns expressed by eliminating an internal inconsistency and improving transparency. It will not solve all of his concerns, but it should mitigate some of them.

IV Monetary policy and asset prices

I will turn now to the questions in Alan's list that concern the relationship between monetary policy and financial markets. In Question 14, Alan asks: how should central banks react to asset price bubbles? To answer this properly, I would need at least another 20 minutes. Unfortunately, I do not have that much time, but let me make two remarks.

First, I agree with Alan that asset price bubbles are difficult to identify in real time and are thus often only identified ex post. This notwithstanding, it appears to me that there are a number of tools that can help identify the emergence of bubbles. The ECB does not target asset prices, but pays close attention to asset price movements with a view to preserving the stability of consumer prices over longer horizons. In this regard, the role of money and monetary analysis in the ECB's strategy helps us to assess developments in asset prices and the degree to which they pose a risk to price stability over the longer term.

Second, excessive appreciations and subsequent rapid reversals in asset prices could have very high costs for price stability and for the real economy. Therefore, a policy of only "mopping up after" – to use Alan's terminology – could have worked on some specific occasions, but this may not always be the case while, at the same time, it might create moral hazard problems. In light of this, a central bank may want to consider a policy of carefully "leaning against the wind" under certain, clearly exceptional, circumstances. It would then adopt a somewhat tighter policy stance in the face of an inflating asset market than would otherwise be the case if confronted with a similar macroeconomic outlook under more normal market conditions. Given the uncertainty surrounding the appropriate monetary policy stance under such circumstances, it could consider to err on the side of caution by trying to avoid feeding the bubble with an overly accommodative policy. These issues, which have been extensively discussed, deserve further analysis and consideration.

V The implications of globalisation for monetary policy and the global responsibilities of central banks

My final remarks relate to the last, very challenging and open question raised by Alan on the global responsibilities of the main central banks. This is an important question that cannot be answered in a simple, straightforward manner and in a limited period of time. And Alan does not provide an answer, either. I would like to pose, however, a set of related questions on the implications of globalisation for monetary policy. In a globalised economy, should the role and orientation of monetary policy be changed? Should the framework for analysis and policy formulation be amended? Is the required analysis for setting policy becoming more demanding? The direct and brief answers I recently gave to these questions are: no, no and yes to some extent.

It is sometimes argued that the monetary policy of a major central bank should help guide the domestic economy's adjustment to the evolving global economic environment and the competitive pressures associated with globalisation; and that it should foster the adjustment of global imbalances and even assume responsibility for the smooth functioning of the global economy. In my opinion, globalisation does not affect the central role and overriding responsibility of central banks to preserve price stability "at home". On the contrary, maintaining price stability in a rapidly evolving, globalised economy that may influence the dynamics of inflation in various ways becomes more essential and challenging, particularly in situations where adverse inflation shocks or inflationary pressures in some economies are now more easily transmitted to others.

Consequently, if the primary objectives of monetary policy are unaffected by globalisation, the appropriate strategic framework for analysis and policy formulation should remain the same. However, the analysis required for policy formulation will have to carefully take into account the various effects of globalisation on the dynamics of inflation, economic growth and asset prices. For example: in the a globalised economy, traditional measures of core inflation are even more difficult to interpret and use as indicators of underlying domestic inflationary pressures; the estimates of potential output are more difficult to calculate in a robust manner; and the measurement and usefulness of output gaps are subject to greater uncertainty than is usually the case. Consequently, our role and responsibilities as central bankers are fundamentally the same in the globalised economy, but the performance of our tasks may be becoming more challenging. Having said that, I would agree that other pertinent issues raised by Alan deserve careful consideration.

VI Concluding remarks

Clearly, there are many questions still to be answered, and challenges to be addressed. We should, however, also not forget that during the last two decades, industrialised countries have experienced a marked reduction in the average level of inflation and in the volatility of both output and inflation. I have no doubt that improved economic policies, and better monetary policy in particular, have contributed, perhaps largely, to this development, and despite the room for potential further improvements, as suggested by Alan. On this optimistic note, which befits such a celebratory conference, I should like to conclude.

Thank you for your attention.

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Commentary on "Monetary policy today: sixteen questions and about twelve answers"

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In recent days, we have seen a retrenchment of investors from a broad range of risky assets, especially emerging market debt and equity. While there are ex-post facto explanations for each country as to why investors were on a selling spree, a graph of the stock market index run up from January 2004 to the peak in 2006 against the fall since that peak to date is a pretty significant straight line – the more markets went up, the more they fell. The most widely accepted explanation seems to be changing "risk aversion". Investors were risk tolerant while pushing up markets, and suddenly became risk averse. Like most facile explanations in the markets, this one illuminates little. Why were investors so foolhardy then, and so scared now? What made them change?

I will argue in this talk that much of what is termed changes in "risk aversion" is likely to be changes in the structure of incentives and resulting behavior of investment managers – by "investment manager" I mean managers of financial assets ranging from those running insurance companies to those running venture capital and hedge funds. A primary driver of these changes is likely to be a change in the stance of monetary policy. Monetary policy thus might have effects outside the traditional channels, though the behavioral channel will amplify traditional effects. I will discuss what all this might imply for policy making.

Examples of greater risk taking in a low interest environment

Let me start by offering two examples of why institutions may take more risk when interest rates are very low and reverse that when interest rates are high. The

[1] The following reflects my views only and are not meant to represent the views of the International Monetary Fund, its management, and its board. I thank Charles Collyns, Graham Hacche, and Laura Kodres for useful comments.

first, traditionally known as "risk shifting", is well known. When an insurance company has promised premium holders returns of 6 percent, while the typical matching long-term bond rate is 4 percent, it has no option if it thinks low interest rates are likely to persist, or if it worries about quarterly earnings, but to take on risk, either directly or through investments in alternative assets like hedge funds. All manner of risk premia are driven down by this search for yield and thus risk.

A second example is that of hedge funds themselves where a form of induced "risk shifting" can be seen. The typical compensation contract for a hedge fund manager is 2 percent of assets under management plus 20 percent of annual returns in excess of a minimum nominal return (often zero). When risk free returns are high, compensation is high even if the fund takes on little risk, while when risk free returns are low the fund may not even exceed the minimum return if it takes little risk. Thus low rates will increase fund manager incentives to take on risk. Furthermore, since the cost of borrowing can also be low at such times, fund managers can goose up returns by adding leverage. In doing so, they further add to risk

Alpha and Illiquidity Seeking

The two examples are a little different. In the first case, procyclicality of risk taking behavior is induced by the level of interest rates because of the nature of pre-contracted liabilities. In the second, procyclicality is induced by the nature of compensation. I want to explore the incentives induced by compensation more generally. To do this, I will first describe the very practical theory behind how investment managers are compensated.

The typical manager of financial assets generates returns based on the systematic risk he takes – the so called beta risk – and the value his abilities contribute to the investment process – his so called alpha. Shareholders in any asset management firm are unlikely to pay the manager much for returns from beta risk – for example, if the shareholder wants exposure to large traded U.S. stocks, she can get the returns associated with that risk simply by investing in the Vanguard S&P 500 index fund, for which she pays a fraction of a percent in fees. What the shareholder will really pay for is if the manager beats the S&P 500 index regularly, that is, generates excess returns while not taking more risk. Indeed, hedge fund managers often claim to produce returns that are uncorrelated with the traditional market (the so-called market neutral strategies) so that all the returns they generate are excess returns or alpha, which deserve to be fully compensated.

In reality, there are only a few sources of alpha for investment managers. One comes from having truly special abilities in identifying undervalued financial assets – Warren Buffet certainly has these, but study after academic study shows that very few investment managers do, and certainly not in a way that can be predicted before the fact by ordinary investors.

A second source of alpha is from what one might call activism. This means using financial resources to create, or obtain control over, real assets and to use that control to change the payout obtained on the financial investment. A venture capitalist who converts an inventor, a garage, and an idea into a full fledged profitable and professionally managed corporation is creating alpha. A private equity fund that undertakes a hostile corporate takeover, cuts inefficiency, and improves profits is also creating alpha. So is a vulture investor who buys up defaulted emerging market debt and presses authorities through various legal devices to press the country to pay more.

A third source of alpha is financial entrepreneurship or engineering – investing in exotic financial securities that are not easily available to the ordinary investor, or creating securities or cash flow streams that appeal to particular investors or tastes. Of course, if enough of these securities or streams are created, they cease to have scarcity or diversification value, and are valued like everything else. Thus this source of alpha depends on the manager constantly innovating and staying ahead of the competition.

Finally, alpha can also stem from liquidity provision. For instance, investment managers, having relatively easy access to finance, can hold illiquid or arbitrage positions to maturity: if a closed end fund is trading at a significant premium to the underlying market, they can short the fund, buy the underlying market, and hold the position till the premium eventually dissipates. What is important here is that the investment managers have the liquidity to hold till the arbitrage closes.

This discussion should suggest that alpha is quite hard to generate since most ways of doing so depend on the investment manager possessing unique abilities – to pick stock, identify weaknesses in management and remedy them, or undertake financial innovation. Unique ability is rare. How then do the masses of investment managers justify the faith reposed in them by masses of ordinary investors? The answer is probably liquidity provision, which is the activity that depends least on special managerial ability and could be termed the poor manager's source of alpha. But when the supply of liquidity is plentiful, many investment managers enter the business of liquidity provision. Even as they take ever more illiquid positions, they compete away the returns from doing so. The point is that extremely accommodative monetary policy, as well as a sense that policy will stay accommodative, engenders "illiquidity seeking" behavior, which has close parallels to risk seeking I spoke about earlier.

When Alpha is Hard to Generate

Alpha is hard to generate, but ordinary investors seem to value managers who seem to have the ability to generate it. New investors are attracted by the high

excess returns generated by a manager, and the promise (invariably disappointed, I should note) that it holds for future excess returns. And current investors, if dissatisfied, do take their money elsewhere although they often suffer from inertia in doing so. As an example from one class of investment managers, if you plot the flows into an average U.S. mutual fund as a function of the excess returns it generates, you will see, positive excess returns generate substantial inflows while negative returns generate much milder outflows. Investors thus think that managers who perform well this period will do so in the future. Since managerial compensation also varies with assets under management, overall, investment managers face a compensation structure that moves up very strongly with good performance or apparent alpha, and falls, albeit more mildly, with poor performance. In the jargon of economists, the compensation structure is convex in alpha.

So what is the manager with relatively limited ability to do when central banks flood the market with liquidity and the competition to generate alpha from liquidity provision makes it ever harder to generate more alpha? Put another way, as market inefficiencies are narrowed by the flood of money, what can managers do to earn their keep? As Grossman and Stiglitz have argued, the paradox of efficient markets is that they do not pay those who keep them efficient. Indeed, as I will argue, even while micro-inefficiencies are arbitraged away, the market may develop macro-inefficiencies – large movements of asset prices away from fundamentals – that are really hard to arbitrage away, as a result of agency problems.

What kind of behavior may be engendered when liquidity reduces most micro-inefficiencies? One option is to hide risk – that is, pass off returns generated through taking on beta risk as alpha by hiding the extent of beta risk. Since additional risks will generally imply higher returns, managers may take risks that are typically not in their comparison benchmark (and hidden from investors) so as to generate the higher returns to distinguish themselves.

For example, a number of insurance companies and pension funds have entered the credit derivative market to sell guarantees against a company defaulting. Essentially, these investment managers collect premia in ordinary times from people buying the guarantees. With very small probability, however, the company will default, forcing the guarantor to pay out a large amount. The investment managers are thus selling disaster insurance or, equivalently, taking on "peso" or "tail" risks, which produce a positive return most of the time as compensation for a rare very negative return.[2] These strategies have the appearance of producing very high al-

[2] Peso risk is named after the strategy of investing in Mexican pesos while shorting the U.S. dollar. This produces a steady return amounting to the interest differential between the two countries, although shadowed by the constant catastrophic risk of a devaluation. Another example of a strategy producing such a pattern of returns is to short deep out-of-the money S&P 500 put options [see Chan, Getmansky, Haas, and Lo (2005)].

phas (high returns for low risk), so managers have an incentive to load up on them, especially when times are good and disaster looks remote.[3] Every once in a while, however, they will blow up. Since true performance can only be estimated over a long period, far exceeding the horizon set by the average manager's incentives, managers will take these risks if they can.

One example of this behavior was observed in 1994, when a number of money market mutual funds in the United States came close to "breaking the buck" (going below a net asset value of $1 per share, which is virtually unthinkable for an ostensibly riskless fund). Some money market funds had to be bailed out by their parent companies. The reason they came so close to disaster was because they had been employing risky derivatives strategies in order to goose up returns, and these strategies came unstuck in the tail event caused by the Federal Reserve raising interest rates quickly.

While managers may load up on hidden "tail risk" to look as if they are generating alpha, they are also likely to recognize that true alpha is hard to generate. Therefore, for the more observable investments or strategies for their portfolio, they are likely to be wary of being too different from their peers, because they insure themselves against relative underperformance (that is, generating a negative alpha) when they herd – after all, there is safety in numbers for who can be fired when everybody underperforms? In other words, even if they suspect financial assets are overvalued, they know their likely underperformance will be excused if everyone else is in the same boat.

Both the phenomenon of taking on tail risk and that of herding can reinforce each other during an asset price boom, when investment managers are willing to bear the low probability "tail" risk that asset prices will revert to fundamentals abruptly, and the knowledge that many of their peers are herding on this risk gives them comfort that they will not under perform significantly if boom turns to bust.

Monetary Policy and Incentives

Thus far, I have highlighted four types of behavior – risk shifting, illiquidity seeking, tail risk seeking, and herding among investment managers. My conjecture, which needs to be tested econometrically, is that all these behaviors are amplified when interest rates are low (especially following a period of high rates),

[3] Certainly, the pattern of returns of hedge funds following fixed income arbitrage strategies suggested they were selling disaster insurance. The worst average monthly return between 1990 and 1997 was a loss of 2.58 percent, but losses were 6.45 percent in September 1998 and 6.09 percent in October 1998.

liquidity supply is plentiful, and both conditions are expected to prevail for some time. In reduced form, this behavior will look like an increase in risk tolerance. Conversely, if monetary conditions are expected to tighten substantially, we should see a reversal in this behavior, which would be attributed to increased risk aversion. Of course, part of this behavior would be accentuated by the genuine uncertainty surrounding any turn in monetary policy. Preliminary analysis suggests simple proxies for the risk aversion of financial markets in the United States, such as the VIX index, do seem to be positively correlated with the level of short-term interest rates, as with broad measures for liquidity.[4] Moreover, the VIX explains a significant portion of the variation in emerging market debt spreads [see Kashiwase and Kodres (forthcoming)].

If verified empirically, however, this would suggest an additional "behavioral" channel for the transmission of monetary policy than the ones we are familiar with, the traditional money channel, the borrower balance sheet channel (Bernanke and Gertler (1995)), the bank lending channel (see, for example, Bernanke and Blinder (1988, 1992) or Kashyap and Stein (1997)), and the liquidity channel (Diamond and Rajan (2006)). I admit though that clever work would be needed to tell its effects apart from these other channels.

Nevertheless, from a policy perspective, this "behavioral" channel introduces new dimensions to thinking about monetary policy. For one, it could work entirely through institutions outside the banking system – through finance companies, insurance companies, pension funds, hedge funds, and venture capitalists. Equally important, it could have wider effects than through credit. In particular, it will affect asset prices, and could thus also amplify existing channels like the balance sheet channel, with the riskiest and most illiquid financial assets or borrowers affected the most. Finally, because emerging markets and developing countries offer risky and illiquid assets, there will be substantial spillover of industrial country policies to these markets.

Let me conclude. If indeed there is a strong behavioral channel we need to think more about the following questions:

1 Do the anticipated dynamics of monetary policy matter? For instance, a period of prolonged low rates following a period of high rates may create particularly perverse incentives. On the other hand, rapid and sudden tightening following a prolonged period of accommodation may leave a number of participants stranded on a limb of illiquidity. How should this knowledge affect the conduct of policy and the molding of expectations?[5]

[4] A GARCH model with ARMA terms in the mean equation (thereby correcting for auto-correlation and heteroskedasticity) finds a positive and statistically significant correlation between the first differenced 3-month U.S. T-Bill yield and the implied volatility of the CBOE S&P 500 Index options contract.

2 Should industrial country policymakers take into account the substantial spillovers their policies may have on emerging markets and developing countries? What should emerging market policymakers do when faced with potentially volatile funds that are being "pushed" in because of investor risk tolerance?
3 Should the net for prudential supervision be expanded? What elements need to be brought to bear, if any, to curb immoderate behavior? Do we have tools to affect managerial incentives more directly? What do we have to learn to be able to use them effectively?
4 What happens if there is a crisis? Should liquidity be infused? How? And how does one limit future moral hazard stemming from the infusion?

None of what I have said should be taken as a condemnation of the financial sector, which has contributed immensely to economic growth. But we also do need to work to answer the questions I have raised. It may well be that monetary policy is best focused on maintaining domestic price stability narrowly defined over a medium term horizon, and not on anything else. It is important that we take into account the many changes that have affected the financial world in arriving at this conclusion and not simply leave it to theology.

Thank you.

[5] In many ways, my argument dovetails well with work at the BIS, which suggests that quiescent goods price inflation may have created a fertile new environment for asset price booms and consequent busts. Perhaps oversimplifying the well-argued ideas of Borio (2003), Borio and Lowe (2002), and Crockett (2003), in this new environment, credit expansions are less likely to be accompanied by goods price inflation. Monetary policy that is focused on controlling short-run goods price inflation is likely to exert fewer checks on credit expansion and asset price inflation. The increase in the number of booms and busts in recent years is thus attributed, in part, to the death of inflation. My own view is that the change in the institutions dominating the financial landscape, as well as their incentives, should also be part of the story.

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Activism and alertness in monetary policy

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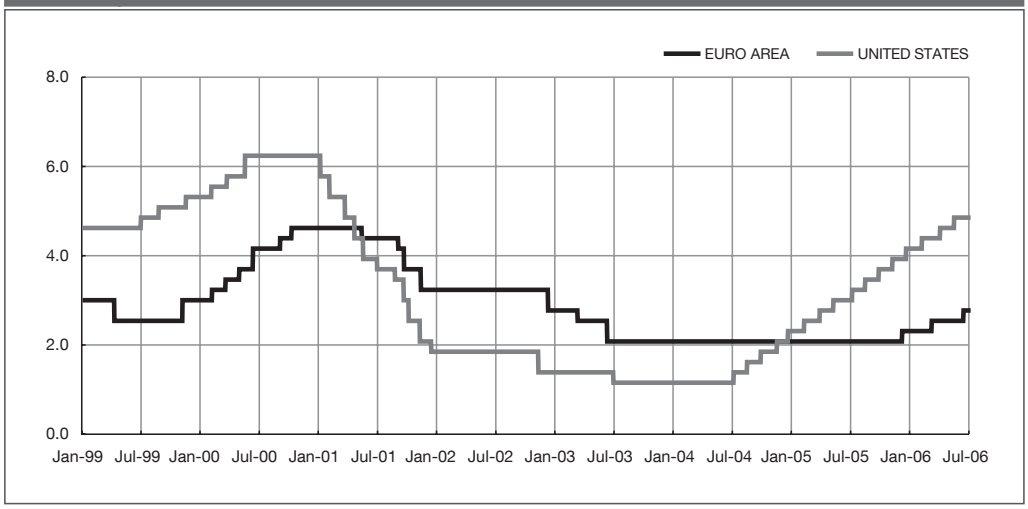
Since 1 January 1999, the day on which it officially became the monetary authority of the euro area, the ECB has changed its policy rate, the rate on its main refinancing operations, 18 times. Over the same period, the Federal Reserve System has made 35 changes. The easing cycle that started on both sides of the Atlantic – and of the Channel – in 2001 saw a cumulative reduction in the policy rate of 275 basis points in the euro area, accomplished in a sequence of seven moves. The ECB started to reverse that cycle in December last year and has since changed its policy in a sequence of three steps. In the United States, the same easing phase saw 13 reductions, with a total loosening of 550 basis points, and was first reversed in June 2004. Since then, the Federal Reserve has hiked its target rate 16 times in continuous steps.

I thought I would take advantage of the opportunity afforded by this impressive programme to revisit a theme on which I have reflected in the past: "activism" in monetary policy. Is there a univocal definition of this notion? Can "activism" be quantified by simple statistics such as the frequency and size of policy moves? Can a central bank be "active" while moving its policy rate in a measured and observationally cautious way? Was the ECB active enough in responding to the evolving state of the euro area economy? The few facts that I have recounted seem to suggest otherwise. I will try to convince you that the contrary is true.

I will offer some provisional answers on the basis of what I believe I have learned thus far. I suspect, though, that the passing of time and further analysis of the euro area economy will be needed to deepen our understanding of this issue.

My definition of activism in monetary policy is, I believe, conventional: activism is the strategic attitude of a central bank that is constantly endeavouring to be faithful to its objective. In the case of the ECB, it is the constant striving to keep inflation close to its arithmetic objective, and to take all the steps needed to check nascent inflationary pressures while at the same time trying to minimise unnecessary

FIGURE 1 **TRANSATLANTIC ASYMMETRY: POLICY RATES SINCE 1999**
(PERCENTAGE POINTS; DAILY DATA)



SOURCES: ECB and FED.
Note: Last observation refers to 8 June 2006. For the euro area the policy rate refers to the rate on the main refinancing operations until 28 June 2000 and to the minimum bid rate thereafter. For the US the federal funds rate is shown.

macroeconomic disruptions in the process. "Activist" is an attribute that applies to a strategy, not to a policy path.

My answer to the question of whether or not activism can be measured by simple statistics is negative. Strategic activism in monetary policy cannot be quantified in simple terms, not in abstraction from knowledge of the key structural forces and economic relationships that govern the functioning of our systems at any point in time. When evaluating the appropriateness of their action, central banks do not have the luxury of linking policy to a handful of summary statistics. They engage in a complicated process of signal extraction from a wealth of diffuse data and events. They calibrate decisions to the key structural parameters of the economy in which monetary policy has to function, to the nature of the shocks to which the economy is typically prone. The path of policy is adjusted accordingly.

The ECB's strategy is as active as it needs to be to fulfil our mandate. I would claim that clarity about the objective of our policy afforded considerable latitude for action in the early years of the decade, and a remarkable leverage over market conditions more recently. This has happened despite repeated unfavourable shocks in the former period and apparent policy inaction in the latter. Always, our strategy and the information coming from the real economy, as well as from the sphere of monetary aggregates, much more than our words, have shaped market expectations beyond the very near term, a sign that the complex analysis required to pre-

dict our judgement has not materially impeded market participants in responding meaningfully to incoming data.

Policy activism and economic dynamism

To frame the issue, let us consider a stereotypical monetary policy reaction function that has a short-term interest rate on the left and a number of observable reaction variables on the right. Think, for example, of any kind of reaction functions that econometricians and expert observers often use – and sometimes abuse – to compare monetary policy strategies. In essence, they all encapsulate a simple rule of thumb: raise the policy rate if anticipated inflation is higher than the objective and there are signs that the economy is operating above capacity. An additional condition for ensuring macroeconomic stability that applies to these rules is that the reaction in the nominal rate must be strong enough for the *real* rate to be varied pro-cyclically: when inflation expectations rise, and the economy expands above potential, *real* monetary conditions have to be tightened.

I choose this way of framing the issue primarily because it is widely used by our observers, and because it is sufficiently concise to be easily understood. But, before launching into the analysis, I should add that, precisely because it is simple and pedagogical, this framework is also a very incomplete description of our policy behaviour. Overall, because it does not capture the very essence of the two-pillar strategy, based on an economic assessment of medium-term risks to price stability, on the one hand, and a cross-checking based on medium to longer-term risks assessed though our monetary analysis, on the other. Also, because such representations of our policy are not sufficiently state-contingent, whereas my colleagues and I are far from being exclusively guided by mechanical configurations of indicators, but are very interested in the contingencies, and finally take our decisions on the basis of synthetic judgement enlightened by multiple experiences. As I often say, collegial wisdom is of the essence in central banking. This underscores the tension between *describing* policy simply and *implementing* policy simply: simple descriptions of policy need not – and indeed never do – mean simple policy behaviour.

Assuming that the parameters attached to the various indicator variables in the reaction function indeed capture the deep strategic preferences of the central bank, empirical estimates of these coefficients are often used to quantify the strength with which the central bank intends to respond to the state of the economy. In other words, these estimated parameters are sometimes viewed as objective measures of strategic "activism" in monetary policy.

A central bank would qualify as *strategically more passive* – or less active – than another central bank if the estimated coefficient attached to inflation expectations in deviation from the central bank's objective, and the estimated coefficient

penalising the indicator of macroeconomic slack, turned out to be smaller. Why would this central bank qualify as more "passive"? Because, for given variances of inflation and real activity, this central bank would indeed be inclined to take more moderate action in response to changes in the outlook. It would move its policy rate by narrower margins – and perhaps more infrequently – than its more "activist" counterpart. Moreover, as analysts typically append a partial adjustment mechanism to the representation of how the central bank interest rate responds to the economic state, there is an additional source of "activism" – or "passivity" – that would emerge from these simple empirics. This is the inertia coefficient attached to the lagged interest rate dependent variable, which in these rules moderates the pace of reaction of the policy rate to its fundamental determinants.

In any case, in the naive theory of this world, plain comparison of the frequencies of policy moves and the size of interest rate adjustments would suffice to tell the strategies of these two central banks apart. A smoother policy path would signal a "more passive" strategy.

But of course the world is not that simple, and in fact there are serious pitfalls lurking behind strategic inferences drawn on the basis of comparisons of variances in policy rates. It is not too difficult to portray situations in which such inferences could be highly misleading. I will give three examples, all relaxing one important qualification upon which my earlier example was predicated: the assumption that our two central banks are confronted with the same economic environment.

First, imagine two central banks which are equally responsive to economic conditions: in the reaction-rule jargon that I am using here, these are two central banks that share exactly the same reaction parameters. But one central bank now faces a less dynamic economy than its counterpart. By "less dynamic" I mean an economy that – as a matter of regularity – is hit by shocks of smaller magnitude which tend to fade away more gradually. Here, *reaction parameters* are the same – by hypothesis – but the *reaction variables* fluctuate at different speeds. All other things being equal, the patterns of adjustment of the policy rate that the same rule would induce in the two economies would be likely to look very different. The central bank operating in the less dynamic economy would in all likelihood be observed to adjust interest rates along a more moderate path. The other central bank would appear more reactive. But any strategic implications drawn from the variance in the two policy paths would be purely illusionary. The smoother course of policy would not reveal any deep-seated strategic inertia: it would only reflect the same response to shocks with quite different dynamic properties. Monetary policy would appear "passive" because the economy itself was evolving slowly.[1]

[1] A similar interpretation of "interest rate inertia" – the tendency of central banks to adjust rates in the same direction and in small steps – can be found in G. Rudebusch, "Term structure evidence on interest rate smoothing and monetary policy inertia", *Journal of Monetary Economics,* Vol. 49 (pp. 1161-1187), 2002.

A second example again considers two identical central banks, now facing shocks of a different nature. One central bank predominantly faces demand shocks, which result in persistent departures from trend growth. This statistical pattern has symmetric and durable effects on output and inflation and thus presents a relatively straightforward monetary policy problem under the rule that I am postulating here for simplicity. As both reaction variables – forecasted inflation and output – would frequently move in tandem, the policy rate of this central bank would have to be changed frequently and forcefully in the same direction to offset the shock. But what would happen in the other economy, if it – unlike the first – were more prone to supply shocks? Experience suggests that supply shocks yield sharp transitory increases in inflation, possibly followed by smaller, more permanent "second-round" effects, though the longer-run impact on inflation is obviously significantly determined by the response of monetary policy. Given the transitory nature of the initial inflation bursts, the simple hypothetical rule – which incorporates the reaction to *expected* inflation – would advise the central bank to "look through" the immediate isturbance and change policy only to the extent needed to offset the anticipated more permanent effects of the shock on inflation in subsequent quarters. Its policy rate, again, would be observed to be less variable. What is important to note is that the same rule – equally active strategies – would support two different patterns of observed policy behaviour in different economic environments.

The third case is perhaps the most interesting of all. Here exogenous shocks are identical, but economic structures differ. Different transmission mechanisms therefore propagate the same shocks with lags that vary between the two economies. The first economy has more rigid adjustment mechanisms: pricesetters and wage-negotiators are more sluggish than those in the other economy in processing economic news – including changes in the stance of monetary policy – and bringing them to bear on their decisions. What is the source of those rigidities in the first economy? There can be many reasons for rigidity. Perhaps labour practices and contractual institutions – dating from the early post-war decades when the economy was heavily regulated – induce distortions in large segments of the labour market. This stands in the way of an efficient matching of skills and productive capabilities. Perhaps tight regulatory restraint on business and statutory inhibitions discourage innovation and impede a faster response to new shocks and new opportunities. Whatever the source of rigidity, the observational result is that prices and wages in the first economy reflect changes in fundamentals with considerable lags.

How should monetary policy respond to shocks in these conditions? Note that I am moving away from the naive world of simple policy rules and am taking a step further into the – admittedly no less conjectural – realm of optimal policy design. The answer to my question depends critically on the inflation process that we postulate. We know that when inflation expectations are well-anchored

around the inflation objective of the central bank, the evolution of inflation over time is influenced by the numerical objective of policy more than by the history of inflation itself. We can state this differently, saying that when the economy internalises the central bank's objective firmly, the inflation process becomes less persistent and more forward-looking. If inflation expectations are well-anchored, a shock to inflation in the recent past is likely to have a lesser impact on inflation in the future. One reason for this is that the shock will not encourage workers to bargain for commensurate rises in nominal wages to protect the real value of earnings. Equally, firms would certainly resist such potential bargaining. All such parties and other price-setters will anticipate that the central bank will ultimately drive inflation back to its pre-shock level. Hence, they will tend to treat past inflationary shocks as transitory and inconsequential for the future outlook.

In the first economy in this example, where prices are sticky and inflation expectations are well-anchored, monetary policy can be more patient and focused on the medium term when confronting a cost-push shock. Again, as in the other two examples, it is likely to be observed to change policy less aggressively in the face of an unexpected shock to headline inflation. But this seeming "patience", once again, does not signal inertia, "passivity" or neglect for macroeconomic conditions. It reflects a careful calibration of the policy course to the structural peculiarities of the underlying economy. First and foremost, the policy response to the inflationary shock will be less persistent because the inflationary consequences of the shock will be more promptly reabsorbed in the first place. Second, with stickier prices, a change in the nominal policy rate of a given size will have a stronger impact on the *real* rate, which is all that matters when it comes to measuring the stance of policy. In these conditions, a more moderate policy path is not a cause of instability. In fact, it is the very precondition for avoiding the dangers of over-steering, of accidentally destabilising the economy.

Of course, the thought experiments that I have been sharing with you so far are only as useful as the rules or the optimality benchmarks with which real-world behaviour has been compared. And I am certainly not the only one here who believes that simple reaction rules – or monetary policy optimality exercises, for that matter – cannot serve as the ultimate test for actual policy behaviour. But I hope I have conveyed one notion. Even in the over-simplified world of my canonical examples, where the macroeconomic state can be adequately described by a handful of facts, where these facts are reliably condensed in summary indicators – which, too, are immune from sampling errors and statistical revisions[2] – and where policy

[2] Of course, in the actual practice of monetary policy, uncertainty about the data is extremely pervasive. We are even uncertain about the current economic situation as economic data are received with a lag, are typically subject to multiple revisions, and in any case can only roughly and partially depict the underlying economic reality.

algorithms are an acceptable description of policy choices, even in that conjectural world the variability of the policy instrument would not be a sufficient statistic with which to judge monetary policy strategies.

In particular, even in that world, a slower-moving, structurally more rigid economy would support an observationally more moderate policy course.

In the real world, as I will try to explain next, that observationally moderate path for policy receives an even stronger justification.

Facts and policy in the euro area

My emphasis on a structurally more rigid and less dynamic economy periodically facing adverse supply shocks is, of course, deliberate. That laboratory case resembles the euro area that I know. I will organise my interpretation of stylised facts about the euro area in the recent past into three broad categories: shocks, structures and monetary policy.

Shocks

One reason the euro area resembles my third example is that, compared with the United States, it seems to be subject to demand shocks of smaller magnitude but to be more frequently hit by supply shocks.[3] In the last ten years this shock pattern seems to have grown even more pronounced, despite globalisation and a generalised shift towards closer international economic integration.[4] This is nowhere more evident than in the anatomy of the boom-bust cycle that spanned the decade starting in 1995 in the two economies. In the United States, the run-up phase was significantly propelled – as we know with hindsight – by overly optimistic views about long-run earnings growth and, notably, exaggerated beliefs in the profitability of emerging technologies. But the strength in business investment that the boom brought with it also had important implications for the supply side of the US economy, through its influence on the rate of increase in labour productivity and thus the economy's sustainable level of potential output. ECB staff calculations estimate that the contribution to the growth of output per hour worked coming from capital deepening doubled in the United States in the course of the 1990s. Subsequently – and despite the sharp reappraisal of

[3] See, for example, the structural comparative analysis in F. Smets and R. Wouters, "Comparing shocks and frictions in US and euro area business cycles: a Bayesian DSGE approach", *Journal of Applied Econometrics,* 20(1), January 2005.

[4] This is a well-known, if certainly surprising, fact. See, for example, J. Stock and M. Watson, "Has the business cycle changed? Evidence and explanations", paper presented at the Federal Reserve Bank of Kansas City Symposium "Monetary Policy and Uncertainty," Jackson Hole, Wyoming, August 28-30 2003.

those expectations and the unprecedented drop in business investment that followed the market collapse in 2000 – it stabilised at the elevated levels that it had reached at the turn of the millennium. Since then, remarkably, capital deepening has been replaced, as the main engine of output per hour growth, by extraordinary advancements in total factor productivity (TFP). Arguably, US firms have been able to meet expanding demand with a more efficient organisation of the production processes.

The same ten-year episode had a distinctly different face in the euro area. The stock market appreciation – comparable in size to that seen in the United States – went hand in hand with a *decline,* not a rise, in the contribution of capital to measured productivity. And a contemporaneous steady decline in TFP throughout the decade has *reinforced,* rather than offset, the diminishing contribution of capital.[5] The euro area seems to have had its fair share of stock market turbulence, without enjoying the side benefit of improved supply conditions.

The slowdown in trend productivity has been a primary determinant of the weak economic performance of the euro area. By depressing income growth prospects and by reducing the prospective return on capital, it has held back consumption spending and business investment, which has been further curtailed to some extent by the ongoing demographic shift towards a more elderly population.[6] Rapidly decelerating productivity was one force behind the counter-cyclical rebound in unit labour costs that we observed during the early part of the new millennium. (See figure 2)

This surge in unit labour costs was atypical, if contrasted with the way in which unit labour costs in the United States elastically responded to the downturn with a sharp decline, and it represented an ongoing source of inflationary pressures. Adverse underlying developments in productivity have made it more difficult for our firms to smooth through the volatility of the many non-wage

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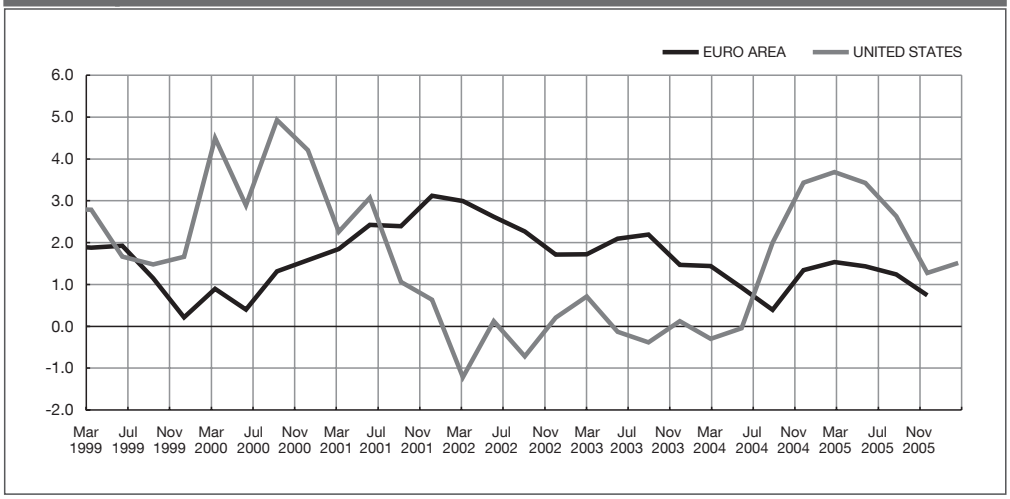
[5] See G. Gomez-Salvador, A. Musso, M. Stocker and J. Turunen, "Labour productivity developments in the euro area", forthcoming as an ECB Occasional Paper. They report that the average contribution of capital to measured productivity growth in the United States was 0.6 percentage point in the first half of the 1990s, increasing to 1.1 percentage points in the second half of the decade and stabilising at 1.0 percentage point on average between 2000 and 2004. In the euro area, the trend was reversed: a contribution of 1 percentage point in the first half of the 1990s became 0.4 percentage point and 0.6 percentage point, respectively, in the second half of the 1990s and in the first five years of this century. The TFP contribution, calculated on the basis of the Solow residual, tripled in the United States from the early 1990s to 1.6 percent on average in 2000-2004, but halved in the euro area from 1.3 to 0.6 percent in the same period. Correcting the euro area TFP measures mentioned above for variable capital utilisation does not change the picture. In fact, such correction would shift the start of the slowdown in productivity to the mid-1990s.

[6] As the share of the population that is of working age declines, the rise in the capital stock needed to equip the labour force decreases. Lower rates of investment in some member countries may also reflect some relocation of production to China and other newly industrialised countries (where investment rates have been quite high in recent years).

FIGURE 2 **ANNUAL CHANGES IN UNIT LABOUR COSTS IN THE EURO AREA AND THE US**
(PERCENTAGE POINTS; QUARTERLY DATA; SEASONALLY ADJUSTED)



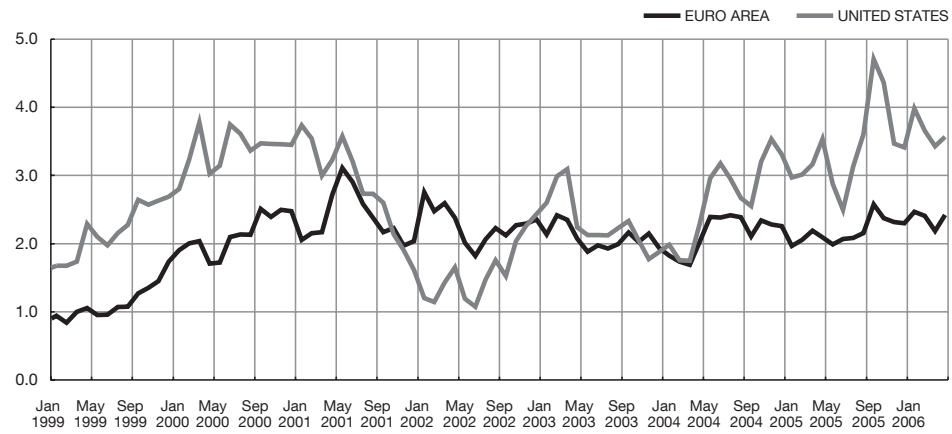
SOURCES: Eurostat and BIS.
Note: Last observation refers to December 2005 for the euro area and March 2006 for the US.

cost disturbances that they have encountered since 1999. This lesser degree of resilience has kept the evolution of inflation – and real activity as well – constantly vulnerable to unexpected shocks, such as the increases in the prices of energy and beef – to name only two – which have been brought about by adverse changes in supply conditions.[7] Note that inflation (see figure 3) edged higher in the downturn phase and remained at elevated levels thereafter, at a time when the accumulating margin of slack in labour and product markets could in fact have been expected to reduce price pressures. Again, compare these developments with the sharp disinflation which occurred, during the same period, in the United States.

Of course, we cannot directly observe full capacity of either labour or other production factors. Consequently, we can never be certain about the level of activity that would represent the full utilisation of available resources, and even less so about the strength of the relationship that links utilisation and inflation. However, I hope that I have demonstrated that this connection is seemingly weak in the euro area, probably weaker than across the Atlantic.

[7] The cluster of large unanticipated supply shocks that have implications for the Harmonised Index of Consumer Prices that is the focus of the ECB's inflation analysis includes a strong and persistent increase in the price of oil and natural gas in 2000 and again after 2004; increases in unprocessed food prices associated with the outbreak of BSE and foot-and-mouth disease in 2001; and rises in administered prices and tobacco taxes announced in late 2004.

FIGURE 3 **CONSUMER PRICE INFLATION IN THE EURO AREA AND THE US**
(YEAR-ON-YEAR PERCENTAGE CHANGE; MONTHLY DATA; SEASONALLY ADJUSTED)



SOURCES: Eurostat and BIS.
Note: Last observation refers to April 2006.

Structures

This structural feature brings me to the second category of my remarks: the structure of the economy on this side of the Atlantic. I will concentrate on two factors that critically affect the relationship between inflation and the fundamental shocks that drive the economy and determine its state: price flexibility and the anchoring of price-setting.

Extensive empirical research on price flexibility and inflation persistence in the euro area has recently been produced in a concerted effort that has occupied staff of the ECB and of the entire European System of Central Banks.[8] It comes to two main conclusions. First, in the euro area, prices are distinctly less flexible than, say, in the United States. Prices change infrequently: the average duration of a consumer price spell – a measure of the time that it takes for retailers to reprice

[8] See E. Dhyne, L. Alvarez, H. Le Bihan, G. Veronese, D. Dias, J. Hoffmann, N. Jonker, P. Lünnemann, F. Rumler and J. Vilmunen, "Price-setting in the euro area: some stylised facts from individual consumer price data", ECB Working Paper No 524, 2005. The paper reports that the average duration of CPI price spells in the euro area is 4.3 quarters. By comparison, M. Bils and P. Klenow, in "Some evidence on the importance of sticky prices", *Journal of Political Economy* 112, 2005, calculate that the average duration of CPI prices in the United States is 2.2 quarters. Other Phillips curve-based analyses broadly confirm these results. For the euro area, see J. Gali, M. Gertler and D. Lopez-Salido, "European inflation dynamics", *European Economic Review* 45(7), 2001, and J. Gali, M. Gertler and D. Lopez-Salido, "Erratum", *European Economic Review* 47(4), 2003.

TABLE 1 **MEASURES OF PRICE STICKINESS FOR THE EURO AREA AND THE US**

	STATISTICS	EURO AREA	US
CPI	Frequency	15.1	24.8
	Average duration *(months)*	13.0	6.7
	Median duration *(months)*	10.6	4.6
PPI	Frequency	20.0	n.a.
Surveys	Frequency	15.9	20.8
	Average duration *(months)*	10.8	8.3
New Keynesian Phillips Curve	Average duration *(months)*	13.5 - 19.2	7.2 - 8.4

SOURCES: For the CPI in the euro area, Dhyne *et al.* (2005), Bils and Klenow (2004) in the US. For the PPI, Vermeulen *et al.* (2005). Surveys: Fabiani *et al.* (2005) for the euro area, Blinder *et al.* (1998) for the US. New Keynesian Phillips Curve: Estimates in Galí *et al.* (2001, 2003) refer to the GDP deflator and are converted from original quarterly figures.

their products – is 13 months (see table 1). According to surveys, it is 11 months for producers. In the United States, comparable figures indicate durations of less than 7 months and slightly more than 8 months respectively.[9]

More infrequent price revisions make the setting of prices less responsive to economic news, including, as I already pointed out, changes in monetary conditions. In general, sticky price revision processes reduce the odds that the imbalances created by economic shocks can be rectified by adjustments in prices. Conversely, they make the burden of adjustment to a shock fall disproportionately on changes in output, incomes and employment. Also, stickier prices tend – all other things being equal – to increase the persistence of inflation. This is because the impact of a shock that today modifies firms' real cost conditions tends to be spread out over an extended future, as staggered price adjustments catch up only slowly with the changed underlying circumstances.

Despite sluggish price-setting mechanisms, however, inflation persistence in the euro area is low by international standards. This is the second important finding of the new body of evidence that I mentioned: an inflationary shock dissi-

[9] Abstracting from methodological differences in price-collecting procedures across statistical institutes, differences in the frequency of price adjustments can be due to various causes. Differences in the degree of competition, especially in the services sector, may be a factor, particularly given evidence that the divergence of such frequencies is most pronounced in that sector. Another factor that is often cited is the fact that small corner shops, which change their prices less frequently than supermarkets, have a higher market share in euro area countries than in the United States.

pates quickly in the euro area despite rigidities, and inflation has a tendency to return to its long-run norm reasonably quickly. The half-life of the effect of a shock to inflation is considerably less than one year, which is close to the figure that one obtains, for example, for the United States, again notwithstanding vastly different patterns of price-updating practices across the two areas.

What explains this apparently inconsistent evidence? Another ECB study, estimating a structural model on euro area and US data, goes some way towards reconciling empirical stickiness in prices and low persistence in inflation on the basis of a model of inflation determination that features real costs and *expectations.*[10] As I said before, even if price sluggishness introduces persistence into the inflation process – which in itself tends to perpetuate past inflation pressures into the future – some of that persistence can be undone if the expectations of price and wage-setters are focused on the objective of the central bank. Indeed, this study finds that the influence of the ECB's inflation objective on the evolution over time of inflation outweighs the influence of past shocks, and thus at least partly compensates for the added inertia resulting from a more rigid economic structure. We are pleased to observe that analysis of survey-based measures of inflation expectations suggests that central bank leverage on expectations has become much stronger since the establishment of the euro.[11]

Monetary policy

Having reviewed structures and shocks, I now move on to the third aspect of my discussion of the euro area: monetary policy. Did considerations pertaining to the nature of the shocks that occurred in the recent past and to the structural peculiarities of the euro area play any role in positioning the stance of monetary policy? Can they go some way towards explaining the observationally moderate path that the policy rate has followed in the euro area? Did the smoother path of our policy rate impede a smooth adjustment of the euro area to the shocks that have hit the global economy in the recent past? Finally, does low inflation persistence provide reason for complacency?

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[10] See L. Christiano, R. Motto and M. Rostagno, "Financial factors in business cycles", presented at the IMF-IRF Conference on *DSGE Modelling at Policymaking Institutions: Progress and Prospects* hosted by the Federal Reserve Board of Governors (Washington, 2-3 December 2005).

[11] The consumer survey on inflation expectations compiled by the European Commission is a good barometer of the sensitivity of short-term inflation expectations to recent inflation dynamics. Results are presented in terms of the difference between the percentage of respondents who believe prices will increase and the percentage of respondents who believe that they will decrease or stabilise. Prior to the euro cash changeover there was a tight relationship between this qualitative indicator and actual inflation developments, with a correlation coefficient close to 1. However, since the cash changeover, the correlation between the two series has dropped to 0.4.

When the ECB in early 2001 initiated the easing cycle that we started to reverse in December last year, this was done on the heels of significant adverse supply shocks, relatively strong wage dynamics, and headline inflation rates at levels unseen in Europe since the late phases of convergence to the new currency. Yet the Governing Council judged that our commitment to attaining price stability, in line with our official definition, through our monetary policy strategy was sufficiently credible for us to take that easing decision without running the risk of destabilising inflation expectations. That conviction was reinforced by a rapidly deteriorating outlook and by reassuring signs that inflation expectations discounted a scenario in which inflation would settle in the zone of price stability in the medium term. The rapid softening of activity that we saw coming and the increasing odds that the recovery would not materialise soon – we believed – would validate ex post the inflation expectations and make the threat of renewed inflation considerably weaker. Information extracted from monetary trends supported our prediction of subdued inflation looking into the more distant future.

Monetary accommodation was quicker and, in retrospect, far more persistent than could have been predicted on the basis of the policy regularities on record. In the end, monetary action amounted to an interest rate reduction of 275 basis points, bringing the policy rate to a level which was below the lowest intervention rate of the central banks of an overwhelming majority of member countries, including Germany, during the last 50 years. It is all the more remarkable that we were able to follow such a historically unseen trajectory for our vast continental economy, the euro area, given that the individual countries had very diverse and mixed legacies as regards past monetary credibility.

It is difficult to work out a convincing counterfactual: what would have happened if the reaction of the ECB had been more in line with the patterns of policy behaviour established in the past, rather than the more forceful action we took. However, structural – if model-specific – analysis of the mix of the macroeconomic shocks that have hit the euro area since 2001 reveals with hindsight that the extra monetary policy stimulus that we introduced has been critical in avoiding a deeper and more enduring recession here and on a global scale.

I judge that the policy course was carefully calibrated to the structural characteristics of the euro area transmission mechanism, some features of which I tried to outline earlier. We were guided, in particular, by the understanding that a central bank operating in a relatively rigid economy is able to deliver the same quantum of monetary accommodation by adjusting its policy instrument in more moderate steps than in a relatively more flexible economy. Under the structural conditions that prevail in our economy, a more aggressive easing would have introduced unwelcome volatility in both inflation and output that would have necessitated corrective, countervailing action further

down the road.[12] Certainly, as I will argue shortly, the ECB would not have maintained the nominal and real policy rate at the low levels at which they were held for more than two years without consistent signs that expectations were well-anchored and inflationary shocks were being quickly reabsorbed.

Alertness and active communication

No central bank represented in this room, or elsewhere, can reasonably spell out in advance its reaction to every conceivable contingency. This means that surprises in our behaviour can never be ruled out, notably in the face of potent shocks. In particular, we might be confronted with new occurrences of risks which could force us to take bold steps that our observers could not have predicted by extrapolating from our past history of policy conduct. To some extent, this is what occurred over the earlier phase of the international economic downturn: we took sizeable risks in the direction of "activism".

What were those risks? First, in an economy as rigid as the euro area, it might well be true that temporary imbalances between demand and potential supply are slow to show through convincingly to inflation. But if and when they finally do, they would be more costly to correct.[13] So, monetary policy should be sufficiently alert to any threats to the outlook for price stability, so that it does not find itself reacting belatedly – and with less chance of success – to trends that have long been underway.

Second, it is true that the expectation that inflation will not come loose from its anchor affords some short-term flexibility to respond to economic disturbances – with a view to ensuring more balanced macroeconomic conditions in the longer term. But that flexibility only lasts as long as economic agents and the public are confident that the opportunity will not be misused. And we just do not know enough about the way policy actions influence expectations and how sensitive central banks' credibility is to short-run departures from low inflation to warrant ex-

[12] Counterfactual simulations based on a large-scale estimated dynamic general equilibrium model of the euro area have quantified the implications of alternative policy scenarios. This analysis reaches two conclusions. First, the loss in GDP that would have been associated with a situation in which the ECB did not deviate from the estimated reaction rule embedded in the model – and thus monetary policy in the euro area followed a tighter course – would have come close to 1% per annum on average since 2001. Second, had the ECB followed a more aggressive policy easing, one resembling the sharp rate reduction engineered by the Federal Reserve in the United States, the standard deviation of inflation would have tripled and the standard deviation of output doubled since 2001. The model used is documented in Christiano et al cited above.

[13] Another way to state this notion is that in an economy such as the euro area, where prices and wages are as rigid as they prove to be, the "sacrifice ratio" is probably large. This means that the action required to counter inflation – when inflationary pressures actually emerge – would be more forceful.

perimenting. Occasional monetary policy activism, as circumstances require, is not the same as fine-tuning. Fine-tuning – if I may twist a phrase borrowed from Alan Blinder and Ricardo Reis – cannot be resurrected.[14] Building and maintaining a reputation for prudent policy involves commitment to a systematic strategy: that is, following a recurrent pattern of behaviour, so that stable expectations are consistently validated ex post.

During the extended period of policy accommodation, we were able to steer expectations effectively without explicit action, proof that markets accept as true the ultimate motives of policy that we profess. In those instances in which expectations displayed signs of overreaction to current events – such as surging oil prices – our renewed emphasis in communication on our objective, on the vigilance and determination that we would apply to enforce it, on our *steady alertness,* provided effective resistance to inordinate developments. Importantly, signalling vigilance proved instrumental in reaching a common understanding with the markets: the ECB, though observationally inactive, was at any time ready to start action. Our policy course was rightly seen as always contingent on the arrival of new information. Given the information available each time the Governing Council meets, the standing assumption in the markets should always be that the policy decision is aimed at positioning the stance of policy appropriately. No history of past monetary policy decisions could ever be taken as an indication of a commitment, on our side, to enact a sequence of interest rate moves in the future. Unconditional – or "quasi-unconditional" – talk about future policy would have impaired the difficult balance that we maintained between supportive credit conditions and persistently anchored inflation expectations. Active emphasis in communication upon "alertness" required keeping all options open to a – possibly quick – change in policy. Pre-commitment to a policy path would certainly have made that reversal of policy difficult to execute and/or to justify, and therefore non-credible.

The markets seem to have internalised these strategic principles with an increasing degree of precision. Incoming data which, since the autumn of 2005, have indicated more persuasive signs of a recovery in an environment of abundant liquidity and elevated commodity prices were correctly mapped into expectations that the stance then prevailing would not be consistent with controlling inflation over the medium term. Markets anticipated in good time that the ECB would soon begin reversing the extra easing that had been put in place.

In retrospect, market expectations have aligned well with our intentions. Since December, consistent with our remit to be alert and pre-emptive, the monetary

[14] See A. Blinder and R. Reis, "Understanding the Greenspan Standard", paper presented at the Federal Reserve Bank of Kansas City Symposium "The Greenspan Era: Lessons for the Future", Jackson Hole, Wyoming, August 25-27 2005.

policy of the ECB has been perceived to be in a mode of progressive withdrawal of monetary accommodation. Indeed, this withdrawal has been and remains conditional on the evolution of our analysis with respect to our objective of price stability, but it has not been predicated on any single shortterm indicator of the macroeconomic state. In the last few months, the ECB has not measured the state of the economy by the strength or weakness of any particular piece of incoming news. It has continued to extract the macroeconomic trend from the wealth of cumulative evidence accruing – from month to month – from the economic and the monetary side. In both cases, the medium-term orientation of its monitoring activity has been preserved. Two examples: as regards our economic analysis, when looking at the underlying trend of growth of the European economy, we judged in the second half of last year that we were experiencing a recovery with the trend progressively approaching potential. We judged that the short-term volatility observed in important indicators, including the quarterly growth figure for the fourth quarter of 2005, did not call into question the medium-term growth prospects and therefore the associated gradual increase of risks to price stability. Another example can be extracted from our monetary analysis: consistent indications that broad money growth was increasingly due to its most liquid components has contributed in recent months to a gradual tilt of the balance of risks perceived to be signalled by our monetary analysis. It was not the behaviour of aggregate M3 per se which altered the outlook for price stability. It was the realisation that the structural force at work behind persistently abundant liquidity was becoming increasingly connected with final spending and pricing decisions.

As I said at the start, the complexity of the analysis required to predict our moves has not materially impeded market participants in responding meaningfully to incoming data. The understanding of our strategy and the information coming from the real economy, as well as from the sphere of monetary aggregates, have shaped market expectations beyond the very near term. I attribute this satisfactory result to our policy framework, which features a primary, sharplydefined objective and a systematic reaction to events whenever the objective is perceived to be at risk.

Concluding remarks

I am sometimes asked the following question: "You are in the process of increasing rates. Is your judgement that your rates today are significantly lower than they should be? What then is the level of the "neutral rate" that you would judge it appropriate to reach (as rapidly as possible)?"

My response to such questions would be the following. First, we are not in a position that we would judge "abnormal", in the sense that we would have to in-

crease as rapidly as possible our interest rates up to the "normal" level. We are in a process of progressively withdrawing the present degree of monetary accommodation commensurate with the risks to price stability that we perceive, associated in particular with the present development of the economic recovery. To the extent that we never previously pre-committed to unconditional moves and we have always adhered to the posture of steady alertness which is at the heart of our strategy, our monetary policy stance should and does – to the best of our own comprehensive, deep and candid assessment of the situation – *at any time* makes it possible to cope with the risks we see for price stability in a medium-term perspective. Then, in a dynamic perspective, our refusal of unconditional pre-commitments, our position of permanent, *steady alertness* and our strategy help focus our policy upon being permanently at the "correct level" in terms of attaining our primary goal in a medium-term perspective.

Second, from a central bank's perspective, the Wicksellian concept of a "neutral rate" is more particularly useful in the event that the central bank has – for whatever reason – moved its rates far away from the policy stance that it would judge appropriate *ici et maintenant,* here and now. As you can see, in my view, this cannot be the case for the Governing Council of the ECB.

Third, one can be sure that we will continue to analyse the situation very carefully on an ongoing basis. It is clear that if our main scenario is confirmed over time, a further withdrawal of monetary accommodation will be appropriate. We do not specify ex ante a sequence of policy actions, as I have said clearly since last December. The appropriate policy stance will always depend on information on the economic and monetary side and on the source and dynamic properties of the underlying shocks that will hit the economy and we will always remain alert. It is the combination of events and data, some expected, others unexpected, that will be analysed and will permit us to define our future trajectory.

Thank you for your attention.

Payment and Securities Settlement Systems

Drivers for change in payment and securities settlement systems

Gertrude Tumpel-Gugerell
European Central Bank

Introduction

It is both an honour and a pleasure for me to be here and to celebrate with you the 150th anniversary of the adoption of the name "Banco de España" by the Spanish central bank. I am very grateful for the opportunity to comment on issues relating to payment and securities settlement systems, which I regard as vital for the central banking community.

I am also delighted to have three distinguished speakers participating in this session: Mr Giovannini, who will discuss the challenges of integration in the European securities settlement systems, Mr Noyer, who will comment on European payment systems, and Mr Santomero, who will provide us with a US perspective on the changing pattern of payments.

I will introduce this session with some remarks on the drivers of current and future institutional developments in payment and securities settlement systems. Enhancing economic productivity depends to a considerable extent on the efficiency of the payment and securities settlement market. In fact, it has been argued that a significant part of the backlog of productivity growth in Europe vis-à-vis the United States results from inefficiencies in banking and securities settlement. I believe that progress has been made to eliminate these inefficiencies, but more work needs to be done by the financial industry, regulators and politicians to speed up the process.

1 Payments

To meet the challenges in the field of payments, I would like to discuss three areas of action.

1.1 Integration of the large-value and retail payments market

In my discussion of the integration of the payments market, I will focus primarily on Europe. The United States is more advanced in this respect as the integration process has already taken place there.

For large-value payments, the creation of TARGET2 will conclude the consolidation process of RTGS systems in the euro area that was initiated with TARGET1. TARGET2 will provide the potential for further efficiency gains and cost reductions to its users. Additionally, it will incorporate features that allow for more flexibility in the risk-cost trade-off, for example liquidity saving features.

What does this mean in practice? In my view the launch of TARGET2 will create the possibility for pan-European banks to centralise their payments back offices and liquidity management. Economies of scale and scope will lead to sizeable cost reductions.

TARGET2 is not the only driver for integration, consolidation and consequently for potential efficiency gains for banks and society. The creation of the Single Euro Payments Area (SEPA) will boost the development of Europe's single market. For retail payments, the creation of the SEPA is the topic driving the integration of the payments market in the euro area. The Eurosystem has allocated considerable resources to support this process, encourage banks to work towards the SEPA goals and involve all stakeholders. The SEPA project is far-reaching and involves the creation of standardised pan-European payment schemes, such as credit transfer and direct debit. In addition, it includes a framework for the pan-European use of cards. From 1 January 2008, the SEPA will promote choice.

Choice for corporations, merchants and consumers: thanks to the SEPA, corporations, merchants and consumers will no longer be bound to their "national" commercial banks or card schemes. Furthermore, merchants will be able to choose to accept debit card schemes in their shops other than the current national ones.

Choice for the commercial banks: banks can choose to enter new geographical markets by offering their payment services to potential new clients in other European countries. The SEPA also offers banks a choice for processing their payments. Owing to standardisation, infrastructures will become fully interoperable within the SEPA. Consequently, geographical location will no longer be an issue. Moreover, I expect that the number of automated clearing houses in the euro area will fall considerably in the coming years, a prediction which has also been publicly acknowledged by them.

Ultimately, I anticipate that the SEPA will create a competitive pan-European payments market. The SEPA will enable banks and infrastructures to reduce their costs and exploit economies of scale. In the end, the SEPA will allow the end-user to benefit from these efficiency gains through a combination of better products, better services, and better prices. TARGET2 and the SEPA will therefore transform the payments market in the euro area, making it more dynamic and cost efficient.

1.2 Technological innovation will be one of the additional effects of these dynamics

Exploiting technological innovation can be an important means of saving costs, which is a pressing need in the payments business in order to avoid further erosion of profitability. For instance, if customers move away from paper to electronic payments, the consequent use of straight-through processing would become a reality, even for retail payments. Considerable cost savings would become possible. In order to fully exploit the technological possibilities, standardisation is required. If the market cannot agree on standardisation, regulatory steps may be necessary.

1.3 Enlarging the market for payment services

An additional effect of the dynamics in the market for payment services will be the enlarging of the market, e.g. by promoting cashless payments and offering value-added services to customers. This will lead to cost-savings, but will also generate further revenue sources. Although it falls to the banks to develop their business proposals, central banks can assist by offering their expertise.

2 Securities

Moving on from payments to securities settlement issues, the issues at stake are hardly less challenging. The need for action at European Union (EU) level to improve clearing and settlement processes in the EU has been highlighted recently in two communications by the European Commission on financial markets and competition. The current cross-border arrangements in the EU are complex and fragmented and impose excessive costs, risks and inefficiencies on investors, institutions and issuers. The documents published by the Commission show the variations in cost structure among different EU markets and how a more (integrated and) efficient post-trading infrastructure could lead to a reduction in transaction costs of up to 18%. This, in turn, could increase GDP by around 0.6% in subsequent years.

This confirms that we need an integrated infrastructure, but it is easier said than done! How can we achieve this in practice? I would like to stimulate reflection on three main aspects.

2.1 Integration is a slow but continuous process

First, Rome was not built in a day. Nor was, for instance, the integrated securities infrastructure in the United States. It may be worth recalling that the

process of integration in the United States started in 1975 and was completed in 1999 with the creation of the Depository Trust and Clearing Corporation (DTCC). The process of integration took just under 25 years in a country with a single currency, a single system of central banks, a single regulator, a single legal framework, and, last but not necessarily least, a single language. In the European Union, we have 14 currencies, one system of central banks and 13 non-participating central banks, more than 50 regulators, 25 legal systems and about 20 languages. In the euro area things are a little better, since we at least have a single currency and a single system of central banks. It is clear that we cannot expect a rapid solution, but it is important to have a clear vision of what we would like to achieve or at least of what we do not want to achieve.

The process of integration is already under way: it started six years ago following the introduction of the euro. Since then, some progress has been made moving on from a situation in which cross-border securities settlement was just "possible" towards a truly European domestic infrastructure. One example is the increase in the use of cross-border collateral for Eurosystem credit operations from 16% in 2001 to 45% in 2005. Progress has also been made on the consolidation of central counterparties (CCPs) and central securities depositaries (CSDs): the number of CCPs fell from 14 in 1999 to 7 in 2005, while the number of CSDs fell from 22 to 9 over the same period. In some cases, consolidation is leading to lower transactions fees. For instance, this has been the case for Euronext, and is foreseen to be the case for the Nordic CSDs alliance. Nevertheless, the market is still fragmented, further integration is required, and Rome is still a long way off.

2.2 There is no single recipe for integration

Second, all roads lead to Rome, i.e. there is not necessarily an optimal recipe/model for achieving integration. The US model (two CSDs and one CCP for securities) is not necessarily the benchmark for Europe. The different starting point may justify a different path. Now, necessity is the mother of invention and, here, the invention is called "interoperability". What interoperability actually means in practical terms in the field of post-trading infrastructure remains to be defined. One peculiar aspect of the European infrastructure seems to be that interoperability encompasses the concept of vertical and horizontal integration and can only be achieved as a joint effort by all interested players: not only stock exchanges, central counterparties, central securities depositories, but also central banks, as providers of payment and collateral management services. Cooperation is helpful because many hands make light work, but it is also necessary because a chain is no stronger than its weakest link.

2.3 The role of authorities

Third, there is no doubt that the process of integration should be marketdriven. However, this does not mean that authorities should just stand back and wait and see. Action by authorities is warranted in the event of market failures. Some markets can be reluctant to change (the first step is always the hardest and old habits die hard) and the different time horizon of costs (today) and revenues (tomorrow) relating to the necessary investments may increase this reluctance. Moreover, market forces may not be able to take all the necessary steps to ensure effective competition as well as the stability of the infrastructure. It is not a coincidence that, to date, the most successful example of integrated infrastructure has been the establishment of the TARGET system for settlement of large-value payments. It should be noted that TARGET was created not by the market, but by the central banks.

Moreover, action is required to remove legal and fiscal barriers to integration. In this respect, the Eurosystem welcomes the initiatives specified in the communication by the European Commission and, in particular, supports the adoption of a framework directive on clearing and settlement. A directive could complement the market-led removal of barriers to integration and contribute to ensuring fair and open access and price transparency. This is, in turn, a necessary condition to ensure effective competition. The Eurosystem also deems it important that the EU securities infrastructure is adequately protected from financial and operational risks and that no regulatory arbitrage is introduced by the adoption of inconsistent or diverging regulatory standards in Europe. The Eurosystem therefore takes the view that the finalisation and implementation of the ESCBCESR standards for clearing and settlement are essential to ensure the sound and smooth functioning of the EU financial infrastructure.

Conclusion

I hope I have succeeded in touching on the main drivers of change in payment and securities settlement systems and I am now looking forward to the presentations of the three panellists who will provide more detail on these issues. As none of them needs to be really introduced to you, let me just say that I am very proud to chair such a distinguished panel:

Alberto Giovannini fights on a day-to-day basis for a comprehensive programme of fostering integration in the field of securities settlement. It is a bit unfair to him that we speak about "Giovannini barriers" as if he had some responsibility himself for the persistence of these obstacles. Instead, we should speak about the "Giovannini vision" that his report so convincingly put forward.

Christian Noyer is in the driving seat of building a dynamic and competitive European economy and represents an important financial sector. With his leadership and clear-sightedness, he helps the industry to seize the large opportunities that an integrated Europe offers.

Anthony M. Santomero combines in an impressive manner the world of academia and central banking. The US financial sector provides to some extent a blueprint for an integrated financial sector in Europe. Therefore, it is particularly interesting to listen to the assessment by someone who has helped so much – through practical as well as well academic contributions – to shape the financial sector.

The challenges of integration in Europe

Alberto Giovannini[1]
Unifortune Asset Management

1 Introduction

In Europe, the financial system plays a central role in economic development. The essential functions of the financial system are the allocation of resources towards the most productive uses, and the allocation and optimal distribution of economic risk. Through these functions, the financial systems contributes to reward the most productive sectors of the economy, and to phase out the less productive sectors. It also helps re-cycle capital and labour employed in less productive sectors. It is apparent that the evolution of EU societies and economies from regimes characterized by state intervention to market economies (an evolution that is, arguably, incomplete) requires an efficient financial system to take up roles that in the past were carried out by governments, often with disappointing results.

Yet, the current structure of the financial system in the EU is faulty. The EU financial system does not really exist as a single, integrated entity. It is rather the sum of national financial systems. Of course, national financial systems are not isolated from each other, in the sense that there is almost complete free trade in financial assets and financial services across the different member states. However, it is important to make a distinction between the absence of prohibition to trade with other EU member states, and the presence of hindrances and costs to cross border trade. These hindrances are very often unintended, as they represent an inheritance from a not-so-distant past: they originate from the largely national

[1] This article draws on my work as an advisor to the EU Commission in the area of post-trading. Many of the ideas in this article were developed previously and appear in Giovannini, Berrigan and Russo (2006). I am very grateful to Sean Berrigan, Godfried de Vidts, Mario Nava, Daniela Russo and David Wright for having clarified my ideas on these issues over many years of work together.

nature of financial intermediation in European countries which were until recently isolated from each other by the prohibition to cross-border trade in assets and financial services. Nationality is reflected, well beyond the use of different languages (an issue that is of second-order importance in finance), in the use of different technical standards, market conventions, rules and regulations that are country-specific.

The EU Commission and the European Central Banks are the most powerful sponsors of an integrated, efficient EU financial system. Their sponsorship originates from different, though related, incentives that drive the two institutions. In the case of the EU Commission, the desire to build an integrated and efficient financial system stems from the desire to support economic development by eliminating all barriers to trade, explicit or implicit. In the case of the European Central Bank, an efficient and integrated financial system represents an essential pillar for macroeconomic stability in the region where its mandate extends; in addition, a well-working financial system is a key enhancer of its own monetary policy tools aimed at controlling liquidity in the region and, indirectly, affecting inflation and inflationary expectations.

The purpose of this paper is to describe the process of construction of the EU financial system from the perspective of its foundations: the functions of clearing and settlement of securities. Because the status quo is characterized by inconsistent standards, conventions and rules, the process of reform is necessarily one of liberalization, through the elimination of these inconsistencies, which represent barriers to cross-border securities trade. There are a number of complicated, and interesting, aspects of this process. First, it has to operate across two different dimensions: the various member states and the different institutions. Second, it has to involve both private agents and authorities. Third, it has to tackle effectively the conundrum of national monopolies. Suppose that certain market infrastructures are monopolies. In a fully integrated EU market national monopolies make no sense, since they prevent the full exploitation of economies of scale, which is achieved by EU-wide consolidation. The question is therefore how to manage the transition from national monopolies to the EU-wide institutions[2].

The structure of this paper is as follows. Section 2 discusses the problem of post-trading (clearing and settlement, C&S) in the EU. Section 3 illustrates the underpinnings of C&S market reform. Section 4 describes the reform strategy. Section 5 discusses some of the key questions around the reform process. Section 6 contains a few concluding remarks.

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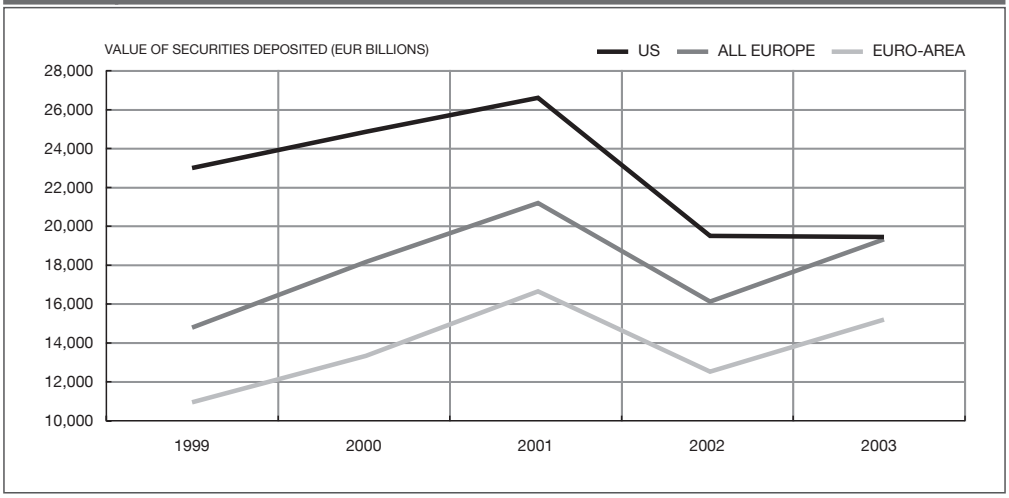
[2] The relevance of this question hinges on the realism of the starting hypothesis, that economies of scale in the industry provide a powerful momentum towards monopolistic provision of infra-structural services. Several of the propositions put forward in this paper would apply even if instead of a single supplier, the market was characterized by the coexistence of few large suppliers.

FIGURE 1 **ASSETS UNDER CUSTODY OF SELECTED SECURITIES SETTLEMENT SYSTEMS**



SOURCE: European Central Bank.

2 A system faulty at the core

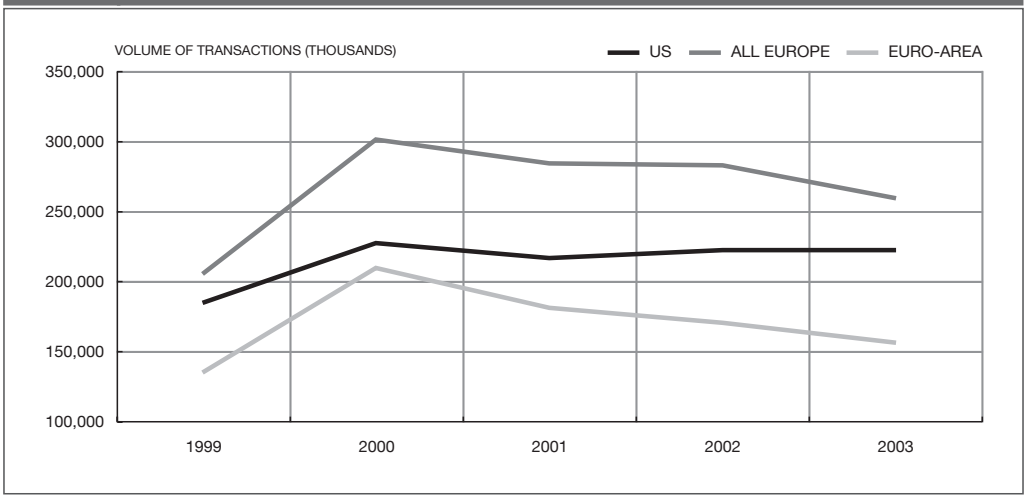
C&S represent the core of the financial system. They are the physical and virtual arrangements that ensure that each buyer receives what he or she has paid for, and each seller receives the value of what he or she has sold. Financial intermediation is based on financial trades which are overwhelmingly trades in securities or derivative contracts. C&S of securities and derivatives are thus the core of the financial system. By setting the rules and procedures that make financial transactions possible, C&S arrangements define a financial market. Once the rules and procedures to effect securities transactions are set, the rules determining how buyers and sellers meet and how prices are specified can be easily chosen. Recent experience has demonstrated that C&S are deeper and heavier than trading structures: for any given C&S infrastructure, trading venues can be more easily created and modified, often in competition with each other[3].

Over the years C&S infrastructures have developed in a way to maximize efficiency and safety of securities transaction. A clear pattern is observed in every country: there is maximum consolidation of central counterparties and of central securities depositories. Such consolidation is most frequently supported by regulations granting monopoly powers to central counterparties and central securities depositories.

What justifies maximum consolidation of C&S infrastructures? It is helpful to think about the technology underlying these functions. C&S rely on technologies

[3] Indeed, there are a number of cases, in the US and in Europe, of trading venues that have used vertical integration as a device to protect themselves from competition.

FIGURE 2 **INSTRUCTIONS HANDLED BY SELECTED SECURITIES SETTLEMENT SYSTEMS**



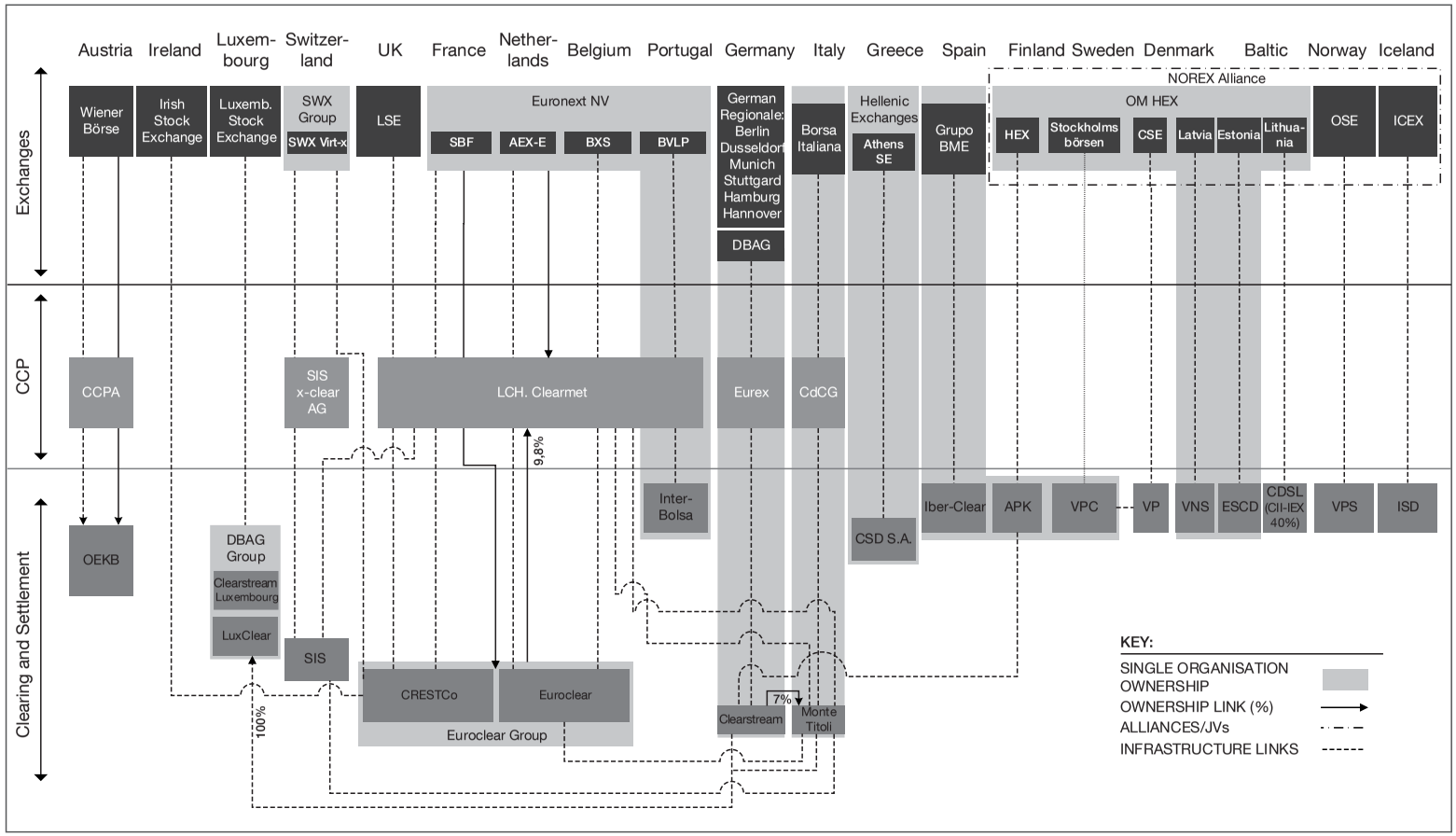
SOURCE: European Central Bank.

that are well approximated by zero-marginal cost curves: there is an investment in information infrastructures that when are in place can be scaled up almost costlessly. For this reason it is in the best interest of the market that C&S infrastructures achieve the maximum consolidation possible: only in this case would the cost of these infrastructures be minimized. In addition, there is also a risk argument for maximizing consolidation. The larger the number of counterparties in the C&S infrastructures the more efficiently the risk of a default of a single entity can be shared in the market, and the spreading of a single entity's default is contained. The larger the number of counterparties and transactions going through the C&S infrastructure, the larger the possibilities of collateral netting and therefore the lower capital requirements to effect securities transactions.

Figures 1 and 2 illustrate the size and potential of an integrated EU securities market. Figure 1 reports the value of the assets under custody in the EU, the Euro-area and, for comparison, in the US. Figure 2 reports a measure of transactions volume in the same three markets. Interestingly, the figure shows that the number of instructions handled by the sum of all securities settlement systems of the EU significantly exceeds that handled by US securities settlement systems. This difference does not necessarily indicate that the EU securities market is larger than the US, since in the case of the latter country integration is such that netting of transactions is much more significant, and therefore the instructions making their way to the settlement system are comparatively fewer.

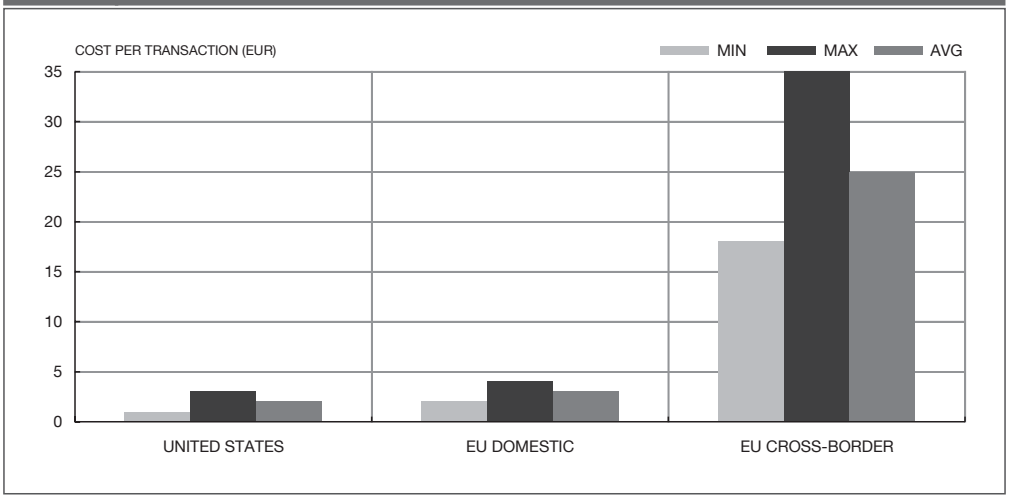
It is apparent that when we consider EU securities markets a s a whole, a structure of national monopolies is inconsistent with a liquid and efficient EU-wide securities market, because it does not permit the achievement of the potential cost savings aris-

CHART 3 **CASH EQUITY LANDSCAPE IN MAJOR EUROPEAN MARKETS**



SOURCE: Merrill Ljnch; Euroclear; Accenture; company information.

FIGURE 4 **COMPARISON OF DOMESTIC AND CROSS-BORDER COSTS**



SOURCE: European Central Bank.

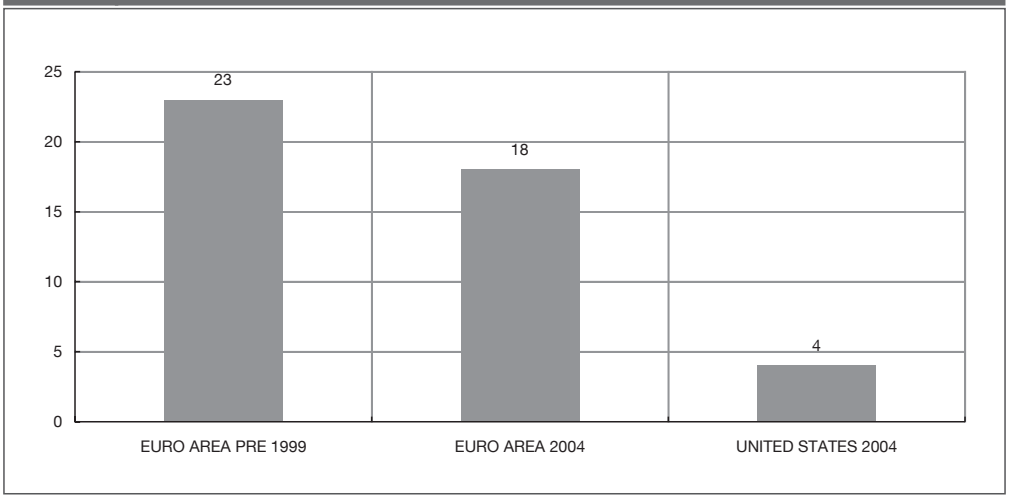
ing from consolidation. Furthermore, national C&S infrastructures have developed together with a long list of technical standards, market conventions, rules regulations and laws that reflect every individual national financial market, and that are not coherent with each other. National monopolies and incoherent standards, conventions, rules and laws are the faults at the core of the EU financial system.

The fragmentation is significant, as well as the complexity of governance structures of market infrastructures. Figure 3 illustrates the structure and governance of trading and post-trading in the case of cash equities. The figure shows a number of facts. First, the sheer fragmentation of equity trading and post-trading when one looks at the EU as a whole. There are very few structures that service more than one national market. Second, the presence of both horizontally (LCH Clearnet, CRESTCo, Euroclear) and vertically (Deutsche Borse, Borsa Italiana, Latvia, Estonia) integrated structures.

Figure 4 illustrates the effects of fragmentation, by comparing the costs of domestic transactions and cross border transactions in the EU. For the sake of comparison, the figure reports also the cost of a domestic transaction in the US. The figure shows that the cost of domestic transactions are comparable in the EU and in the US. By contrast, the cost of a cross-border transaction in the EU is many times the cost of the same transaction within borders. This fact was first illustrated in Giovannini Group (2001). The prime suspect for such huge differences in cost are the faults I have mentioned above: national monopolistic structures, largely isolated from each other, incoherent standards, conventions, rules and laws.

One of the most relevant facts in today's environment is that despite the still significant inconsistencies across the various national post-trading infrastructures

FIGURE 5 **SECURITIES SETTLEMENT SYSTEMS**



SOURCE: European Central Bank.

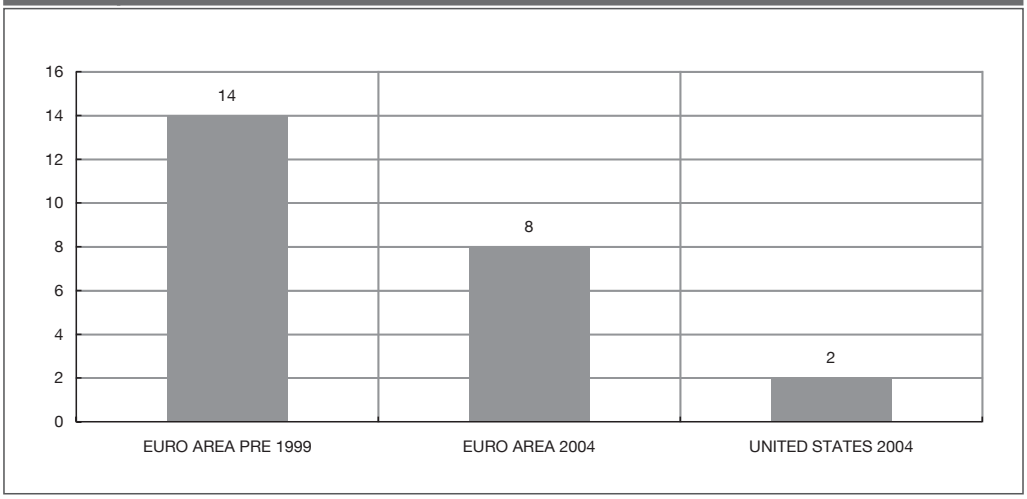
there exist a momentum to consolidate. This is illustrated in Figures 5 and 6, which focus on Euro-area countries. Figure 5 shows the number of securities settlement systems in the Euro-area before 1999 (the year of the introduction of the Euro) and in 2004. Figure 6 shows the number of central counterparties in the same dates. Both figures show that there has been a decrease in the number of providers. Yet, when comparing the Euro-area with the United States, it is apparent that there is much more room for further consolidation.

Where does the pressure to consolidate come from? The most plausible hypothesis is that, despite the fragmentation of the market, there exist gains to be made by consolidating infrastructure platforms. Indeed, the recently announced deal between the New York Stock Exchange and Euronext is an illustration that consolidation gains are available even in the case of two markets that are characterized by different standards and regulations, even though issuers and investors are by and large free to access them both. In addition, the opportunities from consolidation would much increase if inconsistent standards, conventions and rules across the EU are eliminated. It is plausible that many providers are moving towards consolidation in the expectation that this will indeed happen. In the next section I discuss reform initiatives.

3 Market reform

The need to reform post-trading in Europe has been felt only relatively recently. The Financial Services Action Plan, a comprehensive reform process designed by

FIGURE 6 **SECURITIES CENTRAL COUNTERPARTIES**



SOURCE: European Central Bank.

the European Commission to create a single financial services market in the EU did not mention post-trading in its initial drafts. It could be argued that several EU policymakers had been of the view that, once the Euro was introduced and prohibition to trade securities and financial services cross border were lifted, market infrastructures would somehow adapt themselves. This view could certainly be shared, but leaves open the question of whether market evolution would be too slow to deliver the efficiency gains that a truly integrated post-trading infrastructure could offer.

The two so-called Giovannini Reports (Giovannini Group, 2001 and 2003) put together existing wisdom[4] on the causes and effects of fragmentation in EU post-trading infrastructures. The contribution of the two reports has been to explain that the present infrastructure is not just the effect of differing regulations but is also determined by differing technical standards and differing market conventions. These all developed together and work together. The whole post-trading environment is thus the result of the complex interaction of rules issued by national authorities and rules of the game in markets.

The Giovannini Reports identified 15 barriers to efficient post-trading in the EU. The barriers are caused by inconsistencies due to technical standards and market practices, to the requirements of tax compliance in different countries, and to differing legal definitions of securities ownership. They are listed in Table 1. The analysis of barriers is a device that highlights the extent to which the post-trading market is fragmented and helps to focus on practical initiatives aimed at eliminating the barriers.

[4] The Group of Thirty in particular has devoted significant resources in studying and explaining the importance of efficient post-trading in global financial markets.

TABLE 1 **THE 15 BARRIERS TO EFFICIENT CLEARING AND SETTLEMENT IN THE EU**

Technical requirements/market practices
Diversity of IT platforms/interfaces
Need to maintain multiple membership of settlement systems
National differences in rules governing corporate actions
Differences in the availability/timing of intra-day settlement finality
Impediments to remote access
National differences in settlement periods
National differences in operating hours/settlement deadlines
National differences in securities issuance practice
Restrictions on the location of securities
Restrictions on the activity of primary dealers and market-makers
Taxation
Withholding tax procedures disadvantaging foreign intermediaries; and
Tax collection functionality integrated into settlement system
Legal certainty
National differences in the legal treatment of securities
National differences in the legal treatment of bilateral netting; and
Uneven application of conflict of law rules

The second report (Giovannini Group, 2003) produced a structured set of initiatives aimed at eliminating all of the 15 barriers. The structure was built as follows:

- For every barrier, one or more entities directly responsible for coordinating actions aimed at its elimination were identified;
- A temporal sequencing of these initiative was established, based on the functional relations existing among the different standards, conventions and rules;
- A set of deadlines were offered, representing a minimal time frame estimated as necessary to complete the initiatives described.

The two reports have been widely publicized and have been discussed throughout the industry. Nobody has challenged either the analysis of the reports, in particular the finding on the exorbitant relative costs of cross-border post-trading services versus the same services for transactions within the same country, or the method of reform.

In particular there have been significant endorsements from public authorities. The European Commission published a Communication (Commission of the European Communities, 2004) fully supporting the reform process described in the second Giovannini Report. The European Parliament has declared that C&S reform is essential for EU prosperity (Contribution of the European Parliament to the Commission's Legislative and Work Programme, 2006), and, finally, the Commission has included C&S among the highest priorities for efficiency-inducing reforms (the so-called Lisbon Agenda). All of these statements are to be welcome, considering that a few years ago among EU policymakers awareness on the importance of market infrastructure was at best limited!

4 The reform strategy

When discussing reform of market infrastructures the first option that is normally considered is the so-called top-down option, that is the option of creating new EU-wide providers through a government initiative. The precedents of successful top-down initiatives are important. In the United States, as recently as in 1999, the Depository Trust Company, or DTC, and National Securities Clearing Corporation, or NSCC, which clears and settles trades in equities, corporate bonds, municipal bonds, unit investment trusts and exchange-traded funds, were consolidated into a new group whose holding company was named Depositary Trust and Clearing Corporation, or DTCC. This was the most significant and most recent step in a long process of consolidation of post-trading infrastructures, driven mainly by users, which occurred through progressive dismantling of vertically-integrated structures of exchanges and post-trading platforms, and horizontal consolidation[5]. So, while the US experience is normally hailed as a successful top-down, one-shot, consolidation coup, in reality it is, as Considine (2006) explains, a process of progressive adaptation of structures and market rules (including rules granting remote access) which facilitated consolidation. Such consolidation was arguably driven by the users community, but at the same time consistently supported by authorities.

Another successful experience that is often recalled is that of the creation, in Europe, of the European Central Bank (ECB) and the overnight transition from many distinct currencies and legally independent monetary policies into a single currency managed by a single institution. The ECB is the entity responsible, among other things, to manage the system of cash payments in the Euro Area. Would it not make sense to create an entity that manages the systems of securities payments?

[5] See, in particular, Considine (2006).

To understand the strategy for reform that is being currently pursued it is useful to make a distinction between framework and architecture. Framework is the sum of standards, conventions, regulations and laws whose inconsistencies are the causes of the barriers to cross-border C&S. Architecture is the structure of the C&S industry: how many suppliers in each segment, how much specialization there is, how large are suppliers relative to the market. The strategy chosen by the EU Commission, in close consultation with users and suppliers, has been to concentrate on framework, and leave architecture aside for the time being.

There are three, partly related reasons for this choice:

1 Without an appropriate framework, post-trading would be inefficient, no matter the architecture, and even with the maximum degree of consolidation. The reason is that inappropriate framework is the deep cause of costs in post-trading. These costs would not be eliminated by consolidation.
2 Even if all barriers were eliminated, that is if the framework was fully optimized, there is not a universally preferred architecture for C&S. In particular, there are several institutions that consider themselves candidate to provide the pan-EU post-trading services.
3 There is a preference in the EU Commission of letting markets choose the preferred architecture once the barriers are completely eliminated.

In theory, it is possible to describe the fundamental drivers in the industry after the elimination of the cross-border barriers. As I have mentioned above, one of the key technological features of C&S is that they are services performed at nearly zero marginal cost. An additional fundamental characteristic is that such services cannot be differentiated: they are standard processes, which are getting more and more uniform internationally. Suppose there are a number of national monopolies providing post-trading services, and that the EU market, previously burdened by almost-prohibitive costs of cross-border C&S gets completely liberalized (all 15 barriers are completely eliminated). What will be the likely outcome on the structure of the industry? Krugman (2004) shows that, if technology is identical, the larger supplier will have the lower cost. Thus it will be able to gain market share at the expense of the smaller, higher cost suppliers. In doing so, it will be able to further decrease costs. At the end of the process, the larger supplier will become the monopolistic, EU-wide supplier. Alternatively, and more efficiently, a series of cross-border mergers of national suppliers, aimed at eliminating wasteful technological duplication, would achieve the same result.

Of course, the choice of concentrating on framework is a choice about logical precedence, not time sequence. Nothing prevents the various actors, private or public, to organize themselves in the expectations of progress in the elimination

of cross-border C&S barriers. In particular, it is also possible that cross-border consolidation ahead of framework reform could help put pressure on the various interested parties to accelerate framework reform.

As I have recalled above, reform is carried out by a multiplicity of actors, public and private, in a multiplicity of countries. It is not a centrally-directed effort, and there is no "Deus ex machina". The EU Commission has so far played the role of stimulating analysis and initiatives, and of coordinating action. Coordination is managed through management of information flows. The instrument for this work is CESAME, the Clearing and Settlement Advisory and Monitoring Expert Group, a group setup and presided by the Commission (DG Markt), that meets periodically (about twice yearly). CESAME monitors progress in the initiatives that have been associated with the 15 Giovannini barriers. It collects information about all the work, including analysis, carried out around the barriers. It makes available the information to all interested parties and, finally, it provides advice to all interested parties, including and especially the Commission. CESAME is also attended by the European Central Bank, CESR (the Committee of European Securities Regulators), and the Group of Thirty. CESAME is flanked by two other groups: the Legal Certainty Group and the Fiscal Compliance Group. These two groups are formed by national legal and tax experts. They carry out the analysis that is needed in the effort to eliminate barriers due to inconsistent definitions of securities ownership across different countries, and those caused by tax compliance in the different EU member states. This analysis is expected to produce practical ideas that will allow a re-writing of national laws and regulations. The new national laws, defining securities ownership will achieve the dual objective of being more suited to the way securities are exchanged in modern markets, which rely heavily on information technology, and at the same time of being consistent across EU member countries. The new regulations on tax compliance could be designed to remove artificial barriers on the holding of securities and therefore on cross-border clearing and settlement.

The philosophy of CESAME, of the Legal Certainty and the FISCO group is twofold. First of all, the groups are a conduit for consultation with all interested parties. In addition, however, these groups and the way they work ensure a more democratic reform process. By participating in this process interested parties not only will consult with authorities but also with other (potentially opposed) interested parties. All of these exchanges are made available to the public, through timely publication on dedicated websites. As a result, the risk of capture is minimized.

There are important asymmetries in the way standards and conventions are reformed and the way rules regulations and laws are reformed. In the case of standards and conventions – the private-sector rules of the game – the process by which they are designed is relatively straightforward, and has not, in the experience so far, shown any particular difficulty, even in the cases where lengthy and elaborated procedures have been used, like for example for new SWIFT messaging standards.

However, once new standards and conventions are established, there is no mechanism ensuring their adoption. Adoption is voluntary, and is evidently subject to a coordination externality: the more users will want to adopt them, the faster they will be adopted, viceversa, if adoption is slow, it could easily fail[6].

Consider now the case of laws and regulations. Once they are promulgated, they are automatically abided to. Because by their nature they come immediately into force, rules and laws have a much more elaborate gestation period. This asymmetry between the process by which standards and conventions come into force and the process by which rules and laws come into force makes the work in venues like CESAME more difficult. The kind of effort required to ensure adoption of new standards and conventions is very different from that required to support a proper decision process by authorities. This is the case even though there are substantial synergies across the different activities, and it is such synergies that the CESAME is meant to maximize.

5 The practice and the challenges of reform

To put the challenges of the reform of Clearing and Settlement in Europe in perspective it is useful to think about an abstract case. In this exercise I will highlight the key assumptions.

Consider the case of separate national financial markets. In each national market there is a securities market infrastructure service provider (for simplicity I do away with the distinction between clearing and settlement, without in any ways advocating the integration between the two). The securities market infrastructure service provider is a computer system (more properly, an IT department) with an administration department. Let us assume that it is a private company. This company's business is to process large volumes of information in the most efficient possible way. I assume that the company does not take counterparty risk: whatever counterparty risk it cannot perfectly diversify away is easily sold to an insurer. The biggest business risk of the securities market infrastructure service provider is technology risk: periodically the company has to make important technology investments to upgrade its systems and keep up with the pace of information and communication technology progress (which will be dictated by its customers, as well). The investments are lumpy. Their efficiency is uncertain. The earlier adoption allows faster cost reduction and service enhancement, but at the same time it is subject to higher implementation risk.

[6] Sometimes there are catalysts available, which help avoiding coordination failures. For example, the introduction of Target 2 by the European Central Bank represents a deadline for the harmonization of opening hours and settlement deadlines.

These assumptions help identify the two key features in the business of securities market infrastructure. The first, static, feature are economies of scale. Processing information does not require any active decision on each individual piece of information (transaction) processed: all transactions are processed passively. Hence, the marginal cost of each transaction processed is, for all intents and purposes, zero. It is in the interest of the provider and, indirectly, of its customer, that the infrastructure serves the entire market: this business is a natural monopoly.

The second feature of this business is dynamic and stems from the fast rate of progress of the information and communication industry. The correct management of the investment cycle is the most important determinant of the cost and quality of service of the securities market infrastructure provider.

It is apparent that the two key features of the infrastructure service provider business can interact to produce outcomes that are less than optimal. If economies of scale make the business a monopoly, the managers of the monopoly may invest in technology at a rate that is less than the optimal one[7]. In addition, managers will also likely have an incentive to bundle the essential infrastructural services with other services, exposed to competition, in order to maximize the value of the former by (at least partially) shielding the latter from competition. Finally, the monopolistic service provider will have the incentive to extract the consumer rents by charging different prices to different users. These incentives would manifest themselves in the standard case where the infrastructural service provider is run as a private company, and the task of the managers is to maximize the value of the company.

What happens, in this abstract model, when the national markets, hitherto separated by non-tariff barriers, get integrated, or are expected to get integrated over a foreseeable period of time? The biggest opportunity is represented by the cost gains achievable in the larger, integrated market. As we already pointed out, other things equal the larger player would eventually get the entire market, by being able to charge the lowest prices (and it could also afford more than the other to engage in predatory pricing). Alternatively, scale could be gained by progressive integration of all the service providers in the new, integrated, market. This integration could start in the expectation of the removal of the barriers. At the end of the competitive game, or integration process, the new monopolist will face the same incentives of the monopolists in the smaller, non-integrated, national markets.

It is evident that the elimination of the barriers to clearing and settlement in Europe is going to leave open a number of important questions regarding the ef-

[7] Lower cost technologies will be adopted if their impact on profits justifies the investment. In the case of a monopoly and in the presence of technology risk, it is plausible that new processes are adopted when uncertainty on their productivity is low. This may cause a less than optimal rate of technological progress. In the case of more than one market actor, technology is adopted as a way to gain market shares, or as a defensive device. Hence technology investments would be faster as we move away from monopoly.

ficiency of the infrastructure. The EU Commission has, since its Communication on Clearing and Settlement (2004), pointed out that the likely, and desirable, consolidation of the industry to be expected as a result of the removal of the barriers, opens up questions regarding the governance of the service providers. The Commission has mentioned governance as an ex-ante mechanism that may help minimize the distortions associated with monopolistic profit maximization.

Most infrastructure service providers are private companies, whose objective is the maximization of profits. This relatively new market structure follows a wave of privatization and demutualization of these companies[8]. While it is difficult to verify whether the rate of technological investment by service providers is the optimal one, it is easy to verify that bundling and price differentiation are strategies almost universally followed. These facts are consistent with the model I laid out above.

How has the joint problem of barrier removal and creation of an efficient consolidated EU infrastructure been dealt with so far? As mentioned above, the reform process entails a number of actions to be carried out by the private sector and a number of initiatives from public authorities. At the time of the writing of this essay (September 2006) the parties that have been charged with initiatives in different areas have generally responded constructively and energetically, and have brought about new standards and conventions. Yet, as I pointed out in the previous section, the critical juncture is the adoption phase. By its very nature, adoption is a lumpy process: thus it is too early to pass judgement on whether private sector reform is progressing at a satisfactory pace.

A similar difficulty characterizes the assessment of progress in public authorities initiatives. Table 2, reproduced from the EU Commission, contains an analysis of the overall reform effort, and highlights the authorities' potential initiatives.

Since the publication of that study, Commissioner McCreevy has made a move. He has distributed a code of practice to industry participants, asking them to put measures in place that address a number of items in Table 2. The measures are:

1 Price transparency: a number of measures designed to minimize price discrimination and make it easy to estimate the effective cost of essential post-trading services, including the publication of all pricing schedules, the disclosure of rebates and other reduction schemes and transparent billing;

[8] Many have hailed demutualization as the cause of greater efficiency and profitability of many infrastructure companies (this is observed especially with reference to stock exchanges). I suspect that greater efficiency and profitability, a boom of transactions, have occurred because of a number of concurring factors, including, for example, the birth and growth of retail internet trading.

TABLE 2 **THE EU COMMISSION'S ANALYSIS ON PUBLIC AUTHORITIES REFORM INITIATIVES**

Objectives		Specific objectives	Policies and measures	Rationale	Practical initiatives
Efficiency	Level playing field	Integration	Ex-post competition policy	Tackle abuses of dominat positions, including discriminatory practices	Investigations and decisions by the Commission and national competition authorities
			Dismantling of market, legal and fiscal barriers	Liberalisation of the cross-border distribution of C&S services, increase of competition and cost reduction	CESAME group (market barriers)
					Legal Certainty group (legal barriers)
					FISCO group (fiscal barriers)
					Directive (access and location issues) - To be tested in the RIA
			Ex-ante competition legislation	To increase pricing and cost transparency as a means to make the detection of possible abuses of market power, and therefore distortions of competition, by SSSs/CCPs, easier	Directive (governance rules, i.e., account separation and unbundling of services) - To be tested in the RIA
Safety		Financial stability and investor protection	Common regulatory and supervisory framework	Facilitate the integration of systems. Addressing the issue of diverging treatment of similar concern by national authorities	Directive - To be tested in the RIA

2 Interoperability/remote access: an interoperability protocol to be adopted with the elimination of the rest of the Giovannini Barriers, full rights of remote access across all industry participants: central counterparties, central security depositories, and exchanges;
3 Unbundling/accounting separation: an incomplete list of standards has been distributed, highlighting which of the functions of a CSD should be unbundled from others, and for which accounting separation will be required.

The code of practice touches upon only one issue that is related to the cross-border C&S barriers: the very important problem of remote access. The two other items in the code of practice are about mitigating distortions associated with monopolistic behaviour by service providers. However, what is prominently absent in this initiative is the legislative part. Legislation will be needed for:

– Eliminate restrictions on the location of securities
– Modify national laws to ensure legal certainty of securities transactions throughout the EU

In addition, legislation may be needed to draft safety standards to allow entities to access remotely clearing and settlement services, and to remove barriers related to tax compliance.

The absence of legislation is due to an often-declared aversion of Commissioner McCreevy to new laws and regulations. His views are inspired by the belief that the structural lack of knowledge of lawmakers and regulators more often than not misguide their actions. It is hard not to sympathize with these opinions, although, as I argue below, sometimes the costs of no legislative action may be significant. The Commissioner's preferences probably best explain the outcome that we currently observe. Many other parties have also expressed scepticism towards legislative initiatives by the Commission. This scepticism is largely due to a defensive attitude on the part of those entities that presumably would be most negatively impacted by legislation. However, and more seriously, it is also the result of a generalized scepticism about the EU political process: many experts of EU affairs[9] have mentioned the risk that a directive could be badly distorted from the time it is delivered by the technical offices of the Commission to the time it becomes effective[10].

Thus, the main challenge to the reform of post trading in the EU is one of coordination of the public sector with the private sector. The first initiatives of the public sector reflect, as I pointed out, scepticism towards legislation. But, as a result, the reform process is started in a somewhat lopsided way. This may have sent the wrong message to private market participants – those in charge of pushing reform of standards and conventions, and of adopting those reform. It can be argued that the timid approach of authorities may lead to a timid response of the private sector, and to a general slowdown of the reform process.

On the other hand, this relatively slow start may be just that, only a start. Nothing prevents more decisive and incisive action in the future. Acceleration of public and private initiatives could occur at any time, and could feed on each other.

6 Concluding Remarks

The financial system performs functions that use intensively information and communication technology. Through the mechanics of competition, the financial system strives to achieve ever lower-cost ways to deliver its functions to the marketplace.

The basic framework of the financial system is a set of conventions and standards (private rules of the game) and regulations and laws (public rules) which

[9] Including, disturbingly, Members of the European Parliament!

[10] This difficult problem, which the Lamfalussy process was designed to address, is beyond the scope of this paper, and orders of magnitude more important than the problem of building efficient post-trading infrastructure for the EU securities market.

underlie the web of private contractual transactions that make the financial system work. Thus, in order to evolve in the direction of providing ever lower-cost services or, ceteris paribus, more efficient services, the financial system needs every once in a while to adapt its basic framework to changing circumstances and opportunities. When we use the term "financial system reform" we implicitly refer to reform of laws and regulation, to a process which involves active participation from public authorities. Hence, financial system reform and the evolution of the financial system are very close phenomena. It is apparent that, because of the importance of public rules (laws and regulation), an efficient evolution of the financial system needs a pro-active attitude by authorities.

In this paper, I have described and discussed the challenges facing the C&S services in the EU financial system. These challenges arise from the complicated interactions of private market participants and authorities. The choices of the former have to be consistent with the actions of the latter, but the special features of the EU political process (by which I mean the decision making process of EU authorities) make ensuring that consistency a complicated affair.

Prima facie, there are two kinds of market failures that deserve attention by authorities. The first kind is, trivially, associated with the country segmentation of clearing and settlement services. This phenomenon, by now well understood, prevents generalized, low cost access to securities markets throughout the EU. The segmentation could be easily dealt with through the removal of the 15 clearing and settlement barriers described above. The second kind of market failure has to do with the behaviour of (quasi) monopolistic providers of post-trading services. Monopolistic providers have incentives to charge excessively high prices through opaque pricing policies, they have incentives to bundle the service protected by the monopolistic market structure with other, competitive, services, in order to maximize the value of the overall business, and they have incentives to upgrade their technology at a rate that is less than optimal.

What has been the progress so far? EU authorities have led a novel and efficient process of exchange of information, aimed at sharing the broad objectives and the method of analysis. A number of practical initiatives have been undertaken by the private sector and by the EU Commission. Based on the record, one is tempted to conclude that the progress towards the "ideal" post trading infrastructure in Europe is so far slow, to the point that forecasting its completion appears an impossible task.

Yet, progress is discontinuous for two reasons. The adoption of new and more efficient market standards and conventions is, as explained above, a nonlinear process due to coordination externalities: small progress so far does not mean that a dramatic acceleration cannot occur in the near future. Similarly, the fact that public authorities have not so far displayed the boldness that some were hoping for or expecting does not imply an acceleration of initiatives, including those required to provide the appropriate legal and regulatory framework for European post trading.

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Recent developments and policy challenges affecting large-value and retail payment systems in Europe

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It is a great pleasure for me to be here in Madrid to share with you some thoughts about recent developments and policy challenges affecting payment systems in Europe.

Indeed structural changes are underway in Europe that should have a significant and positive bearing on the efficiency and safety of the payment infrastructures, notably in the wake of the implementation of the TARGET2 and the SEPA projects. Both projects are part of the overall process of the Lisbon agenda which aims at making the European Union "the most competitive and dynamic knowledge-driven economy by 2010".

However, for Europe to reach that objective in the field of payment systems, a number of collective challenges have to be addressed, both by private actors and public authorities. Those challenges range from the redefinition by private actors of the boundaries between cooperation and competition, to the adjustment by public authorities of the legal and regulatory environment in which payment systems operate.

In that context, the Eurosystem's central banks have a key role to play, given their statutory task of promoting the smooth functioning of payment systems in euro.

I will first review the key issues we are facing in Europe in the field of payment infrastructures. Then, I will discuss the current and possible future roles that the Eurosystem's central banks can play in that field.

1 Key issues in the field of payment infrastructures today

The three main issues I see as regards payment infrastructures today in Europe could be summarised as follows:

1 Which role for payment infrastructures to support the European financial integration?
2 Which place to give to technological progress in the field of payment systems?
3 How to ensure business continuity of payment systems?

1.1 Supporting the European financial integration

The share of payment systems in money transfers between financial intermediaries is nearly 80%, versus 20% for the traditional correspondent banking arrangements. So, payment systems are essential for the financial sector as a whole and, therefore, can be considered as a key enabler in the process of the European financial integration.

Such contribution of payment systems to the financial integration is embodied in the TARGET2 and SEPA projects. Both projects aim at the harmonisation and consolidation of the European "network" of payment infrastructures. While large-value payment systems have already attained a high level of integration and will further progress with the launch of TARGET2, retail payment systems are still very fragmented.

In the segment of large-value payment systems, the degree of integration has increased very quickly. The rationale for setting up the two European-wide payment systems that currently exist, i.e. TARGET and EURO 1, was clearly to face the challenge of the EMU. TARGET2, which is due to go live at the end of 2007, will further improve the degree of integration of wholesale payment infrastructures and will represent a major step forward in their consolidation. It will provide to its users fully harmonised settlement services and prices across Europe, supported by a single shared platform.

An important issue which is now under consideration is how TARGET2, as "backbone" of the euro market infrastructure of the euro, can best contribute to the integration and consolidation of the securities settlement systems with which it is going to interact. Should TARGET2, as announced by the Eurosystem and implemented in the system's specifications, support a wide range of interaction modes in order to foster competition between systems and let market forces select the most efficient one (i.e. the so-called no prohibition no compulsion principle)? Or should TARGET2 influence that selection process by limiting the interaction modes to only one in a long-term perspective? It goes without saying that in the latter case the Eurosystem, given its statutory responsibilities, can only select the most efficient interaction model, namely a model of settlement of cash and securities, which is in real time as it is the case in the US for instance, and which is integrated in a single platform.

In the segment of retail payment systems, the situation is quite different. Retail infrastructures are still separated by national borders and characterized by a high

degree of diversity. A number of local payment systems concentrate the clearing and settlement of all retail national transactions. In addition, the execution of cross-border payments go through several dedicated arrangements such as international card schemes, banking "clubs" or the EBA's STEP 2 system.

The SEPA project aims to put an end to such fragmentation by introducing, as from 2008, European payment instruments which are going to replace national ones by end-2010. The vision is that by end-2010 all retail payments in euro are carried out as easily, efficiently and safely across Europe as within national borders. For this vision to become a reality, a key enabler is that retail payment infrastructures become interoperable and consolidate.

The outcome of theses changes on retail payment systems is uncertain. It may lead to various structures, ranging from a natural monopoly exercised by one infrastructure that would encompass most national and cross-border payment flows, to the competition between several systems. However, whatever the structure, the challenge will be to find the right balance between two objectives:

1 Reaping economies of scale and scope and
2 Fostering competitive market conditions and behaviours.

1.2 Keeping pace with technological progress

The second issue for payment infrastructures consists in keeping pace with technological progress. Payment systems are made up of IT networks, hardware and software. As a consequence, technological progress is a key driver for enhancing the way payment systems are designed, operated and used. I will highlight a few significant examples of recent technological developments.

The first half of the nineties experienced a major transformation in the design of large-value payment systems with the widespread introduction of real-time gross settlement (RTGS) systems. In a second step, further advances in information technologies have made possible new designs like the so called "hybrid systems", i.e. systems that settle in real-time but, at the same time, minimise liquidity needs thanks to highly sophisticated optimisation mechanisms.

In short, advances in information technology allowed large-value payment systems to settle faster, with a lower amount of liquidity and at a lower cost.

On the retail payments side, technological progress should also allow safety and efficiency gains beyond those which have resulted, for instance, from the implementation of cheque truncation or those that are expected from introduction of the EMV (Europay Mastercard Visa) technology for card payments. Innovation has definitely an important role to play in in order to keep the SEPA project future-oriented and promote the use of new delivery channels for retail payments like the internet and mobile devices, or new types of services like electronic invoicing.

However, this flow of innovations come together with the entry in the payments market of new actors which do not always offer the same level of security as the traditional suppliers of those services, namely credit institutions. There is obviously a trade-off between, on the one hand, encouraging innovation by facilitating access to the payments market and, on the other hand, ensuring the safety of payments provided by setting prudential requirements on their suppliers. This challenge is at the heart of the current discussions on the "proposal for a directive on payment services in the internal market".

1.3 Ensuring business continuity

The third key issue I see is related to business continuity. Business continuity can be defined as a set of measures aimed at ensuring the continuity of service in various incident scenarios such as the failure of an infrastructure component, or the unavailability of the staff in charge of operating systems.

Business continuity has progressively emerged as a key issue to be considered for the design of payment infrastructures. In addition, several factors have recently led to overhaul our approach of operational risk : the spreading of real-time processing within payment systems, the growing complexity of technologies, the increasing interdependence between payment systems and the materialisation of risks such as terrorism or power breakdowns. All stakeholders – public authorities in charge of regulation and oversight, operators and users of infrastructures – have identified weaknesses as regards current practices. For example, incident scenarios impacting wide geographic areas have been overlooked.

In Europe, there is a broad consensus on the need to strengthen business continuity requirements. The ultimate objective is clear: business continuity should contribute to enhance the soundness of the financial system as a whole. But it is not obvious to renew business continuity procedures. Among the challenges to be taken up, I see two major ones:

1 How far to go without putting at stake the cost efficiency of the systems?
2 How to ensure the necessary coherence of the efforts undertaken by stakeholders of different importance, submitted to different types of regulations, across the different financial centres that compose the financial system of the euro?

2 What roles for the Eurosystem

The Eurosystem has been quite active in the field of payment systems and is likely to develop further its involvement under its three roles of:

1 Service provider,
2 Facilitator of market and regulatory evolution, and
3 Overseer.

2.1 Providing payment services

As a service provider, the Eurosystem has put priority on enhancing the efficiency and safety of its TARGET system, with the launch of the TARGET2 project.

TARGET2 will provide harmonised services and prices, efficient liquidity management and settlement mechanisms, while setting a new benchmark in terms of business continuity. The Eurosystems objective is to promote the use of real-time settlement services in central bank money, given their expected social benefits in terms of risk reduction in the payment process.

In the field of retail payments, the degree of the Eurosystem's central banks' operational involvement varies across countries. Most central banks provide payment services to public institutions. Some central banks also offer processing facilities to commercial banks by participating in private retail payment systems and/or operating an own retail payment system. The completion of the SEPA project calls for a specific effort of those central banks that are significantly involved in retail payment operations. They should lead by example, notably by supplying the new European payment instruments to their clients and by ensuring that the retail payment system they operate complies with the interoperability principle enshrined in the SEPA project.

2.2 Acting as a facilitator of market and regulatory evolutions

Turning to the involvement of the Eurosystem in payment systems issues as a facilitator of market and regulatory evolutions, it is fair to say that this mode of action has been mainly used in the field of retail payments to support the SEPA project.

The SEPA project was launched in 2002 by the European banking community under the aegis of the Eurosystem and the European Commission. The banking industry has taken on the responsibility of delivering the SEPA products, in particular the specifications of the new European instruments. The European Commission, which grants a great importance to the SEPA project in so far as the latter contributes to the achievement of the common market and the completion of the Lisbon agenda, has elaborated a legal framework for payment services in the European Union. It made public, in December 2005, a directive proposal that should be adopted at the European level before being transposed in national laws by 2008.

Since 1999, the Eurosystem's central banks have been actively promoting, at European and national levels, the establishment of a SEPA. They proposed a vision which is now shared by all stakeholders, contributed to a constructive review of the banking community's deliverables and cooperated with the European Commission to address legal and regulatory impediments.

While the design phase of the SEPA project is almost completed, the next challenge is to ensure that migration towards the SEPA is well-organised and delivered. Because the starting point in each country is different, migration plans to the SEPA will primarily have to be organised locally. This should naturally lead to a further involvement of the Eurosystem's central banks at national level, at least to help co-ordinating the efforts of the wide range of stakeholders.

For example, the Banque de France and the French banking federation have created a national committee dedicated to the implementation of the SEPA. This committee gathers representatives of banks, different categories of users – public administration, corporates, retail business and citizens – as well as members of the French Parliament. It is in charge of coordinating works relating to the migration towards the SEPA. Having held its first meeting in April 2006, the committee foresees to adopt the French migration plan by October.

2.3 Overseeing payment systems

As overseers, the central banks of the Eurosystem have also contributed to the objectives of European financial integration, technological progress and higher resilience of the financial system.

So far, this contribution has consisted in developing and applying an oversight framework for retail payment systems, which contributes to establish safety and efficiency guidelines for the expected integration and consolidation of retail payment systems in the context of the SEPA project.

The need that the payment systems' regulatory framework keeps pace with the structural changes underway in Europe is likely to lead the Eurosystem's central banks to develop further their involvement as overseers, at least in two directions.

The first direction is the updating of the existing oversight requirements to new market realities. Work has already started in that respect. For instance, the Eurosystem is currently revising the oversight standard for systemically important payment systems relating to operational risk. This is because discussions and initiatives in order to strengthen business continuity management have taken place mostly at national level and have not systematically considered that the financial system of the euro operates as a euro area-wide network of interrelated markets, market infrastructures and participants. Therefore, the Eurosystem is preparing a revised version of its business continuity expectations for systemically important payment systems that should be integrated soon into its oversight policy framework.

The transformation of the payment infrastructures landscape in Europe should also logically lead to an updating of the oversight framework for retail payment systems. In particular, retail payment systems are about to become interoperable and face a consolidation process, which is likely to lead to the establishment of links between systems. Such links may potentially imply a spill over of risks from one system to another. Central banks will have to make their oversight function evolve accordingly. Oversight standards will certainly have to include the links between systems, as it is already the case for securities settlement systems.

The second direction for an evolution of the oversight activities of the Eurosystem is the extension of the scope of its oversight framework to the European payment instruments currently in the making and their associated clearing and settlement systems. Investigations are currently underway to elaborate an oversight framework for card payments.

Concluding remarks

Payment systems, which are significant contributors to the broader effectiveness and stability of the financial system, are currently exposed in Europe to specific structural changes notably as a result of pressures and progress towards financial integration in the euro area.

Integration and consolidation of payment systems have made progress, while remaining in line with expectations in terms of safety. However, further progress need to be made, notably in the field of retail payment services and infrastructures. In that perspective, the Eurosystem's central banks will continue to significantly contribute to these evolutions, but I believe that market forces should be and are likely to be the primary engine for such progress.

A United States perspective on the changing pattern of payments

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Introduction

It is a great honor to be here on the occasion of the celebration of the 150th anniversary of the Bank of Spain. I thank you for the invitation and the opportunity to share my perspective on payments evolution with you today. When preparing my remarks for this session, I concluded that I could best contribute to the event by offering you my commentary – as a career academic and recently retired U.S. central banker – on some changes taking place in the payments arena of the U.S. financial services industry.

I believe you will find the changes occurring there interesting in their own right and an interesting point of comparison and contrast with what is happening in Europe. As anyone who knows the financial sector would readily admit, the origins and evolution of payments structures on our two continents could not be more different. Yet, it is my view that, while our two systems started out quite differently, they are now converging to a similar future system.

For retail payments, we are both moving toward more electronic payments processed through a growing number of somewhat distinct but converging vehicles. On the U.S. side, the pattern of payments is indeed evolving – some might say it is experiencing a radical change. America's paper-based payments system is giving way to a new realm of electronic payments vehicles – a transition that has already occurred in Europe.

For wholesale payments, change has been most apparent in the globalization of large dollar-based payments and the continued rapid increase in transactions across both borders and currencies. This volume acceleration and accompanying institutional changes have been palpable forces of change in the international payments arena. As a result, I believe we are beginning to see signs that our two systems are starting to converge here too.

Traditionally, when compared to Continental Europe, there has been considerable diversity in the forms of retail payments used in the U.S. The U.S. wholesale structure, however, has been relatively simple and fairly stable. Now, wholesale and retail payments structures are evolving rapidly. To be sure, their evolution is affected by our distinct financial history and shaped by our legacy systems, but changes are in fact occurring in the U.S. market.

The rapid evolution of U.S. payments systems presents our central bank with many challenges. This is because, unlike most central banks in Europe, the Federal Reserve is a primary service provider as well as a regulator. Therefore, in this world of changing payments the challenges facing the U.S. central bank may be greater than those facing its counterparts across the European Union.

The Federal Reserve has been a vital part of the retail payments system since our founding over 90 years ago. From its inception, the Federal Reserve has had a dual role as the central bank charged with ensuring the integrity of the payments system and as a participant in its evolution. As a result, the changes in the U.S. payments system are affecting not just the industry that the Fed supervises but also its own operations. Over time, the Fed's role in payments will change and is likely to converge to one more similar to the one presently occupied by European central banks. The Fed's role in paper processing will diminish over time as checks recede in both absolute volume and relative importance in our retail payments system, and our large dollar payments system is likely to evolve into one that operates more like the ones employed in Continental Europe. As this occurs, it will further increase the Fed's resemblance to the central banks of Europe.

I am quite certain that, over time, both the Fed and European central banks will concentrate more of their efforts on their provision of large value gross settlement services. Here, the U.S. has already changed quite a bit, and the same is true for continental Europe. However, we have had different reasons for the changes we have seen thus far in our central banks. For the U.S., our geography and the needs of commerce have led to significant increases in volumes as well as increasing concentration of clearing and settlement activities in the few major banks that participate in all of our key clearing systems. These changes, in turn, have raised concerns over daylight credit risk and the impact of increased concentration on the operations of our wholesale payments structure. For the EuroZone, the changed currency environment offered you a chance to institute a new, more efficient wholesale payment structure, which you are embracing under the title of TARGET 2. Despite their different starting points, I can see TARGET 2 evolving into a counterpart of Fedwire even as Fedwire adopts some of the features of TARGET 2.

With that prologue, I would like first to share my thoughts on retail payments issues, namely, the current status of the U.S. retail payments infrastructure as compared to Europe's, how the roots and evolution of the U.S. payment system differ from your own, as well as the likely future path of the U.S. payment system and

the Fed's role in it. I will next offer some thoughts on wholesale payments and trends there as well. In each case I will spotlight the forces of change and how they are leading to convergence and integration of our two systems.

The current state of retail payments technology in the U.S.

Historically, Americans and Europeans have long relied on an entirely different mix of retail payments vehicles. For example, Europeans use cash roughly twice as much as Americans.

However, looking at our noncash transactions gives evidence of where our differences truly lie. When I last looked at the data, more than half of all noncash retail payments in Europe are made through a Giro system and only about 15 percent are made by check. By contrast, it is almost exactly the reverse in the United States; half of all U.S. noncash retail payments are made by paper check and less than 10 percent are made through our ACH, which is the American version of a Giro system.

The dominance of the Giro in Europe and of the check in the United States are long-standing features of our respective payment systems. The history of how this dominance evolved is interesting and instructive, as I will elaborate in just a minute.

Payment cards account for the remainder of retail payments. Here, there are similarities and differences between Europe and the United States. The similarities are in our use of debit cards. Debit cards, a relatively recent innovation, have caught on quickly both Europe and the U.S., now accounting for about a quarter of noncash retail payments in both places. The differences are in our use of credit cards. Credit cards have long been an important payment vehicle in the U.S. and at present account for about a quarter of noncash retail payments. In Europe, credit cards are used less frequently – in about 10 percent of transactions, though I would note that Europeans' use of credit cards has picked up in recent years.

The long-standing success of the credit card in the U.S., and the rapid rise of the debit card in both Europe and the U.S. are also interesting and instructive stories, which I will touch on as well. But first, let me expand on our distinct histories in the differential use of the Giro and the check.

The European structure

To understand the dominance of the Giro in Europe and the check in the U.S. we have to go back about 100 years to the late 19th and early 20th century. At that time, European banks did not provide routine payment services. They served primarily as merchant banks and as private banks for wealthy individuals.

In the late 1800s, local post offices began establishing postal Giro systems as a convenient way for common people to deposit savings; later, these systems evolved to allow depositors to remit and receive payments. The system was successful in that it allowed every post office savings account holder to make and receive payments both locally and nationally. This revolutionary achievement rendered non-cash payment transactions accessible to large sectors of the population. Later, in the 1950s and 1960s, European banks sought to broaden their business lines to encompass the mass market as a way to expand their deposit base to fund loans. This meant providing routine payments services to customers, and so bank Giro systems were created to handle the volume.

This evolution occurred relatively smoothly and rapidly as a result of Europe's concentrated banking industry – a few banks operating nationwide, cooperating closely with each other.

At the same time, European governments wanted to establish payment systems that minimized costs and maximized access. When technology made it economical to replace paper Giros with electronic Giros, European governments pushed for the transition. The concentration of the payments system in the hands of the postal service and a few national banks made it relatively easy to accomplish. Because of its Giro system, Europe had, or could easily set up, centralized accounts for credit transfers. In short, European central banks encouraged – and in some cases, mandated – the use of electronic Giro systems.

The U.S. structure

In contrast, the U.S. payments system evolved quite differently from Europe's. Historically, U.S. banks tended to provide services – including payments services – to the broad spectrum of people and businesses. On the loan side, commercial banks focused on commercial and industrial lending, but they took deposit balances from all economic strata.

In early America, the geographical expanse of the country and the relatively weak federal government encouraged a fragmented banking system. Entry into the banking business was relatively easy, but bank branching was very restricted. Banks were prohibited from branching outside their home state, and in many states, branching was restricted still further. As a consequence, a region would be served by a relatively large number of banks, but there were no banks operating nationwide. For many years, banks issued their own banknotes. To effect transactions, people paid one another with paper checks drawn on their bank or paper currency notes issued by their bank. The banks would then clear these checks and notes among themselves.

With many small banks spread out across such a big country and with banks clearing paper instruments among themselves, effecting transactions outside the

local area was cumbersome. This was a payment system inimical to the growth of national commerce.

By the turn of the 20th century, it was clear that the U.S. needed a more well-integrated national payment system. Indeed, one of the main reasons Congress established the Federal Reserve System back in 1913 was to create a national clearing system in which checks could exchange at par value even among geographically distant banks. To achieve this goal, the Federal Reserve offered check clearing services free of charge to banks that joined the Fed System. The Federal Reserve also provided a national paper currency.

However, the Fed did not become the sole provider of check clearing services, despite offering its services for free. Especially in large urban areas, banks found it preferable to continue clearing checks directly. Nonetheless, the Fed established a large market presence, providing a baseline level of national check clearing services accessible to all banks, large and small, anywhere in the country. Thus, the Fed contributed to the viability of both the paper check and the small community bank.

In the 1960s and 1970s, U.S. banks and the Fed applied advances in computing technology to check processing, increasing the efficiency of their operations. Banks found the paper check payments business to be profitable, and consumers were quite comfortable and confident in the use of checks.

In short, checks were the dominant form of noncash payment, and there was little momentum for change in the U.S. payments system. One might argue that bank Giro systems, which were arising in Europe at the time, would have increased the efficiency of the payments system even more. Yet with so many banks in the U.S. – all serving local markets – developing the legal framework, industry standards, and institutional arrangements necessary to establish such a payments network nationally would have been a daunting task. And in any case, American banks are forbidden under antitrust law to work together. Therefore the Fed was, almost out of necessity, a prime mover in the payments system of the U.S.

In the early 1970s, the Federal Reserve itself introduced the first U.S. version of an electronic Giro system, known as the Automated Clearing House, or Fed ACH. Fed ACH has met with some success. However, unlike the European Giro, ACH did not and has not developed into the dominant form of electronic payment. In part this is because for many years only banks – not individuals – could initiate ACH payments. Therefore, banks initiated ACH payments for companies engaged in batch-processing a large number of payments, such as payroll disbursement, but the cost of initiating and processing ACH payments was too high to make originating single payments for individuals worthwhile. However as costs have declined, banks have expanded ACH services to enable large organizations to collect regular payments from individuals using the ACH. A typical transaction of this nature would involve individual customers' authorizing their bank

to make payments from their accounts directly to a firm on a recurring basis. The individuals no longer write checks to pay those bills; instead, their banks initiate the ACH transactions. ACH is now also being used to process one-time payments initiated via the Internet. The result has been a rather rapid increase in volumes within an environment where the resultant ACH is almost invisible to both the retail customer and the corporate client of cash management services.

Going forward, the speed of the transition to electronic bill paying will depend, in part, on the evolution of our payments system. Financial institutions are finding innovative new uses for ACH, spanning a broad range of retail transactions and shifting substantial volumes to this system, primarily at the expense of check volume. While our ACH has not been as successful as your Giro systems, this transaction vehicle continues to gain market share. The most important of these innovations is known by the acronym ARC for Automated Check Conversion. ARC is helping to streamline payments initiated by check by converting these payments to ACH transactions, even when the paper check would follow. Moreover, as ACH continues to gain acceptance as a payment vehicle, its products and marketing will evolve making it more attractive and accessible to individuals and businesses.

Cards drive changes in U.S. payments

While Fed ACH saw some success as a means to effect electronic payments, it was the credit card that proved most instrumental in moving U.S. payments from paper to electronics. The credit card actually was the first electronic payments instrument to emerge in the U.S. Credit cards were introduced in the 1950s, and their use grew rapidly over the next three decades.

Credit cards

Not coincidently, the U.S. credit card infrastructure looks a lot like the European banking system. There are relatively few major card associations. They operate nationwide. And they are not subject to the anti-trust laws that prohibited collaboration among U.S. banks. In fact, the credit card associations benefited from some early antitrust rulings against banks.

In the 1990s, when the tech boom made information processing and telecommunications more powerful and less expensive, the credit card associations were well-positioned to take full advantage of these developments. Low-cost telecom has made real-time, point-of-service verification of cardholders and their credit status widespread, speeding transactions and curtailing fraud. Of significance for the future, this technology also has made the credit card a viable means of payment for e-commerce.

Debit cards

After the credit card, the debit card is the second most popular electronic instrument for making retail payments in the U.S. today. The debit card arrived on the scene relatively recently – during the 1980s – in both the United States and Europe. But since its arrival, growth in usage has been dramatic – much faster than growth in credit card payments.

In Europe, the debit card emerged as an evolution of banks' automated teller machine (ATM) systems. Instead of using their card to withdraw cash from an ATM to pay merchants, bank customers simply present their card to the merchants and their bank account is debited directly.

This same progression occurred in the U.S., too. But in the U.S., the credit card networks responded with debit card products of their own. Visa and MasterCard already had an infrastructure in place for processing credit card transactions at the point of sale. They leveraged this infrastructure to establish offline debit card networks. Indeed, in the U.S., these so-called "signature" debit cards are proving at least as popular as ATM, or "PIN-based," debit cards.

Signature debit cards now account for about two thirds of the total of debit transactions in the U.S., so it could be said that they are even more popular than their PIN counterparts. However, PIN-based debits are growing a bit faster than signature. In any case, debit cards in general seem to be leading the migration away from cash and checks and toward electronic payments in the U.S.

This trend is substantiated by the Survey of Consumer Finances, sponsored by the Federal Reserve Board of Governors. The survey indicates that fewer than 18 percent of households used debit cards in 1995. By the new millennium, nearly half of all households were using them. Not coincidentally, the survey also documented a substantial reduction in the use of cash.

The growing popularity of debit cards in the U.S. seems to be part of a broader phenomenon. As I mentioned earlier, debit cards have caught on just as quickly in Europe. In fact, for the first time ever, Visa's global debit sales volume surpassed its credit sales volume in 2004.

The future of the U.S. retail payments system

Looking ahead, retail payments in the U.S. will continue moving away from cash and paper checks toward electronic instruments, including credit cards, debit cards, ACH, and emerging vehicles such as prepaid cards. Though roughly half of our noncash payments are still being made by paper check, the tide has turned. In fact, recent research by the Federal Reserve shows check usage peaked in the mid-1990s and has been declining steadily ever since. So paper checks are

not only losing market share, they are actually declining in volume and have been for about a decade. Therefore, it is easy to predict that the share of retail transactions handled by cards will continue to grow in the U.S., particularly at the point of sale.

More recently, the leading debit card issuers have been working hard to make inroads in the realm of "micropayments" – purchases under $20. According to a survey by MasterCard International, debit cards now account for about 1/3 of all micropayments, a 61 percent increase over 2001. Here, debit transactions are replacing cash with the survey indicating a substantial drop in cash micropayments.

As cards are supplanting checks and cash, the players in the payments business are changing. Organizations other than banks, especially retailers themselves, are now playing an expanded role in the payments system. As a result of recent legal action brought by WalMart against U.S. card companies, retailers now appreciate the costs and benefits associated with alternative payment processing arrangements and are weighing in to protect their interests.

As you may know, WalMart, the largest retailer in the U.S., along with other merchants, balked at the idea of accepting signature debit cards – and their associated fees, which are higher than fees for PIN-based cards – without the right to negotiate. They sued U.S. bank credit card associations, prevailing in a good portion of their efforts. Their settlement eliminated the "honor all cards" rule, effectively allowing merchants to decline signature debit products without jeopardizing their ability to accept credit products or PIN debit cards.

The resulting keen competition among card providers, and aggressive marketing by both card providers and merchants, are increasing the speed with which cards replace paper for point-of-sale transactions in the U.S. How rapidly U.S. consumers will continue their move from paper to electronic transactions is an interesting question. The speed is uncertain but the direction is not in doubt.

Managing the transition

So, the private sector is shifting retail payments in the U.S. away from paper-based instruments and toward electronic ones. But history tells us that people's payment habits change only gradually. When people are comfortable with and confident in a payment structure, they are reluctant to give it up. As a result, the paper check is likely to be with us for some time.

In the meantime, the Fed has been trying to take full advantage of the efficiencies afforded by electronic processing of payments initiated by paper check in the interest of maximizing the efficiency of the payment system. Thus, the Fed is doing what it can to foster check truncation and electronification as early as possible in the payment process.

The Fed is now well positioned to pursue this objective. Two pieces of legislation have set the stage. One is a law that has been on the books for nearly 25 years now: the Monetary Control Act of 1980. The second was passed just two years ago: The Check Clearing for the 21st Century Act, commonly called Check 21. Let me explain the significance of each.

Recall that when the Fed began its check processing operations in 1914, it provided the service at no charge, but only to its member banks. The Monetary Control Act of 1980 changed all that. It required the Fed to offer its payments services to all banks at prices fully reflecting the Fed's costs of production plus a mark-up equal to profit margins earned by the Fed's private-sector competitors. This change established a marketplace incentive for the Fed and its private-sector competitors in check processing to maximize the efficiency of their check processing operations.

The second piece of legislation, Check 21, adds an important new dimension to the competitive drive for greater efficiency in check processing. The essence of the new law is that it makes the facsimile of a check created from an electronic image serve as the legal equivalent of the check itself. In doing so, it eliminates a significant legal barrier to check truncation and electronification of check processing. A collecting bank can now create an electronic image of a check, transmit it to a location near the paying bank, and then present the paying bank with a paper reproduction or with the electronic image. The hope and expectation is that over time paying banks will prefer to receive the electronic image. Accepting images for both deposit and presentment eliminates back office capture of the check as well as the inconvenience of physical transportation.

As a provider of financial services, the Fed has been actively engaged in bringing a whole array of image products to market to take advantage of the capability of image clearing. The Fed has established an image archive for electronic items; it has enhanced their ability to produce facsimile checks; and it has extended clearing times to encourage the use of the image technology that the act allows. In short, the Fed is introducing new services that will enable banks to take full advantage of Check 21.

How fast will the transition occur? The industry has been slow to embrace the new capabilities that the law permits, but recently volumes have begun to increase rapidly. This rapid growth has caused some serious strains on the Fed infrastructure. With the evolution of the payments system in the U.S. accelerating, the Federal Reserve has had to make major adjustments to its payments infrastructure.

The Fed has been working to cut costs and improve the reliability and efficiency of the current generation of payments vehicles, even as it works to foster innovation and to support the next generation of payments vehicles. The Fed has begun implementing a strategy that includes key elements to help us successfully

meet both commitments. The Fed recently announced a program of "aggressive electronification" of retail payments in the U.S. This push toward electronics will help facilitate Check 21 and quicken the transition to an all-electronic world. The Fed also has been investing heavily in technologies that enable electronification. The resulting decline in paper check volumes has placed strong pressure on the Fed to find new processing efficiencies and reduce both fixed and variable costs. As a result, the Fed has embarked upon a downsizing strategy that includes the consolidation of operations and closing of processing sites where appropriate. As the Fed has downsized its check clearing operations, it has attempted to maintain reasonable service levels nationally by re-routing checks to processing sites near those that are closed.

To give you a sense of the scale and speed of this effort, I will note that when I joined the Fed in 2000, it had 45 check processing sites. By the end of this year they will be down to 22. In fact, by year's end the New York Fed's main check clearing facility will close and be folded into Philadelphia's facility. This is a sign of the times.

Such a radical transformation within the Fed's financial services division is made necessary by law. As I mentioned earlier, the Monetary Control Act mandates that the Fed set prices on services to fully recover costs. At the same time, the law requires the Fed to adjust its portfolio of clearing and payment services to correspond to the needs of the economy and banking industry. As a result of these requirements, the aggregate decline in volume in this volume-based service creates a substantial challenge to the System. And achieving full cost recovery will become more challenging as the volume of check usage continues to decline.

Nonetheless, by setting prices that reflect the low cost of electronic check processing relative to paper, the Fed will allow, indeed encourage, the market to drive checks toward electronics. In addition, the Fed will continue to develop its capabilities and expand its electronics capacity to respond to the market's evolution and consumers' needs. The impact of these changes and those that follow will ultimately transform the U.S. payments system and enable a complete restructuring of the U.S. retail payments system.

Turning to wholesale payments

But enough about retail payments. Let me turn next to wholesale payments in the U.S. In addition to its role of supporting retail payments and small-dollar transactions systems, the Fed has long had a role in facilitating wholesale or large dollar transactions. As most of you know, Fedwire is the Fed's wholesale, real-time, gross payments operation. It is used to transfer both funds and securities.

Fedwire transactions typically involve large-value, time-critical payments, such as payments for the settlement of interbank purchases and sales of federal funds, and

securities or real estate transactions. To give some indication of scale, currently Fedwire processes approximately 500,000 payments per day, totaling nearly $2 trillion.

Fedwire has a long and rich history. It first went into operation back in 1918, just four years after the Federal Reserve System was established. At the time, it used leased wires and relied on Morse code. Over the years its operations have evolved with advances in technology and the integration of financial markets. From the telex, to dedicated computer systems, to the emergence of the Internet, the evolution of technology has put pressure on our central bank to evolve its wholesale clearing system to the needs of commerce in America.

In the U.S., the pressures for change in wholesale payments occurred in an environment that made change somewhat easier than in other parts of the world. The U.S. has had one currency for more than 200 years, and the twelve independent Reserve Banks have increasingly operated as a single system offering national products. Moreover, designing and implementing uniform operating policies at a national level to respond to the demands of the financial sector has been easier to accomplish in wholesale payments than was the case for retail payments. Geography is irrelevant for Fedwire payments but crucial for retail payments, as I have already noted.

It is my impression that European wholesale payments systems recently have been evolving toward a wholesale payments model that is not dissimilar to the Fedwire system found in the U.S. I presume that this is at least in part because of the emergence of the Euro. If the US is any guide, your system, TARGET 2, will likely consolidate European central banks' wire transfer operations much as Fedwire has done in the U.S. This standardization of the processing platform will likely reduce costs through economies of scale and improve flexibility of wholesale payments.

However, Fedwire is not alone in providing interbank clearing services to the U.S. financial system. We have a number of other networks that facilitate transactions between our banks and their customers, including credit card networks and, of course, the payments activity of the Clearing House Interbank Payments System (CHIPS). Importantly, the Fed's National Settlement Service allows participating clearing and settlement systems to settle transactions among their members on a net basis via Fedwire. At last report, the US has approximately seventy such systems functioning in this manner. Of this group, the most important and most relevant is CHIPS; so, let me make a few comments about it and how it has been affecting the Fed.

Payments platforms on our two continents have long been bound by the international wholesale payments system, CHIPS. Yet, changes and advances in CHIPS have affected us perhaps more so than Europe, due to CHIPS dollar-based settlement process and its reliance on Fedwire for net settlement among CHIPS participants. As a result, I would speculate that the lack of finality, a hall-

mark of the CHIPS system of yesteryear, occupied, indeed worried our central bank more than others. But, with CHIPS now providing clearing finality, there is a meaningful private-sector linkage between the U.S. and European currency areas and between the wholesale clearing systems of the developed world.

The more recent addition of the Continuous Linked Settlement structure, known by its acronym, CLS, has only added to our interconnections. This foreign exchange clearing system, although still handling a modest volume of the world's foreign exchange trades, has proved to be another beneficial structure that has reduced intraday exposure and added needed liquidity to wholesale payments.

This liquidity is indeed needed. In the US, wholesale dollar based transactions volume has increased steadily and dramatically over the past twenty or thirty years. And, during this same time our banking industry has been consolidating, resulting in the volume of transactions at our largest institutions rising even more rapidly. Data from 2000, which is almost ancient history now, tell this story. The top 50 banks accounted for 80 percent of value across the system. The concentration is even greater today.

The result is that the volume of wholesale payments processed by Reserve Banks has been rising at the same time the payments flows have become more concentrated. This trend was first recognized in the 1970s and 1980s; it led the Fed to take steps to address the growing settlement risk generated by the combination of rapidly rising volumes and increasing concentration.

As a matter of practice, any institution that maintains an account at the Fed is allowed to be a Fedwire participant. And in a similar manner, intraday central bank credit, in the form of daylight overdrafts, is generally available to all Fedwire participants in sound financial condition. Overall, aggregate average daylight overdrafts averaged about $30 billion per day since 2000, with peak aggregate daylight overdrafts averaging $90 billion each day. In 2000, 10 institutions accounted for nearly 75 percent of total average overdrafts.

Working with the industry, the Federal Reserve has addressed the daylight overdraft issue through the systematic development of caps and self-regulation. The result of this effort was a slowing of the growth of daylight average overdrafts even as volumes continued to climb.

Interestingly, the Fed's emphasis has been on limiting daylight overdrafts through self-policing, and internal payments queuing. The Fed's rules require all institutions incurring intraday overdrafts to establish a daily limit ("net debit cap") equal to a multiple of the institution's risk-based capital. As you might expect, non-zero net debit caps are granted at the discretion of the Federal Reserve Banks and are subject to review by the Board as part of its overall oversight of payment system risk.

This contrasts with the approach taken in Europe, where banks either are not allowed to incur overdrafts in their accounts at their national central bank, or are re-

quired to fully collateralize them. In the U.S., the focus has not been on driving daylight overdrafts to zero, or to collateralizing them as a way to reduce payments risk. In fact it was not until 2001 that banks were allowed to obtain additional daylight credit, that is to say, an amount beyond their net debit caps, by pledging collateral. Collateral has never been a mainstay of Federal Reserve payments risk policy.

As a result, large institutions have responded to this regulatory framework by managing the timing of payments within the day to best live within the daily cap at their local Federal Reserve Bank. One effect of this queuing is that payments are increasingly becoming bunched at the beginning and end of the day. This has led some to express concern about the potential of "gridlock" in the payments system at certain times of the day, or when a large bank suffers computer problems and is unable to originate payments. Fortunately, such events are rare. In the past, when they have occurred, the Fed has extended Fedwire's closing time and supplied additional liquidity to prevent shocks or technical difficulties from spreading and causing large disruptions in the payments system. But the system is not as robust as it might be.

As I noted earlier, the American approach of relying on central bank intraday credit is quite different than the path the Europeans have followed. European central banks have relied on collateral and virtually eliminated unsecured daylight overdrafts.

While the U.S. has been slow to embrace this approach, its time may be near. Collateral already exists in the international systems that I referred to above. With the DTC same-day credit facility a reality and continuous time pricing of credit becoming more common in the global financial markets, my view is that it is just a matter of time before the US wholesale payments system relies more heavily on collateral as a source of liquidity. When that happens, the wholesale payments system in the U.S. will likely evolve to one that more closely resembles TARGET2 in structure.

In wholesale as in retail payments, we are seeing systems that were founded quite differently now evolving to a common approach. In short, here too we are seeing some convergence.

Conclusion

By way of summary, let me indicate that my discussion today had several goals. First among them was to review and explain the state of the payments structure in the U.S. to colleagues who come from a different tradition and institutional structure. There is a reason for most things, and the roots of our different payment systems are found in our different banking structure and different perceptions of appropriate regulation.

Yours is a system of few large banks that can easily be regulated into a centralized world – first with near-universal Giro accounts and soon with an electronic world of more centralized clearing. In the U.S., markets and consumers led us to a multiplicity of banks and a retail payments system that has been paper intensive.

My second goal was to explain how the U.S. retail payments structure is changing, as cards are replacing checks, and electronic clearing is truncating the maze of paper that fills our post offices. Our progress, while promising, occurs largely in fits and starts in response to market forces, reflecting the fact that the U.S. is a large nation with many providers, much complexity, and a philosophy of market-based solutions. Nonetheless, it seems the U.S. retail payments system is moving toward convergence with the European model.

The rapid transition from checks to electronic payments has presented challenges for the Federal Reserve as a provider of financial services. It has necessitated restructurings, plant closings, and difficult decisions that most central banks in Europe have been spared.

On the wholesale level, change has been less dramatic. Fedwire continues to be a resilient and dependable payments mechanism, as it has been since its emergence nearly ninety years ago. Fedwire continues to be a critical locus of net settlement services for the myriad of networks from CHIPS to credit card systems that have come to depend on its integrity and reliability. Yet, here too, change is occurring, and is likely to continue.

My third goal was to indicate that the likely outcome will be, I believe, a system not dissimilar to the one that the EuroZone is building for your new currency and integrated clearing system.

In conclusion, I want to note that the process of change will never subside. In both the retail and wholesale arenas, as payments technology moves forward, our payments system will continue to change as evolutionary forces generate new innovations in payments and new ways to deliver them. As we go down this path, however, I believe that in some important ways we in the U.S. will be operating with a payment system that looks more like the European system than ever before. We will look more alike, although we will get there from a very different starting point.

Central Banks and Global Imbalances

Central banks and global imbalances

José Manuel González-Páramo
European Central Bank

It is a great pleasure for me to open this round table on "Central Banks and Global Imbalances" at the invitation of the Banco de España. I would like first to thank the organisers for giving me the opportunity to speak in front of such a distinguished audience.

The issue of global imbalances is indeed high on the agenda of every international economic policy and academic meeting. The facts are well known. In 2005 the current account deficit of the United States was estimated to have reached 6.4% of GDP, a level roughly matched by the combined current account surpluses of Japan, China, other Asian economies and the oil-producing nations. It is this diverging pattern that is generally referred to as the "global imbalances".

These facts are recognised, but that's as far as it goes. There is no consensus on the other elements surrounding the discussion on global imbalances. In particular, the factors behind the imbalances, their sustainability and the risk of disruptive adjustments are being closely examined by both academics and policy-makers, and frequently their conclusions diverge. Indeed, our panellists today hold contrasting views. Professor Axel Weber in a recent speech observed: "With regard to measures to reduce the current global imbalances the most urgent policy steps have to be taken by the US authorities". David Folkerts-Landau and his co-authors suggest, however, the possibility that no landing is necessary, that the current global imbalances reflect a conscious and stable arrangement between surplus and deficit countries, the so-called New Bretton Woods (NBW) system.

To start off the panel discussion, I will base my remarks on four questions that get to the heart of the issue. The four questions are: What are the factors behind global imbalances? Are global imbalances sustainable? Is there a need for policy adjustment? And, what role could central banks eventually play in the resolution of global imbalances?

1 What are the factors behind global imbalances?

Declining savings in the United States

A natural place to start to answer this question is obviously the US, where the increasing current account deficits seem to be due to a combination of factors. While rising investment was the driving force of this increase in the 1990s, falling savings have become the main contributor to the deficit since the early years of this decade. Indeed, the US national net saving rate is currently at around 1% of GDP, the lowest level since World War II. Both private and public savings seem to have contributed to this decrease.

As regards private saving, its decline has been mainly due to a drop in net household savings that in the course of 2005 – for the first time since the 1930s – fell into negative territory. Declining household saving could be the result of different factors, among which the economic literature has emphasised the role played by, first, the higher levels of productivity growth in the United States compared with its trading partners, implying larger returns on investment. Second, there is also some evidence that the lower US interest rates may have contributed to the decline in private savings, although in this case it is in practice difficult to identify the precise pattern of causality. Third, and related to this latter point, substantial positive wealth effects – triggered by the asset price bubble in the second half of the 1990s and soaring real estate prices since 2000 – may have helped to push down the low private savings rate in recent years. Finally, population ageing and distortionary tax incentives could have also played a role.

Turning to public savings, it is indeed a fact that the US general government fiscal balance swung from a surplus of more than 1% of GDP in 2000 to a deficit of around 4% of GDP in 2005. There is, however, an intense debate, ranging from academia to policy-making circles, on the extent to which a fiscal deficit translates into the current account. The consensus view is that there is a significant, albeit partial, statistical relationship between fiscal balances and current account positions, confirming partial Ricardian behaviour by the private sector. The aforementioned view implies that the US fiscal position matters as far as the current account deficit is concerned.

Saving glut: Asia and the role of oil exporters

Falling net saving in the US must have a counterpart somewhere in the world in the form of higher net saving rates. This high saving rate was referred to as a "saving glut" by Ben Bernanke (2005) and originates mostly from Asian countries and oil exporters. To better understand the determinants behind this behaviour, it is necessary to look at the different regions separately.

Starting with East Asian countries, excluding China, saving rates continue to be high in this region, but the switch into higher current account surpluses from the late 1990s onwards can be explained by a drop in investment around the time of the Asian crisis. In this case, it is therefore more accurate to speak of an "investment drought" rather than a "saving glut".

In China, by contrast, the high and increasing current account surplus cannot be explained by a fall in investment – investment is in fact remarkably robust, accounting for more than 45% of GDP – but by a very significant rise in national saving, which now amounts to more than 50% of GDP. The high level of household saving seems to be mainly due to adverse demographic developments (the ageing of the population), the lack of a social safety net and limited access to financial markets that do not allow savings to be channelled to productive investment.

An additional important factor influencing the current account surplus of Asian economies concerns exchange rate policies. The policy followed by some of these countries of fixing the exchange rate at very competitive levels has favoured the widening of trade surpluses in these countries and deficits elsewhere, but it has also forced Asian central banks to intervene to stabilise the undervalued exchange rates, leading to a massive accumulation of international reserves, with much of these reserves being invested in US dollar-denominated assets. Through these interventions, Asian countries have enabled the United States to finance a large and increasing current account deficit at relatively low interest rates.

Finally, let me refer to oil exporters. They constitute a group of countries where net saving is also high by historical standards. In their case, saving rates have increased following the higher oil income revenues since the late 1990s. Faced with this positive terms-of-trade shock, oil exporters have opted for a rise in saving and invested abroad; domestic investment has not reacted so far.

Related to this latter issue, I should add that in fact the rising oil bill has become an additional hurdle to the adjustment of the US current account deficit, partially explaining its worsening over the past few years: the oil bill (net imports) of the United States rose from 0.7% of GDP per year from the mid-1980s until the end of the 1990s, to 1.8% of GDP or around one-quarter of the US trade deficit in 2005.

Home bias

Let me finally refer to an additional factor that has been cited as contributing to the widening of the US current account deficit: the decline in home bias. By definition, rising current account deficits in a given country are possible if, and only if, foreign residents are willing to increase the value of the assets they have invested in that country. What prompts them to do so? One would think that return differentials are the main driving force but, as the recent experience of the

US shows, other factors play a role. In particular, the notion of home bias is a key element in explaining cross-border investments.

The concept of home bias refers to the fact that investors worldwide seem to be excessively investing in their home country. To quote Alan Greenspan (2005): "Home bias implies that lower risk compensation is required for geographically proximate investment opportunities". In an attempt to measure this phenomenon, one could say that having no home bias would imply that a country holds the same proportion of its financial assets abroad as the rest of the world market capitalisation is in the world.

Ongoing empirical research at the ECB indeed shows a significant decline in home bias for equity and bond financial flows in the mature economies since the late 1990s, which would help to explain why the US has found it particularly easy to fund its rising current account deficit. The fall in home bias was larger for euro area economies than for the US, and the level of home bias is lower in euro area countries (now around 65%) than in the US (above 70% for equities and above 90% for bonds). An important final point to be stressed is that the level of home bias is still very high in emerging countries, and therefore leaves scope for a future decline if one assumes convergence across countries.

Having finished this quick overview of some of the key factors behind global imbalances, I'll turn to the second question:

2 Are global imbalances sustainable?

This is of course not a trivial question. After all, we haven't yet seen any signs of an incoming disorderly adjustment of the imbalances and, as I mentioned earlier, there are some analysts who say that the current path can actually be sustained for a fairly protracted period of time.

This being said, there seems to be a broad consensus that the present constellation of current account positions cannot be maintained indefinitely. The US current account has led to a steady deterioration of the net US international investment position.

Back in 1980, the United States was a net creditor to the rest of the world to the tune of USD 360 billion, whereas at the end of 2004 it owed foreigners USD 2.5 trillion or around 22% of GDP. Between 2002 and 2004, this latter ratio remained stable in spite of large current account deficits, mainly because of large valuation gains, which were prompted by the depreciation of the US dollar, which in turn boosted the dollar value of foreign currency-denominated assets. However, it is unlikely that a permanent net debt devaluation strategy is sustainable, since it is reasonable to expect that international investors would end up asking for higher interest rates on US debt.

The previous dynamics point, in my view, to a need for a lower current account deficit in the United States. Let me illustrate this with the results from a simple arithmetic calculation. If the current account deficit of the United States continues to run at around 6% of GDP and nominal GDP grows at 5.5% a year – which is more or less the long-term consensus forecast for growth in the US – the ratio of US net foreign debt to GDP would increase to above 100% in the long run (if one excludes possible valuation effects).

In this context, the ability of the US economy to attract sufficiently large financial flows becomes crucial for the sustainability of the external deficit. Until 2000 the US current account deficit was financed by inflows into the domestic productive sector, taking the form of equity or direct investment. Recently, investors seem to have reassessed the longer-term profitability of US firms relative to earlier expectations and, as a result, net equity and foreign direct investment in the US have dried up and even gone into reverse, being replaced by large net inflows into the US bond market. In the last two years, virtually all of the net foreign inflows into the US have been debt-creating. The accumulation of foreign exchange reserves by Asian central banks and other reserve accumulators such as Russia, which mainly buy US government securities, have played an important role in shaping this trend.

From a flow perspective, the growing stock of debt interacts with the current account dynamics. In fact, the US is expected to face higher costs for servicing its rising debt. Over the past twenty years, the US income balance has consistently recorded surpluses ranging between 0.1% and 0.5% of GDP, although in 2005 this surplus shrank to a mere USD 1 billion (preliminary estimate), on the back of rising debt service obligations. Looking ahead, the income balance could turn negative as US interest rates continue to rise. A growing negative investment income would in turn imply a smaller sustainable trade deficit over the long run and complicate the current account adjustment.

Therefore, the relevant question is not whether, but when and how, the adjustment will take place, and this leads us to my third question:

3 Is there a need for policy adjustment?

At least two different arguments can be used to give a positive answer to this question. First, as indicated previously, several policies seem to underlie, at least partially, the existence of global imbalances. Second, even if policy is not the cause of imbalances, there is a great risk that a purely market-determined adjustment may be abrupt, with serious adverse effects on global economic growth and financial stability. Thus, policy may have an important role to play in preventing the market from overshooting, or should at least smooth the adjustment process and ensure that it does not disrupt the global economy.

In my own view, the most likely scenario will be one of a gradual and orderly adjustment of these imbalances over the medium term. Yet, I should add that such a "benign" scenario requires policy-corrective action to be taken, and I would like to quote President Kennedy's sound advice to policy-makers worldwide: "The best time to fix the roof is when the sun is shining".

The orderly unwinding of global imbalances requires global policy efforts, meaning that all major economies will have to make domestic adjustments. This is the bottom line of the G7 approach to the adjustment of global imbalances. In the *United States,* savings should increase – both through further fiscal consolidation and through an increase in private savings, which could be achieved through reforms of the US tax system, the elimination of distortionary tax incentives, and a shift towards higher energy efficiency. *Emerging Asian countries* are also expected to play a role in contributing to a smooth resolution of the global imbalances. Exchange rate flexibility is an essential element to ensure that necessary adjustments take place, together with reforms aiming at improving and deepening the financial sector. This would facilitate the resolution of both internal and external imbalances – insofar as high savings rates stem from low rates of return on financial assets. *Oil producers* could also contribute by fostering higher domestic investment – in particular, investment to enhance their oil extraction and refining capacities, to develop their infrastructures and to diversify their domestic production capacities away from oil. Finally, I will of course not forget the *euro area.* Our external position, with a roughly balanced current account, is very much in line with the structure of our economy and is consistent with demographic developments in the euro area, which require net savings over the longer term. Thus, the best contribution that the euro area can make towards resolving the global imbalances should come from further structural reforms aimed at increasing our growth potential. A similar line of argumentation to that of the euro area applies to Japan.

4 What role can central banks play in the resolution of global imbalances?

Let me now tackle the last part of my presentation, returning to the general issue raised by the organisers, on the link between global imbalances and central banks. I would like in particular to ask: what role can central banks play in the resolution of global imbalances? In other words, should monetary policy help foster the adjustment process and how?

It seems to me that an answer to this question encompasses three different issues: the role of monetary policy in achieving price stability, the way central banks should consider exchange rate changes and the question of whether and how central banks should react to an inflating asset market.

As I am sure that the other participants in this round-table discussion have their own views on the subject, I would just like to say a few words, taking mostly a euro area perspective, before I give them the floor. You will not be surprised if I start with price stability, our primary objective. In pursuing price stability, monetary policy makes its own contribution to economic growth in the euro area over the medium term. As such, this is an integral part of what the euro area can do to address the issue of current account imbalances. There is a large consensus today in Europe in respect of the continent's low growth over the last decade, namely that it is, to a great extent, structural in nature. The enhancement of potential output in the euro area should therefore be mainly based on structural reforms.

Regarding exchange rates, they are for us an indicator monitored under the economic pillar in our strategy. This means that the ECB does not react in any mechanical way to exchange rate changes; this is only one of the variables affecting economic developments and therefore influencing our decision-making. We will continue to take into account relevant developments, including the international environment, within a consistent framework aimed at ensuring price stability.

As mentioned earlier, when we consider other regions whose currencies are not fully market-determined, such as parts of emerging Asia, including China, there are, however, some indications that exchange rate policies have contributed to an unbalanced pattern of growth, with an excessive reliance upon external demand, leading to rising current account surpluses and investment activity in the tradable sector. Moving to a more flexible exchange rate regime is also in this case an effective way of avoiding an accumulation of excessive levels of reserves, and it is only one of the advantages of such a strategy. Indeed, a second consequence of the choice of a fixed exchange rate in China and other emerging economies in Asia concerns the domestic repercussions. With the external constraint of a fixed exchange rate, it is more difficult for a central bank to achieve domestic objectives, such as effectively controlling credit growth. There are some signs that tend to support this argument, notably the fact that money growth is growing above its target in China and that money growth volatility has increased with rising foreign exchange interventions.

At the current juncture, and for the long-term development of China, it seems therefore essential to gradually gain more flexibility regarding the exchange rate arrangement and to focus monetary policy on domestic objectives. This would imply a gradual and orderly adjustment of the currencies of countries with large external surpluses, in consistency with a rebalancing of the growth pattern of emerging countries in Asia. By strengthening in particular the domestic financial sector, this additional flexibility would further contribute to a smooth resolution of global imbalances. In this respect, I am only reiterating the recommendations outlined in the last G7 communiqué.

Finally, it has been argued that asset price bubbles have contributed to the growing current account deficits since the late 1990s (see, for instance, Kraay and Ventura, 2005). In this respect, a distinction could be made between asset price developments in the context of the "new economy" bubble and potential misalignments of asset prices observed in the recent period as global liquidity conditions remained generous for an extended period of time. While the mechanism behind a possible relation between asset prices and external positions may be analysed in the context of lower home bias and increased capital flows, the question of whether and how monetary policy-makers should and could react to such developments is much harder to answer. All the same, let me submit this question as a possible subject for debate in our panel discussion.

To sum up, I have presented what are, in my view, some of the main factors behind global imbalances, as well as the policy measures that can be implemented to ensure an orderly correction of these imbalances. I have also raised a few issues for discussion, focusing on the role that central banks can play in the resolution of global imbalances.

I now would like to give the floor to the other panel participants. We are honoured to have here today Vittorio Corbo, President of the Banco Central de Chile; David Folkerts-Landau, Managing Director and Head of Global Markets Research at Deutsche Bank; Vincent Reinhart from the Federal Reserve Board as well as Axel Weber, President of the Deutsche Bundesbank.

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Central banks and global imbalances

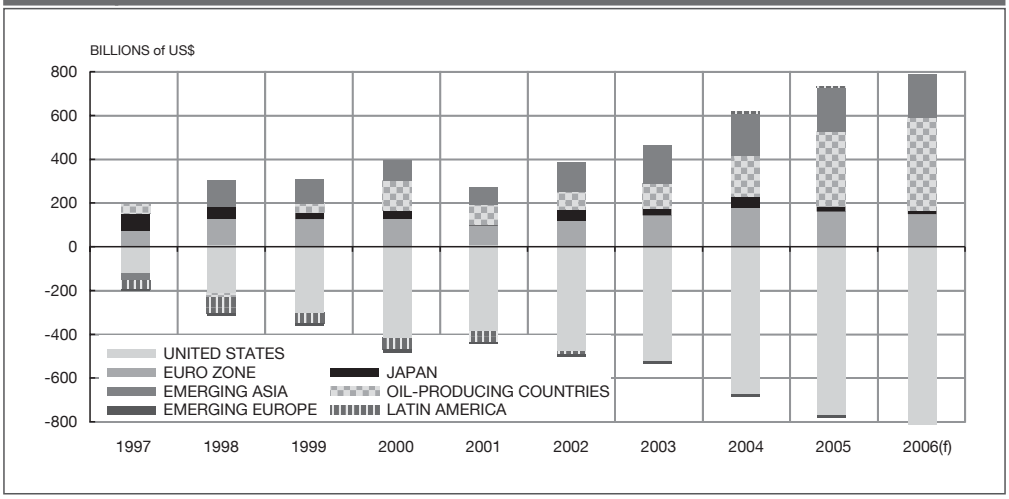
Vittorio Corbo
Banco Central de Chile

Despite some ups and downs, world economic growth is soon to complete its best three years in the past three decades, with annual growth rates more than one third higher than the 1970-2000 average. Furthermore, for the first time in many years, this strong dynamism has been driven by a more balanced regional composition. World growth, induced by a single player – the US – in 2004-2005, today brings several other protagonists together. Worth underscoring are the Euro Zone definitely leaving behind its former lethargy, Japan's continued growth, and China and India, whose combined share in world GDP at PPP reaches that of the United States and whose economies are growing at amazing rates that are not expected to end any time soon, given their enormous unexploited potential. Thus, this stronger growth scenario is also more balanced, which speaks of increased sustainability.

This favorable global scenario faces short-term risks together with a rather structural and longer-term risk. In the near horizon, there is concern about the high oil prices persisting longer than previously forecasted and rising even higher. Accordingly, there is the associated risk of developed countries being unable to curb inflation or even to stop it from rising, putting an end to the days when second-round effects of oil hikes were not passed through to other prices, and beginning a cycle where the economies without idle capacity begin to lose their ability to absorb inflationary pressures from oil, which, with new price shocks would only make things worse. If this scenario unfolds, monetary policy interest rates will need to rise further with secondary effects on financial markets and in emerging markets.

Over a longer horizon, the main concern is how global imbalances will be accommodated and what will be their repercussions. In other words, how global imbalances will be resolved. The US has seen its current-account deficit increase considerably for the past thirteen years, and it is expected to account for 6.5% of the nation's GDP and 2% of world GDP this year. So far, this ever-expand-

FIGURE 1 **CURRENT ACCOUNT BALANCE**



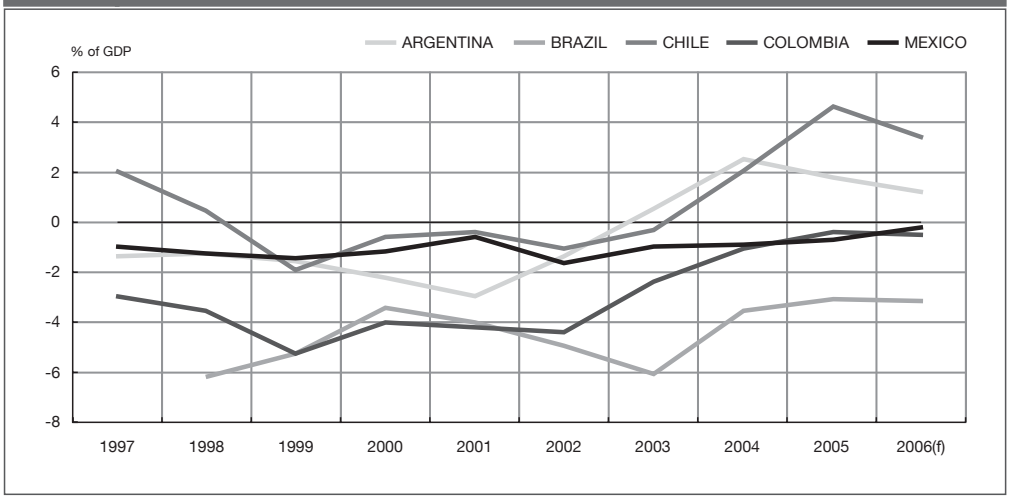
SOURCE: IMF's World Economic Outlook. September 2005.

ing deficit has been financed primarily by oil-producing economies, emerging Asia – especially China – , and Japan. Latin America's contribution has been negligible. In 2005, the region had a surplus equivalent to less than 1% of the US's current-account deficit. However, although the region is not helping to aggravate the imbalances, it can suffer the severe consequences of sudden changes in financial prices caused by this situation, which is believed by some to be unsustainable.

The earlier views on how the adjustment could occur were tainted by the Asian and Mexican crises, so the imbalance was expected to be solved abruptly when foreign investors lost interest in holding in their portfolios additional American assets at the existing interest rates and exchange rates. In such case a sudden stop would occur, thus causing a sharp breakdown to financing of the massive American consumption. US interest rates would rise and the dollar would overshoot. Consumption would slow down without compensating increases in surplus countries, causing major distress on world economic growth.

I believe this scenario, so popular until recently, is unlikely. The present flexibility and deepness of financial markets and portfolio choices in the rest of the world, suggest that the adjustment will be gradual and will take place through rather smooth changes in financial prices. In such case, demand can be expected to move steadily from deficit-ridden to surplus-running economies, while asset prices and consumption converge gradually to sustainable paths, as is already beginning to happen. Thus, larger savings in the US and increased consumption and/or investment in the rest of the world configure a more benign scenario for world growth, where the slowdown in US demand is partly offset by stronger demand elsewhere.

FIGURE 2 **GENERAL GOVERNMENT BALANCE**



SOURCE: Moody's Financial Handbook, November 2005. Ministry of Finance of Chile.
Forecast for Argentina, Brazil, Colombia and Mexico.

This gradual pace would be favored if Asia, especially China, would make its exchange rates more flexible to produce the necessary reallocation of expenditures. More flexible exchange rates would also help countries to regain control over their monetary policies. Still, this benign adjustment, if materialized, would be coupled with a moderate deceleration of world growth.

An alternative to this gradual adjustment is a proposal under economist Ricardo Caballero's line of research, which claims that these imbalances are an equilibrium solution in a world where very dynamic emerging countries have not developed sufficiently their financial markets or any attractive investment securities, whereas the US has done so with remarkable efficiency. In this case, the adjustment would also be gradual and would occur to the extent that financial markets could be developed further in emerging economies and part of capital flows returned to their countries of origin where they would meet with profitable investment options.

Recent news of increased demand in Japan and the EU, and of a slowdown in private consumption and the real estate market in the US increase the probability of gradual adjustment. However, while unlikely, the risks of a sudden adjustment are still present and policymakers cannot sit and wait for global imbalances to resolve themselves. On the contrary, they must promote steady and cooperative adjustment and take actions to reduce the negative impact such adjustment might have in their countries.

To promote gradual, cooperative adjustment, saving must be encouraged in the US through fiscal efforts and incentives to private saving; stimulate private

TABLE 1 **INFLATION RATES**
(ANNUAL AVERAGE PERCENTAGE)

	1980-1989	1990-1994	1995-1999	2000-2004
Argentina	565.7	515.8	0.8	8.3
Bolivia	1,383.1	13.4	7.4	3.0
Brazil	332.3	1,690.2	19.4	8.7
Chile	21.4	17.5	6.0	2.8
Colombia	23.4	26.3	18.0	7.3
Mexico	69.1	16.3	24.5	6.0
Paraguay	20.5	23.3	9.7	9.2
Peru	481.3	1,607.4	8.4	2.4
Uruguay	57.6	76.4	21.4	10.4
Venezuela	23.1	41.0	53.8	20.8
LA average	150.6	263.5	17.0	7.9

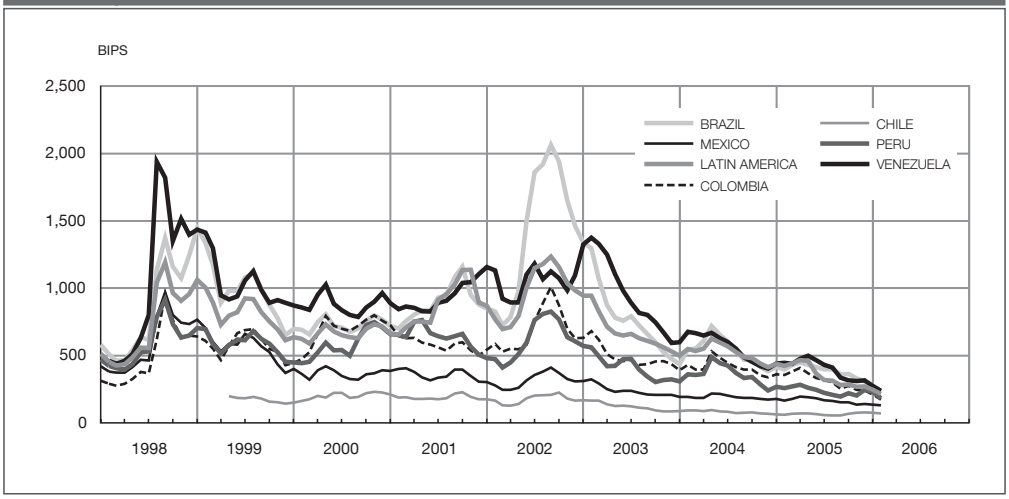
SOURCE: IMF (2006).

consumption in China – that saves over half its GDP – through financial reforms improving household access to credit and extending social protection networks in order to reduce precautionary saving, as the ones proposed in the latest Communist Party Committee. Also increase investment in emerging Asia – which collapsed in 1997 and has been unable to recover fully – through incentives to quality investment with structural reforms aimed at boosting expected returns, improving the ease to do business, increasing labor flexibility and promoting efficient resource allocation in financial markets.

Asian economies have addressed their crises through heavy hoarding of international reserves, that come quite inexpensive – or even profitable – to them at current interest rates and parities, in the hope that by so doing they will ward off a new crisis like that of 1997. The bad news is that they have let credit swell (especially China) and have neglected the reforms to the financial system that could protect them better from a shock. Finally, the adjustment could benefit from a reduction in the relative price of the US dollar in terms of other currencies, particularly the Chinese yuan/rembimbi.

Ex-post reactions intended to minimize the costs of an *abrupt adjustment* depend on the prevailing monetary and exchange policy framework. Countries with inflation expectations well-anchored in low levels and with limited currency mismatches should let the exchange rate adjust, thus driving the changes in relative prices. "Leaning against the wind" can only result in a capital flight, financial instability and a credit crunch. Countercyclical fiscal and monetary policies coupled

FIGURE 3 **COUNTRY RISK**



SOURCE: JP Morgan (2006).

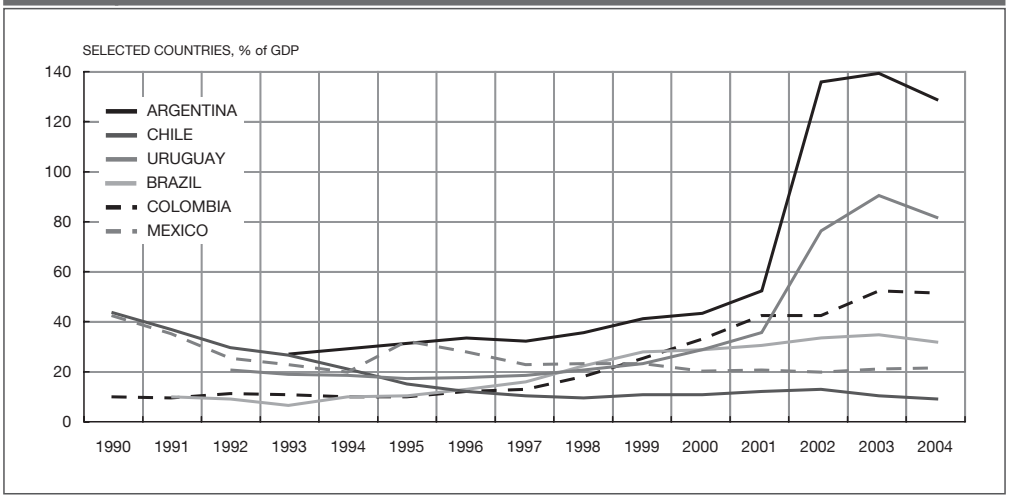
with a solid domestic financial system will help to address potential international financial crises with a reversal of capital flows, with a reduced need for international reserves accumulation.

Countries with de-anchored inflation expectations face a more complex scenario. Real depreciation will be shadowed by higher inflation or, if currency mismatches between assets and liabilities are large, depreciation will turn out to be contractionary because of important balance-sheet effects. To avoid a major financial crisis in these economies, the only tool they will have available will be fiscal policy, which would be recessionary.

Uncertainty regarding the way imbalances will be corrected has repercussions on economic policy decision-making. In emerging countries, monetary policy has limited or no impact on how adjustment happens. But regardless of its form, it undoubtedly affects monetary policy decisions, implementation and effectiveness. Increased uncertainty is something to take into account when projecting output and prices. The global scenario also makes it difficult to interpret the impact of monetary policy on demand and inflation.

The sound and stable macroeconomic environment that Latin-American countries have steadily built over the years has reduced their vulnerability to adjustments of global imbalances that might turn out to be more abrupt than expected. During the past two decades, and especially in the last five years, substantial advances have been achieved in economic policies and results. The fiscal discipline attained by these countries was unheard of before. Although Chile stands out, major improvements have been made in most countries. Annual inflation has been reduced from three-digit annual levels less than fifteen years back,

FIGURE 4 **PUBLIC DEBT** (a) **IN LATIN AMERICA**



SOURCE: ECLAC (2005).

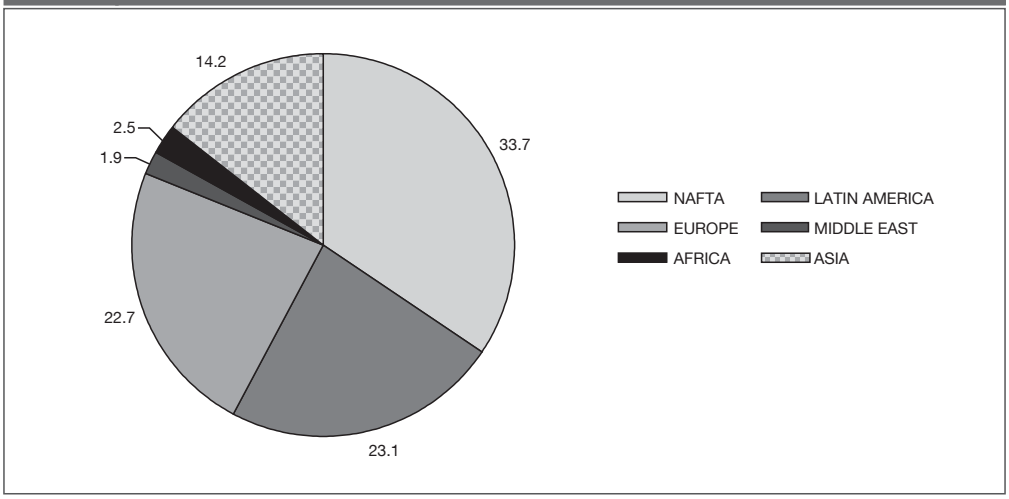
a. Debt of central governments.

to one-digit annual levels more recently. Current accounts have in most cases shifted to surplus positions, and sovereign spreads are down to historic lows, with the resulting reduction in the costs of foreign financing. This has boosted the countries' solvency, which in turn has permitted them to refinance their credits in much better terms. Finally, great advances in the development, supervision and regulation of the financial system have also helped to improve Latin America's resilience to shocks. But despite these advances, there is still a long way to go in terms of market liberalization, promoting competition and improving the efficiency of the state apparatus.

However, while Latin America is more resilient now than it was in the past, it is not fully protected and is sensitive to the way imbalances are ultimately corrected. An abrupt adjustment would increase sovereign spreads, enlarging the financial burden of the most indebted countries, such as Argentina and Uruguay, and might hurt the largest providers of goods to the US, whose demand would not be absorbed by others. Despite growing diversification, NAFTA members buy 34% of total Latin-American exports (excluding Mexico). Within the region, the most exposed are Mexico and Central America, because of their extensive commercial relations with the United States.

In conclusion, the world economy presents an exceptionally favorable scenario, where the big surprise has been the dynamism of China and India. However, this good environment is not free of risks. The most immediate threats are larger and longer-lasting rises in oil prices, and possible inflation increases in developed countries. Over a longer horizon, the biggest uncertainty lies in how global imbalanc-

FIGURE 5 **LATIN AMERICA EXPORTS BY DESTINATION**
2004



SOURCE: WTO (2006).

es will finally unwind. This, however, looks less urgent now with some signs of gradual adjustments already beginning to occur. Furthermore, countries are recognizing that the solution will involve many players that will need coordination. In fact, as was discussed in the last IMFC meetings, demand is appearing for cooperative adjustment that can help correct the global imbalances at the lowest possible cost in terms of world economy deceleration. Last, but not least, countries have managed to implement sound macroeconomic policies that will help smooth the adjustment and cushion the impact. However, they must continue to strive to strengthen their policies to create more favorable conditions for long term growth and to face a world with growing uncertainty.

Central banks and global imbalances

Vincent Reinhart,
Federal Reserve Board[1]

I APPRECIATE THIS OPPORTUNITY TO PARTICIPATE in in this distinguished conference on 150th the anniversary of the renaming of the Bank of Spain. The topic of this panel – global imbalances – is a particularly apt subject to talk about in the center of the empire that experienced the first and probably largest capital inflow problem in the last millennium. Absorbing the inflows of gold and silver in the sixteenth and seventeenth centuries created difficult sectoral adjustments and had even more complicated consequences for the political economy. Global adjustments – whether species flows, reparation payments, or the unwinding of prior imbalances – involve the transfer of real resources across national borders that has implications for relative prices, incomes, and wealth over time.

By the way, the views I just expressed about the Golden Age of Spanish Exploration are my own and are not necessarily shared by anyone else in the Federal Reserve System. This also holds true for everything else said today.

Some Background

It does not take many numbers for the enormity of the challenge confronting the global economy to become evident as our moderator clearly expressed. According to projections in the most recent World Economic Outlook, the U.S. current account deficit will extend its slide of the past decade and is poised to run at around $900 billion dollars next year, or 6½ percent of nominal GDP (Figure 1). No other sizable country or region is close to that outcome (Figure 2).

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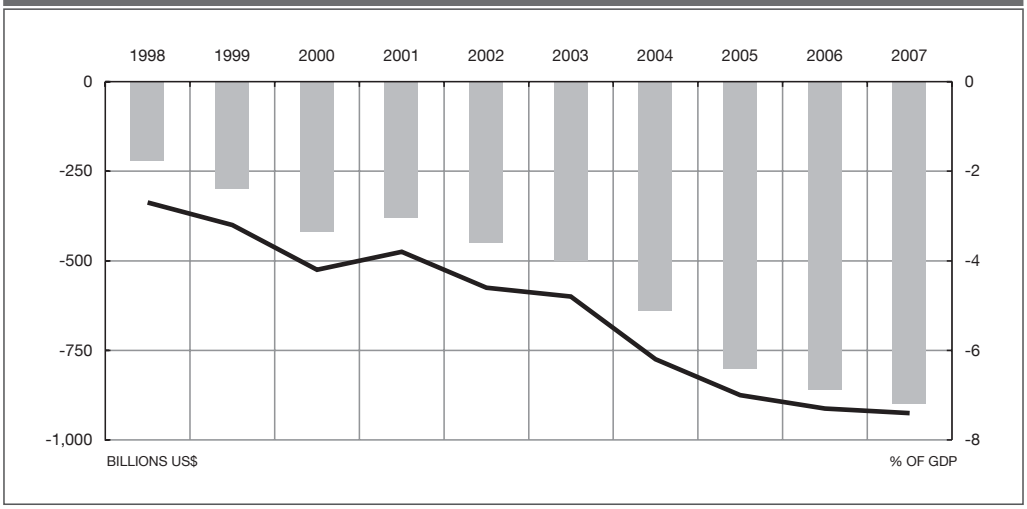
[1] The views expressed are my own and are not necessarily shared by anyone else in the Federal Reserve System.

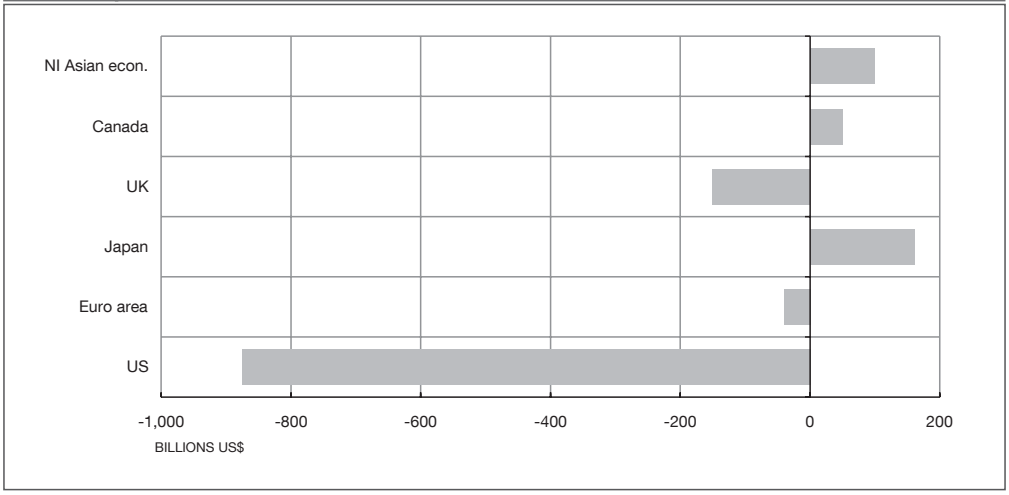
FIGURE 1 **US CURRENT ACCOUNT BALANCE**



SOURCE: IMF, World Economic Outlook.

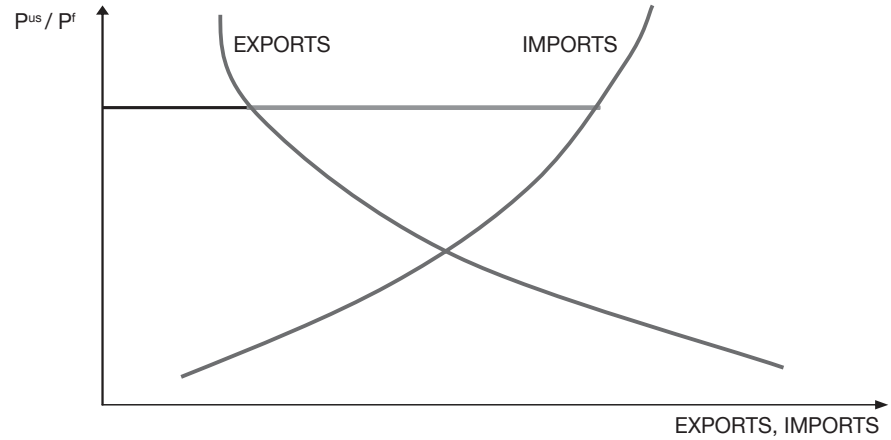
There have been many sophisticated attempts to put these imbalances into perspective, seen for example in the models of Obstfeld and Rogoff (2005) and Blanchard, Giavazzi and Sa (2005) in a recent Brookings volume. But at the risk of simplifying to the point of simplemindedness, I believe that the key points for understanding the current pattern of global imbalances are clear in the simple framework by which most of us were first exposed to the notion of external surpluses

FIGURE 2 **CURRENT ACCOUNT BALANCES IN 2006, SELECTED AREAS**



SOURCE: IMF, World Economic Outlook.

FIGURE 3 **THE DETERMINATION OF EXPORTS AND IMPORTS**



and deficits. Emboldened by Alan Blinder's ability to find sixteen questions pertinent to monetary policy, I will make six observations informed by this simple framework about the adjustment of global imbalances (Blinder, this volume). I will close by focusing in a bit more on some policy implications.

Although I do not have the yellowed document to prove it, in my first exposure to trade theory, I was taught that a country ran a trade deficit because relative prices encouraged the greater import of goods and services and discouraged their export (as in Figure 3). The horizontal difference between the demand curves for exports and imports represents the need to borrow to fund the relative excess. The analysis was somewhat more subtle by identifying five key margins relevant to understanding how any particular excess could evolve over time (Table 1).

The first margin is what I put along the vertical axis of the diagram – the relative price of traded goods produced domestically versus internationally – which is

TABLE 1 **KEY MARGINS INFLUENCING THE DETERMINATION OF EXPORTS AND IMPORTS**

The relative price of traded goods and services produced at home versus those produce abroad;
The relative price of traded goods and services produced at home versus nontraded ones;
Home versus foreign income;
Home versus foreign wealth; and
The dollar share of the foreign portfolio.

captured by movements along both curves. But the positions of these two curves may also depend on the prices of traded goods and services versus those that are not traded. For example, if nontraded services became particularly expensive, demand may shift some toward imports and import competing goods. Third and fourth, respectively, are the scale variables influencing demand at home and abroad – home versus foreign income and home versus foreign wealth – that also affect the position of the curves. The fifth margin does not directly affect the position of either curve but is critical to determining how those other four margins are set at a point in time and evolve over time. Namely, what is the appetite of global investors to add further to their dollar portfolios to fund the distance between those two curves at a given relative price?

We've heard one set of reasons from David Folkerts-Landau why that appetite might be large and growing so as not to force adjustment in those two curves any time soon. But another, related explanation has also been popular. The dollar share of the global portfolio may expand because either global economic growth has tilted to a region under diversified in dollar-denominated assets (as suggested by Michael Dooley, David Folkerts-Landau, and Peter Garber, 2005) or because financial globalization has been reducing home bias over time (as suggested by Alan Greenspan, 2005).

Six Observations

This leads to two observations on the expansion of the global portfolio. First, we should remember that Bretton Woods I was much less stable than commonly believed. Reinhart and Rogoff (2004) show that there was a wide array of multiple currency regimes, as well as black-market trading, that put the exchange rates that mattered for trade and asset holding at values quite different from any official peg. And the differences were changeable. Moreover, inflation performance was diverse, implying large divergences in real effective exchange rates. To the extent that those mechanisms are less available today (in part because of the leveling effects of the globalization of financial markets), more pressure may be exerted directly on the spot exchange rate, making the maintenance of a peg more difficult. Hence, I wouldn't bet that Bretton Woods II lasts as long as Bretton Woods I.

My second observation is that it is the *relative* change in home bias that matters for the change in the net dollar share in the global portfolio. But why would financial globalization act unequally on U.S. versus foreign investors? One possible answer sounds like a form of American triumphalism, in that our markets were integrated first and now others are catching up. But that seems inconsistent with the observation that the extent of home bias in U.S. portfolios still seems large. Another possible answer is that we've got the wrong model of portfolio determination. Rather than the outcome of investors smoothing consumption, we may be seeing

an increased demand for collateral that is both protected by a well-established rule of law and that performs well at a time of financial stress. Creating those instruments is something that the United States is very good at, as witnessed by the widespread acceptance of our currency and government securities.

Recognize how this argument turns the usual concerns about a disorderly adjustment on their head. In this world, elevated volatility and financial market strains associated with a potential downdraft in the foreign exchange value of the dollar would actually strengthen the demand for the dollar assets that serve as good collateral at a time of stress. I'm not suggesting that such flight-to-safety demands would roll back all the expectational effects that might push up yields were the exchange rate to slide sharply, but they would seem to be a blunting force not captured in traditional models, and ones that would work on different asset classes differently.

While on the subject of the role of assets, I believe, as my third observation, that an important role for assets in shaping behavior may have an ambiguous effect on the nature of the adjustment of imbalances. We've seen one side of that: There has been a recent recognition on the effect of exchange rate changes on the value of the gross portfolio (as in Lane and Milesi-Ferretti, 2004, and Gournichas and Rey, 2006). Both U.S. and foreign investors hold dollar-denominated obligations, so that dollar depreciation lowers net U.S. debt. However, U.S. net debt is also a part of foreign wealth. Thus, dollar depreciation raises U.S. net wealth and lowers foreign net wealth. If wealth and income effects are important in determining export and import demands, there is an offsetting drag to any direct benefit of lower indebtedness (as in the shifts depicted in Figure 4). The pressure of this offset is

FIGURE 4 **THE EFFECTS OF OFFSETTING CHANGES IN RELATIVE PRICES AND THE SCALE VARIABLES**

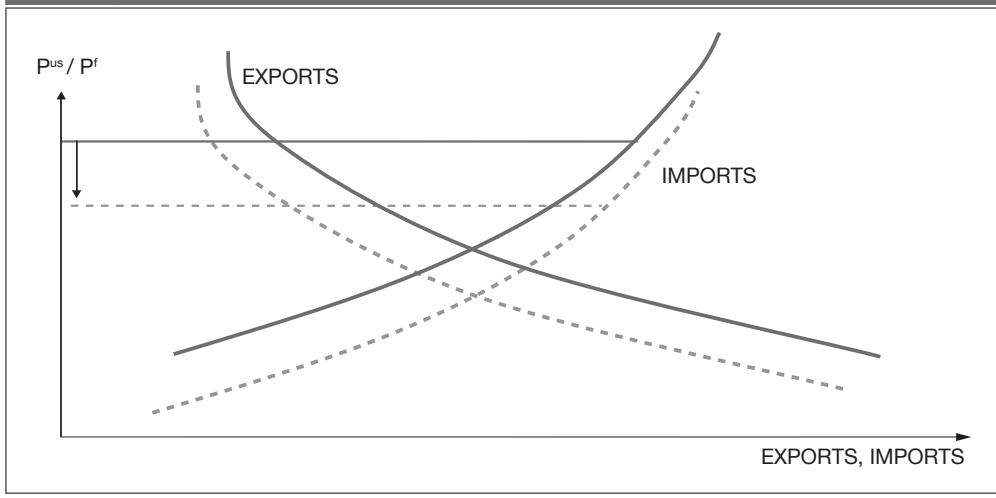
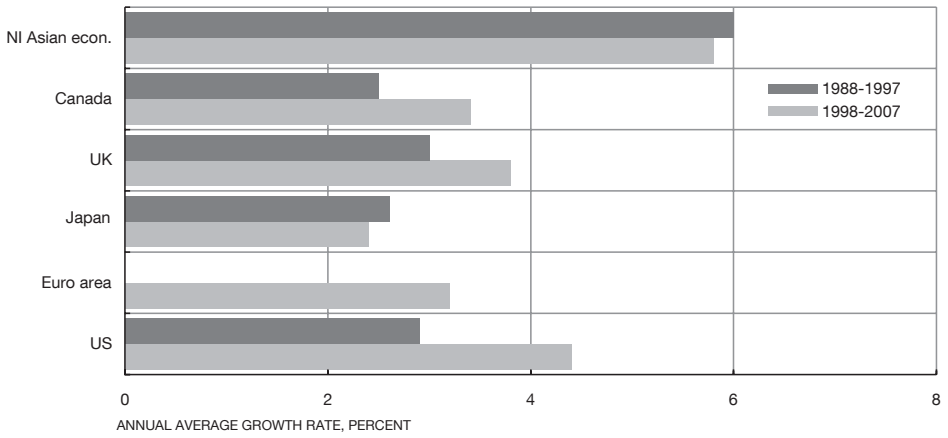


FIGURE 5 **PRODUCTIVITY IN MANUFACTURING**



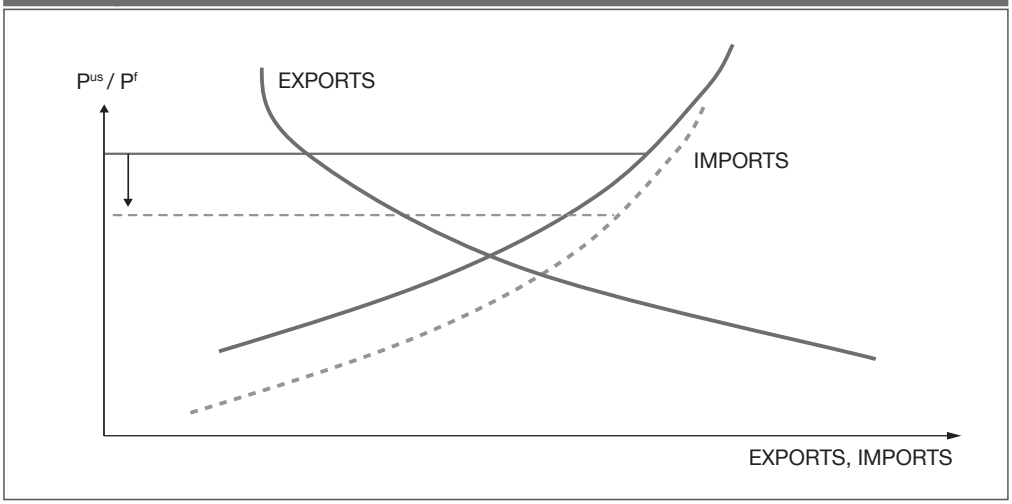
SOURCE: IMF, World Economic Outlook.

probably why researchers who include the gross balance sheet in their analyses find that the consequences for exchange rate adjustment need not be large.

Co-movements among the other margins shaping the external imbalance should importantly influence your view on the nature of the adjustment process. One source of concern, as in observation 4, is that in the United States the two key relative price margins may be related. A signal feature of U.S. economic performance has been the step-up in the growth of manufacturing productivity over the past decade (Figure 5). The good news is that faster productivity growth in manufacturing works to keep U.S. traded goods competitive with those from abroad. The bad news is that it also makes nontraded goods and services potentially relatively more expensive at home, encouraging demand for imports and import-competing goods. For example, an increase in the growth of productivity manufacturing at an unchanged exchange rate might shift the import demand curve as in Figure 6. (This general equilibrium effect might be one reason we saw those two remarkable features of the U.S. economic experience over the past ten years – the pickup in productivity growth and the steepening slide of the current account deficit).

My fifth observation is that two key external margins may be related. In particular, a depreciation of the dollar that lowers the relative price of U.S. to foreign goods should encourage our exports and discourage our imports. But, from the perspective of our trading partners, this represents an adverse aggregate demand shock. If policymakers abroad are not prepared to offset this drag, their relative income growth will suffer to the detriment of global demand for U.S. goods. Under that scenario, the United States will get a larger relative slice of the pie of global demand, but the pie may have shrunken (which produces shifts in the two curves similar to Figure 4).

FIGURE 6 **THE EFFECTS OF AN INCREASE IN THE GROWTH OF MANUFACTURING PRODUCTIVITY**



This leads to my sixth observation: Meaningful progress in reducing the U.S. imbalance cannot rely on change at a single margin. Some combination of relatively faster growth of income and wealth abroad and technical progress at home biased toward nontraded goods would likely set the market backdrop associated with a decline in the price of traded goods and services produced in the United States relative to those produced abroad. If this process were gradual, resources could shift efficiently to take the fullest advantage of these changed circumstances, lessening the magnitude of the necessary adjustment.

Monetary Policy Implications

What does all this mean for monetary policy? I'd like to address three questions: How should policy respond to a gradual adjustment process? Can monetary policy initiate the adjustment process? And how should policy respond to a sharp adjustment process and potential associated market strains?

From the perspective of the central bank, changes in the various margins during a phase of gradual adjustment can be taken for just what they are – relative shifts in prices, income, and wealth. As long as inflation expectations remain contained, relatively faster growth of the prices of imported goods for a time would be associated with a temporary bulge in overall inflation but would leave no significant imprint on core inflation. In that case, maintaining the full utilization of resources will both facilitate the movement of inputs of production needed to meet new, relatively higher foreign demands and foster price stability. To the extent that inflation expectations and core inflation were not impervious to more

rapid import price inflation, policymakers would be confronted with the more difficult challenge of weighing the threats to their dual objectives – but in the United States that is the role the Congress assigned to them. Not to prejudge that balancing, the experience of the past few decades suggests that it is important to draw a firm line at preventing inflation from picking up on a permanent basis.

If this seems familiar, it should. I was reading from the playbook page headed, "Asset prices and monetary policy".[2] The price of an asset, x, matters for policymakers to the extent that it influences the outlook for aggregate demand and inflation. Policymakers should respond systematically to that extent. To respond beyond that presumes a better understanding of asset prices than the market, risks the pursuit of the macroeconomic objectives, and could fail because the link between asset prices and the policy instrument is indistinct. Policymakers concerned about systemic strains should tackle the problem directly by strengthening financial regulation.

If the process of gradual adjustment looks attractive, should monetary policymakers do something to initiate the adjustment? Here it is pretty clear that you'd be looking to the wrong set of policymakers. The conventional recommendation is that easier policy at home and tighter policy abroad will depreciate the home currency and make home-produced goods more attractive. But remember Alan Blinder's admonition that we know the least about exchange rate determination and the observation that pass-through seems to have declined around the world.[3] Against that backdrop, it is in no way obvious that a central bank can be confident that it could get the adjustment process started in a meaningful way.

But even if the central bank could change the relevant relative price, would it necessarily improve the nation's trade position? In fact, the effects on the scale variables determining the position of the import and export demand curves may offset the effects of the relative price change. Looser policy at home and tighter policy abroad should lead to wealth and income changes that encourage imports and discourage exports, making the net effect ambiguous (which will be similar to the shifts already shown in Figure 4). The correct set of policies are those our moderator opened with: consolidation of the balance sheets of households and the government in the U.S. and structural reforms abroad.

Alan Blinder also asked us to re-think coordinated sterilized intervention yesterday. Suppose it was, indeed, employed to try to get the process of weakening the currency started. There are two possibilities. On the one hand, if it were successful, then subsequent monetary policy actions to stabilize the domestic economy would have to reverse some of those effects so as to keep inflation contained and

[2] See, for instance, Reinhart (2003).

[3] Evidence on the decline of pass-through is given in Ihrig, Marazzi and Rothenberg (2006).

resources at full employment, calling into question the credibility and consistency of policymakers. On the other hand, if market participants understand that some of the effects of a successful intervention would be rolled back by subsequent domestic policy actions, the odds that the policy works to begin with would seem to be lowered.

Lastly, I got the sense that the organizers wanted me to address how monetary policy should respond to a sharp adjustment of imbalances and potential associated market strains. I'm not going there. It is unhelpful to speculate in public about low-probability events, in part because each episode is different. Despite that request, I do appreciate participating in this panel.

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Central banks and global imbalances

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1 Introductory remarks

The debate on global imbalances is due mainly to the large and growing US current account deficit. In 2005 it amounted to an unprecedented USD 805 billion (6½% of US GDP). Estimates by the IMF for this year and next do not indicate marked changes in the US current account position. The United States accounts for around ¾ of the global aggregate current account deficit. Not surprisingly, the corresponding current account surpluses are more broadly spread. Among the major surplus regions, Asian economies like Japan and China and oil-exporting countries play the most important roles. By contrast, the euro-area's current account position is roughly balanced, although significant heterogeneities can be detected at the national level.

The current account positions of developed and emerging economies underwent marked shifts during the past few years. In 1998, the developed economies still had an aggregate current account surplus of USD 24 billion. In 2005, however, a current account deficit of USD 475 billion had emerged – predominantly caused by a worsening US balance. In 1998, the emerging economies and developing countries still had an aggregate deficit of USD 116 billion; in 2005, they had a surplus of USD 406 billion. Moreover, accumulation of currency reserves in emerging economies remains at a high level despite some slowdown in 2005. Total official currency reserves have more than tripled in the past ten years and almost doubled in the past four years.

2 The debate on sustainability

Given the global distribution of current account balances, developments at the global level are important, but developments in the US are key for judging the ultimate

sustainability of the current configuration. This is consistent with the G7 statement we issued at the Washington meeting in April. So, let's "Google Earth" the US economy.

The current account deficit in the US mirrors the low level of national saving. Net saving fell to a low-point of less than 1% of gross national income; a figure not reached since the Great Depression in the 1930s. By contrast, in 1998 the private saving rate was still as high as 6.5%. Household and public saving are both contributing to this development. In net terms, households' personal savings were negative in 2005 for the first time since the 1930s. Net government savings fell from a surplus of USD 240 billion in 2000 to a deficit of USD 323 billion in 2005. National savings have been supported by a steep increase in corporate savings owing to undistributed profits.

The large overall gap between national saving and investment of more than 6% of GDP corresponds, by definition, to the ballooning US current account deficit.

"Google Earthing" the global economy tells us that, up to now, funds have happily been supplied by the rest of the world. Will this continue? Or is it unsustainable? I tend towards the second camp. This immediately leads to the next question: If the US current account deficit unwinds, will it happen in an orderly or disorderly fashion?

2.1 Intertemporal considerations

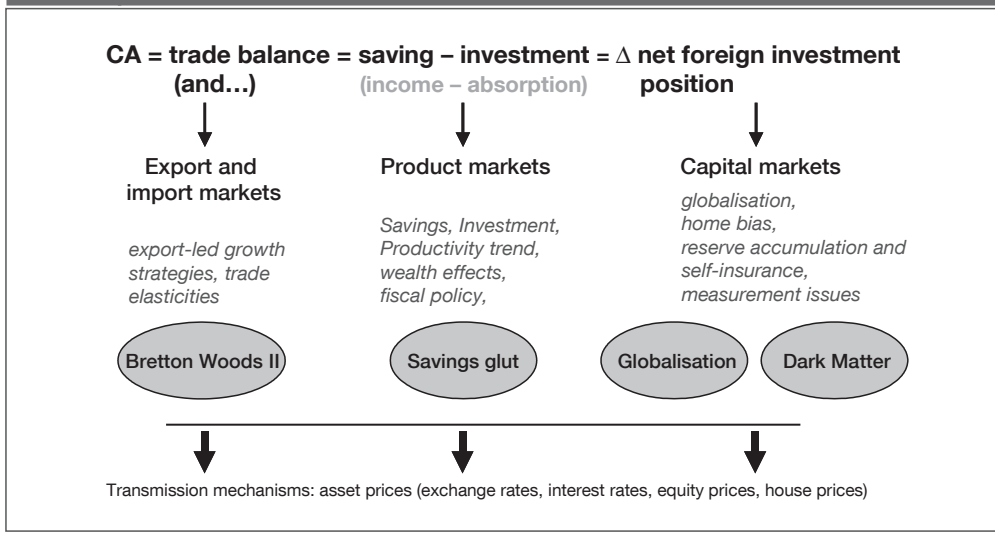
A fruitful discussion of sustainability needs to be formulated in terms of intertemporal considerations. Simple intertemporal mechanics suggest that the trajectory of US current account dynamics is not sustainable. A net external debtor cannot carry on accumulating trade deficits indefinitely in any intertemporal model. Continuation of current trends would likewise lead to a further massive increase in the USA's net debtor position. As an example, a 6.5% current account deficit and 5% nominal GDP growth leads to a negative net external position of 130% of US GDP, neglecting valuation effects. It would also imply an ever larger part of the US capital stock being in foreign ownership. This may also raise questions about political acceptance.

Given this background, it is justified to assume that adjustment will come, as what cannot go on forever will not go on forever and will eventually have to stop. The only question is "when and how?". At this point, the relevance of differing positions becomes apparent and explanations of the causes of the US current account deficit become important. Moreover, these explanations are crucial for possible policy measures as the remedy applied depends on the particular ailment.

2.2 Explanations for the longer-term persistence of the current imbalances

Several theories postulate that the accumulation of foreign debt by the US can go on for longer than commonly assumed. The explanations can be grouped under the following headings:

SCHEMA 1 **PERSPECTIVES ON THE CURRENT ACCOUNT**



— Globalisation
— Strength of the US economy
— Bretton Woods II
— Dark matter

These explanations each emphasise a different aspect of the fundamental determinants of the current account. They can be pedagogically separated into at least three fields, which are, of course, highly interdependent and not mutually exclusive since the current account is an endogenous variable which mirrors developments on nearly all relevant markets. These fields are the trade view, product market view and capital market view.

The core of the *globalisation argument* is as follows: integrated global financial markets reduce home bias and allow financing of higher current account deficits than hitherto. This is undoubtedly correct in part, but not an argument for the sustainability of the current configuration. Moreover, owing to possibility of herding, integrated capital markets may also complicate necessary processes of adjustment.

Proponents emphasising the inherent *strength of the US* economy argue that the attractiveness of US capital markets for global savings – due to high returns on capital owing to high productivity growth of the US economy – will continue to allow financing of deficits on the present scale. There is some truth in this argument, too, but it, likewise, is no argument against the simple intertemporal arithmetic. For example, even if US productivity growth were to permit nominal growth of 7%, the US net external debt position would show a massive increase before reaching a new steady state (over 90% of GDP in this case, compared to

130% were nominal growth only 5% on average, again neglecting valuation effects).

The *Bretton Woods II argument* postulates that the growing US savings gap can be financed without difficulty as long as the Asian (or other) central banks are willing to accumulate reserve assets denominated in US dollars. They will have an incentive to do so as part of an export-based and exchange rate-driven growth strategy. In my view, drawing a parallel between BW I and BW II, however, overlooks some relevant facts. Firstly, in the original Bretton Woods agreement, the United States was posting current account surpluses. Secondly, there are inherent high risks and costs of reserves accumulation that should be taken into account. Sterilisation gives rise to costs if interest rates at home are higher than abroad, non-sterilisation implies liquidity risks and threat of inflation. Moreover, the accumulation of reserves is linked to high valuation risks in the event of depreciation. This may constitute a first mover problem, although, it has to be said that asset management considerations are not the primary motivation for central banks' reserve holdings.

There is one last difference between BW I and BW II: in the euro, the current global financial system has a potential alternative reserve currency.

Last but not least, the *dark matter hypothesis* states that the US net asset position is not being captured accurately in the statistics and that, if these supposedly unrecorded assets – called "dark matter" – are taken into consideration, the current account deficit all but disappears. As their starting point, proponents of the dark matter camp take the somewhat surprising fact that despite a recorded negative US external position of USD 2.5 trillion, US cross-border income flows have been positive, amounting to USD 36 billion in 2004. The favoured explanation is this: US financial assets are recorded inaccurately – the discrepancy vis-à-vis official figures being called dark matter – due to the US enterprises' export of intangible assets, such as brand names and expertise.

One immediate criticism of this explanation is that the a priori assumption – that current account figures and net position are wrong, while the figures on cross-border income are correct – is more than questionable. For example, the possible role of tax-induced profit-shifting by multinational groups can distort cross-border income figures. Moreover, it is probable that the positive sign of the net investment income is due to differentials in the average returns between US investments abroad and foreign investment in the USA as the IMF pointed out some time ago. This has been recently confirmed empirically by research of Lane and Milesi-Ferretti. Reasons for this can be found in structural differences between the portfolio of US assets abroad and US liabilities – with more equity instruments on the asset side and more debt instruments on the liability side – and valuation effects due to exchange rate movements and asset price developments. Finally, US cross-border income is highly volatile; last year, it amounted to no more than USD 1.6 billion making dark matter itself an extremely volatile concept.

Summing up, in the final analysis, none of the theories put forward makes a convincing argument against the contention that there is a lack of sustainability in current global imbalances.

2.3 Empirical findings on effects of current account adjustments

Going back to my key hypothesis that what cannot go on forever will not go on forever leaves one point unanswered: will the unwinding of the current unsustainable configuration be abrupt and disorderly and, if it is, what will the macroeconomic consequences be?"

Empirical studies of historical cases of sharp declines in current account deficits do not provide us with clear cut answers. For example. while Croke, Kamin and Leduc, in a study by the Federal Reserve, discovered little evidence that past sharp current account adjustments in industrial countries resulted in cumulated economic stress, Sebastian Edwards found that sharp falls in the current account deficit do indeed tend to have a negative impact on growth. An inherent problem in studies of this kind, however, is that there is no historical precedent for the current situation with large and increasing deficits over a long period in the world's most important economy.

3 What role can policy play?

In view of the risks, the existing uncertainties about the when and how of eventual adjustment are by no means justification for inaction. Especially in the current favourable international setting, prudent policy demands a gradual implementation of adjustment mechanisms. This will be primarily a market process. However, policy can play a supporting role.

The unwinding of global imbalances is a joint task, as was also emphasised in the G7 statement in April 2006. This is all the more appropriate as empirical studies show that an adjustment through isolated channels is not very likely and would call for dramatic changes in the relevant variables and prices that are neither realistic nor desirable. Thus, the familiar three-pronged approach we reiterated at the G7 meeting in Washington remains valid.

Adjustment measures in the US aiming to increase national savings are key. In that respect, despite a somewhat loose general relationship between fiscal deficits and the current account in empirical studies, budgetary consolidation in the US remains of paramount importance. According to a Fed study, a 1 pp reduction in the government deficit would lower the current account deficit by up to 0.2 pp. According to an IMF study, it would actually be reduced by as much as 0.5 pp. If the IMF is right, medium-term balancing of the budget would therefore reduce

the current account deficit by 2 pp. Furthermore, households' savings in the US should perhaps be encouraged, although steering the private savings rate through political measures might prove difficult. Promoting energy saving could also play a part in bringing down the deficit considering that 2 pp of the US trade deficit alone (~1/3) is due to net imports of oil.

The Asian emerging economies and China, in particular, should likewise be aware of their responsibility in the unwinding of the global imbalances. Greater exchange rate flexibility will be needed as allowing appreciations would somewhat redirect growth strategy away from export orientation towards domestic demand. The recent Yuan revaluations are a welcome first step in the right direction.

There is an increasingly pressing need for a contribution by oil exporters. Oil-exporting countries should think to increase domestic absorption by strengthening investment in their countries.

For Japan and Europe (especially Germany), there are mainly structural reforms on the agenda. The central focus should be on enhancing the long-term growth potential, while short-term measures do not promise lasting success.

3.1 Role of European monetary policy

Generally, although global imbalances call for multilateral solutions, Europe's role is less important than that of USA, oil exporters and Asia/China.

Europe's contribution consists of achieving greater absorption capacity. Crucial in this respect, however, are sustainable measures (structural reforms), not short-term demand policy.

This has immediate consequences for the role of European monetary policy: it should provide the appropriate conditions to foster sustainable growth in the euro area. At the current juncture, that entails safeguarding price stability by anchoring long-term inflation expectations. As a matter of principle, there is no room for subordinating monetary policy to exchange rate objectives. Finally, monetary policy should speak out clearly about the need for structural reforms in the euro area.

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Financial Stability

Financial stability and globalization: getting it right

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Getting the financial system to work well is critical to the success of an economy and is a key element in economic development. The financial system is a coordinating mechanism that allocates capital to productive investment opportunities. If capital goes to the wrong uses or does not flow at all, the economy will operate inefficiently and economic growth will be very low.

Financial globalization, the liberalization of the financial system to open it up to inflows of foreign capital, has several important benefits in emerging market economies. First, it lowers the cost of capital, thereby encouraging investment which promotes growth. Second , when foreign capital and financial institutions are allowed to enter a country, they improve the allocation of capital. Third, globalization of the financial system helps promote the development of better property rights and institutions that make the domestic financial sector work better in getting capital to productive uses.[2]

However, financial globalization is not necessarily always a force for good: it can go very wrong. Opening up the financial system to foreign capital flows can and has led to financial instability and disastrous financial crises, which have resulted in great pain, suffering and even violence. (There was widespread ethnic

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[1] An earlier version of this paper was entitled "Getting Financial Globalization Right". This paper draws heavily on material in chapters 8-12 of my forthcoming book, The Next Great Globalization: How Disadvantaged Nations Can Harness Their Financial Systems to Get Rich.

I want to thank for their helpful comments, David Archer, Christian Broda, Jerry Caprio, Bill Easterly, Barry Eichengreen, Bob Flood, Ross Levine, Sergio Schmukler, Jane Tufts and participants in the World Bank Conference, Globalization and Financial Services in Emerging Market Countries. I also thank Emilia Simeonova for helpful research assistance.

Any views expressed in this paper are those of the author only and not those of Columbia University or the National Bureau of Economic Research.

[2] Recent surveys of the impact of financial globalization on growth include World Bank (2001), Levine (2004) and Schmukler (2004) and Mishkin (2005a, 2006).

violence in Indonesia after its crisis and in the wake of Albania's financial crisis there were around 2500 casualties.) This is why financial globalization is so controversial. Thus, the issue is not whether financial globalization is inherently good or bad, but whether it can be done right.

This paper discusses policies to achieve successful financial globalization. It starts by discussing policies which are needed to end financial repression in emerging market countries, then discusses policies which can help promote financial stability and make financial crises less likely. It ends by outlining how the international community can help encourage financial reform so that the full benefits of financial globalization in emerging market countries can be achieved.

Promoting financial development

In order to get a financial system that channels funds to those with the most productive investments, an emerging market country must end financial repression and promote financial deepening, that is increase the scale and development of the financial sector. But how can emerging market countries do this? They first need to develop an institutional infrastructure that enables the financial system to allocate capital efficiently.

The basic principles for developing the institutional infrastructure that fosters financial development have been discussed extensively in the literature and I outline them briefly.[3]

1 *Develop strong property rights.* Investments will not be undertaken if the fruits of the investment are likely to be taken away by the government or others, and so strong property rights are needed to encourage productive investment. Strong property rights are also necessary to create collateral which gives lenders confidence that they can cope with asymmetric information problems of adverse selection and moral hazard they encounter when providing funds to borrowers.

   Property rights need to evolve over time to suit local conditions. De Soto (2000) describes how British property rights for land, which were based on a long-established title system, had to be modified to apply to the new lands in North America in the 18th and 19th centuries, illustrating that a system for defining property rights in one country may not work effectively in another. Rodrick (2003) has emphasized this point in discussing China's recent approach to defining property rights. The Chinese government decided to allocate property rights in a couple of nonstandard ways. First by

[3] Chapter 2 of Mishkin (2006) discusses these principles in far more detail.

developing the Household Responsibility System (HRS), in which local officials assigned land to individual households according to their size. Under this plan, farmers could develop their land, produce food and sell it for their own profit, thus giving them the incentive to increase production. To increase manufacturing output, the Chinese government allowed the establishment of Town and Village Enterprises (TVEs), in which the ownership rights to business were given to the local government of the township or village and not to individuals. Because the TVEs could keep the profits and use them to provide goods and services to the community, they now had an incentive to make good investments and be efficient.

Although the TVEs and Household Responsibility System did not confer private property right as we know them, they probably worked far better in China at its early stage of development than more standard private property rights – standard private property rights would not have been enforceable because a legal system to enforce them was not in place. Indeed, having local governments own enterprises gave the local governments an incentive to make sure that the profits from these enterprises would not be appropriated by the central government or by officials of the central government.

The experience in China raises an important theme in this paper. Institutions that work well in advanced countries may not always work well in developing countries; they may have to be adapted to the local environment. Even in China, what has worked in the past is less likely to work in the future. Their system of property rights needs to undergo changes because entities like the TVEs are often too small to be the engine of economic growth. If China is to be successful in its next stage of development, it needs to establish a modern financial system to allocate funds to larger enterprises. The Chinese government must now create property rights based on the rule of law if it is to develop a modern financial system.

2 *Strengthen the Legal System.* An essential step in supporting strong property rights is a legal system that enforces contracts quickly and fairly. Such a legal system reduces moral hazard problems and encourages lending. For example, lenders write restrictive covenants into loan contracts to prevent borrowers from taking on too much risk, but such covenants only have value if they can be legally enforced. An inefficient legal system in which loan contracts cannot be enforced will prevent productive lending from taking place. If is too expensive to set up legal businesses or to get legal title to property, the poor will never get access to the legal system and so will be cut off from lending that could help them open up small businesses and escape poverty.

3 *Reduce Corruption.* Eliminating corruption is also essential to strengthening property rights and the legal system. When a corrupt official demands a bribe she reduces the incentives for entrepreneurs to make investments. The ability to buy off judges weakens enforcement of legal contracts that enable the financial system to function smoothly.

4 *Improve the quality of financial information.* High quality financial information is essential to well-functioning financial markets. If lenders cannot figure out what is going on in a firm, they will be unable to screen out good from bad credit risks or monitor the firm to ensure that it does not take on too much risk at the lender's expense. In other words, if information is too asymmetric, the adverse selection and moral hazard problems will prevent profitable lending, and productive investment will not take place. To make information easier to get accounting standards must be high enough so that prospective lenders can make sense of what is in a business's books. Also setting up standards for credit reporting to encourage the establishment of credit registries (also called credit bureaus), which share information about the credit history of prospective borrowers can be especially beneficial in increasing lending to households and small business borrowers.[4] Rules also have to be enforced that require businesses to disclose information, so that prospective investors can make sensible decisions as to whether the business deserves to get their hard-earned money.

5 *Improve corporate governance.* In order for people to be willing to buy stocks, which is another way of channeling funds to business, there must also be rules that make sure that the managers of corporations act in the stock holders' interest. If managers find it easy to steal from the corporation, or to use funds for their own personal use rather than for the benefit of the company, no one will want to invest in the company.

6 *Get the government out of the business of directing credit.* Too much government involvement in allocating credit also hinders the flow of funds to productive uses. State-owned financial institutions do not have incentives to make profits and so are often willing to make loans to those who are politically connected rather than those whose investment will increase productivity. Similarly when governments allocate credit directly, it is likely to go to the politicians' cronies or to business interests that support their campaigns.

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[4] See World Bank (2001) Tullio Japelli and Marco Pagano (2001, 2003), Inter-American Development Bank (2005), for discussions of the benefits of credit registries. The empirical evidence finds that countries with credit registries have on average nearly nine percentage points greater financial development than countries that don't.

How financial globalization promotes financial development

If developing the institutions that make the financial system work well is so important to poorer countries' well being, why doesn't it happen? Setting up the infrastructure for an efficient financial system is by no means easy. In addition, powerful elites in countries often oppose the necessary reforms because it will weaken their power or allow other people to cut into their profits. How can poorer countries overcome these obstacles?

Liberalizing the domestic financial system through financial globalization is one key way. Opening up to foreign financial institutions increases competition in the financial system. As domestic financial institutions start to lose business to better run and more trustworthy foreign institutions, they realize the need for a better legal and accounting infrastructure that will make it easier for them to minimize adverse selection and moral hazard problems as they seek out new customers. Domestic financial institutions will be far more likely to advocate and support the reforms to make this happen.

Allowing foreign financial institutions to operate in an emerging market country brings in expertise developed abroad. Bringing in best practices from other nations in areas such as how to screen good from bad credit risks and how to monitor borrower activities to reduce the amount of risk they take directly improves the functioning of financial markets.[5] Because of their familiarity with more advanced financial systems, foreign financial firms also are likely to increase the pressure on the domestic government to make reforms that will make the financial system work more effectively. Opening up to foreign capital also has the benefit of directly increasing liquidity and lowering the cost of capital for those with productive investments to make.[6]

The dark side of financial globalization: financial instability

Although financial globalization can generate huge benefits for emerging market countries by encouraging development of the financial system, it has a dark side: it can lead to financial instability and crises which have a devastating impact on the economy. In a now famous, but initially ignored, paper published in 1985, "Good-

[5] This argument is made in World Bank (2001) and Goldberg (2004).

[6] When stock markets in emerging market countries are opened to foreign capital, dividend yields fall, there is an increase in average stock prices and liquidity goes up (Levine and Zervosm 1998, Bekaert, Harvey, and Lumsdaine (1998) and Henry, 2000a,b.)

bye Financial Repression: Hello Financial Crisis," Chilean economist, Carlos Diaz Alejandro (1985), was way ahead of his time in warning of the dangers of financial globalization. Given a government safety net for financial institutions, particularly banks, liberalization and globalization of the financial system often encourages a lending boom which is fueled by capital inflows. Because of weak prudential supervision by bank regulators and a lack of expertise in screening and monitoring borrowers, losses at banking institutions begin to mount. With a weak banking sector, the government can no longer raise interest rates to defend the domestic currency because doing so would cause even more distress in the banking sector and precipitate a bank panic. Once market participants realize that the government no longer can defend the currency, they engage in a speculative attack, leading to a currency crisis and a large devaluation. Because so many firms in emerging market countries have their debt denominated in foreign currencies such as dollars, the currency collapse produces a sharp increase in their indebtedness in domestic currency terms, while the value of their assets usually remains unchanged. The resulting destruction of firms' balance sheets then makes it more difficult for the financial system to solve asymmetric information problems and lending to firms contracts sharply, leading to a seizing up of the financial system and often a devastating economic contraction.[7]

Financial instability which follows financial liberalization and globalization create two problems. The most obvious one is the economic hardship following the resulting crisis, which particularly hurts the poor (Halec and Schmukler, 2003). Second, is that the resulting financial instability gives financial globalization a bad name and can provoke a backlash against both financial globalization and liberalization which retards financial development.

Prudential regulation and supervision

Since financial institutions like banks are at the core of what can go wrong and trigger financial instability, promoting financial stability to prevent financial crises must start with governments' providing effective prudential supervision and regulation of the financial system. To do so requires implementation of several types of reforms.[8] To understand what form these reforms might take, we need to

[7] The above dynamics of financial crises in emerging market countries is discussed in Mishkin (1996) and Chapter 4 of Mishkin (2006), while case studies of these crises are found in chapters 5-7 of Mishkin (2006).

[8] One area of prudential regulation and supervision that I do not discuss here is capital controls. Capital controls are highly controversial and would require an extensive discussion that I do have space for in this paper. I do discuss them in Chapter 9 of Mishkin (2006). The conclusion that I reach is that in general capital controls are not to be recommended, although a form of prudential controls that would restrict how fast banks could expand their foreign borrowings could be beneficial.

draw on the experience that many countries have had with prudential supervision, which requires discussion of a fair amount of detail. We must not forget, however, that reforms in one country do not always work well in another. The details of the reforms may require substantial modification in particular circumstances, and so the reforms discussed below should not be viewed as a checklist that every country has to follow exactly. Instead, they point to the direction where emerging market countries need to head in order to make financial globalization work for them.

1 Limit currency mismatch

Emerging market countries almost always suffer from *currency mismatch,* that is many firms have debt denominated in a foreign currency like the U.S. dollar *(liability dollarization),* while the value of their production and assets is denominated in their domestic currency. As we have seen in countries with currency mismatch, currency crises and devaluations will trigger full-fledged financial crises by decimating the balance sheets of nonfinancial and financial firms.[9] (This does not usually happen in industrialized countries because their debt is generally denominated in domestic currency.)

The economy would be far less prone to financial crises if the issuance of foreign-denominated debt was discouraged, especially for firms that have their production sold in domestic markets.[10] Although reducing foreign-denominated debt is not an unmixed blessing because it might prevent some firms from borrowing,[11] there are strong reasons to believe that excessive liability dollarization is detrimental to the health of developing economies. Governments are more apt to bail out firms and banks when they all fail together and this is exactly what happens when firms have borrowed heavily in foreign currencies and the currency depreciates. Thus the government safety net encourages financial and nonfinancial firms to borrow in foreign currencies, even though this leaves the economy more vulnerable to financial crises.[12]

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[9] Allen, Rosenberg, Keller, Setser and Roubini (2002), argue that "almost all recent crisis episodes were marked by currency mismatch exposures."

[10] This is consistent with evidence in Calvo, Izquierdo and Mejia (2004) who find that more liability dollarization is associated with a higher probability of financial crises and more severe crises.

[11] De la Torre and Schmukler (2003) suggest that liability dollarization and currency mismatch may be a sensible way for firms to reduce risk. Thus limiting liability dollarization may have costs as well as benefits, implying that doing this right may be more complex than many advocates for restricting the use of foreign-denominated debt recognize.

[12] See Levy-Yeyati (2003), Broda and Levy-Yeyati (2003), Caballero and Krishnamurthy (2003) provide an additional reason for why liability dollarization may be excessive because firms that can borrow abroad in foreign currencies do not recognize the social value in providing insurance to domestic firms that do not have access to foreign borrowing.

Because so much of foreign-denominated debt is intermediated through the banking system, regulation and supervision to force banks to acknowledge and reduce the risk posed by currency mismatches could greatly limit liability dollarization and enhance financial stability.[13]

Similarly, restrictions on corporate borrowing in foreign currency or tax policies to discourage foreign-currency borrowing could help make the economy better able to withstand a currency depreciation without undergoing a financial crisis. Anne Krueger (2000), now the First Deputy Managing Director of the IMF, has even suggested that emerging market countries should make foreign-currency debt incurred by domestic firms unenforceable in domestic courts and that restrictions should be placed on financial institutions in industrialized countries to limit lending to emerging market countries using industrialized country currencies. However, blanket restrictions or tax policies to discourage borrowing in foreign currencies may be too draconian because firms that have their production priced in foreign currency should be borrowing in foreign currency in order to limit their exchange rate risk.[14] A more nuanced approach that focuses on systemic risk to the economy from currency mismatch, rather than just the amount of liabilities denominated in foreign currency, makes more sense.

Another reason domestic residents in emerging market economies use foreign currencies from industrialized countries to denominate debt is because these currencies have more stable purchasing power and therefore less inflation risk than domestic currencies. If domestic residents have access to debt indexed to inflation, they would have an alternative way to lower their inflation risk and liability dollarization would be less likely to occur.[15] However, domestic residents can be provided with an alternative way to lower their inflation risk if they have access to debt indexed to inflation. With indexation, debt contracts would be denominated in an index unit tied to a price level index like the Consumer Price Index (CPI) so that when the price level rises, the nominal value of debt would rise one-for-one. With indexation, the real value of the debt in terms of goods and services would remain unchanged. In the 1960s, Chile developed an indexing unit (the Unidad de Fo-

[13] Goldstein and Turner (2004) has an excelent survey of the literature on currency mismatches and provides additional recommendations to deal with currency mismatches.

[14] Goldstein and Turner (2004), for example, disagree with the Krueger proposal as being too draconian because the concern should be with currency mismatches rather than liability dollarization per se. In addition, restricting dollarization may lead to a reduction of financial deepening, both directly and because financial intermediation would move offshore (De Nicolo, Honohan and Ize (2003) and Inter-American Development Bank (2005), chapter 4).

[15] The argument here is for the indexation of financial contracts only. The indexation of other contracts, especially labor contracts, may have negative consequences as seen in Latin America in the 1980s. Indexed labor contracts, which are typically indexed to past inflation, have the undesirable consequence of putting substantial inertia into the wage-setting process, thereby making it harder to wring inflation out of an economy.

mento, UF), and indexation of debt and other contracts became widespread. As a result Chile was able to avoid liability dollarization, despite having high and variable inflation rates similar to other countries in Latin America that had very high liability dollarization.[16] [17]

2 Without proper institutional backup, do not adopt deposit insurance

Deposit insurance, which protects depositors from losses when banks fail, originated in the United States. In 1960 only six countries had emulated the United States and adopted deposit insurance, but this began to change in the late 1960s, with the trend accelerating in the 1990s, when the number of countries adopting deposit insurance doubled to over 70. Despite its popularity, deposit insurance is mixed blessing. By decreasing the incentive for depositors to withdraw their money if the bank gets into trouble, it can prevent bank panics because depositors will no longer run on the bank.

On the other hand, deposit insurance increases moral-hazard incentives for banks to take on excessive risk. Without adequate prudential regulation and supervision to reduce banks' incentives to take on too much risk, deposit insurance can increase, rather than decrease, the likelihood of a banking crisis and this is exactly what has occurred in many emerging market countries. Research done primarily at the World Bank (Kunt and Enrica Detragiache, 2002, Kunt and Kane, 2002, Cull, Senbet, and Sorge, 2001, World Bank, 2001) has found that, on average, the adoption of explicit government deposit insurance is associated with more instability in the banking sector and a higher incidence of banking crises. Furthermore, it seems to retard financial development. However, these negative effects occur only in countries with weak institutional environments: an absence of rule of law, ineffective regulation and supervision of the financial sector, and rampant corruption. Again, this illustrates the point that policies that work in advanced countries may not work in developing countries.

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[16] Ize and Levy-Yeyati (2003) find that dollarization is significantly lower in countries where indexation of contracts is prevalent.

[17] Private markets are rarely able to develop indexed debt contracts on their own, and so active government involvement to encourage indexation seems to be required to develop indexed-debt markets. E.g., see Shiller (1997). (This has been true in the United States where markets in indexed debt did not start to develop until the U.S. Treasury began to issue TIPS [Treasury Inflation Protection Securities] in January 1997). As has been carefully documented by researchers at the Central Bank of Chile (Herrera and Valdes, 2003), avoiding dollarization and the development of indexed debt markets in Chile was not easy: it was a long, slow process, which required both implementing regulations to encourage indexation and substantial issuance of indexed debt by the Chilean authorities.

3 Restrict connected lending and prevent commercial enterprises from owning financial institutions

The financial sectors of many developing countries are rife with *connected lending*, loans made by financial institutions to their owners or managers, or to the business associates (and friends and family) of the owners or managers of the institution.[18] This characteristic was instrumental in the 1994-95 collapse of Mexico's financial system. Financial institutions have less incentive to monitor loans to their owners or managers, a situation that increases the moral hazard incentive for the borrowers to take on excessive risk. These risky loans expose the institution to potential loan losses. In addition, connected lending in which large loans are made to one party can result in a lack of diversification for the institution, further increasing the risk exposure of the bank.

Restrictions on connected lending can take several forms.[19] Most countries have regulations limiting connected lending and many developing countries have limits on the books that are stricter than those in industrialized countries, but these limits are often not enforced effectively. An IMF study published in 1995 before the East Asian crisis (Folkerts-Landau, et al. 1995), found out that bank examiners in Asia were often unable to assess the amount of connected lending because they lacked the authority to trace to whom loans were made and because the banks hid the loans in dummy accounts. Strong efforts to increase disclosure of connected lending and to increase authority for bank examiners to verify the accuracy of loan information is crucial to controlling this moral hazard.

Having commercial businesses own large shares of financial institutions also increases the incentives for connected lending. The Korean financial crisis of 1997 was caused in part by chaebols (large commercial conglomerates) ownership of merchant banks, which were virtually unsupervised (Hahm and Mishkin, 2000). The merchant banks supplied the chaebols with large amounts of money by borrowing abroad and lending the proceeds to them. As a result of the exces-

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[18] As documented in La Porta, Lopez-de-Silanes and Zamarippa (2003), 20% of all large loans outstanding from 1995 to 1998 in Mexico had gone to bank directors, while these insider loans had interest rates that were 4 percentage point lower than those on other loans, a 33% higher default rate and a 30% lower recovery rate for collateral.

[19] Barry Eichengreen (2002), argues that restrictions on connected lending can hinder financial transactions in emerging market countries because it may be the only effective way of structuring and enforcing financial contracts in countries where the information and contracting environments are weak. There are informational and enforcement benefits that can accrue from family and other connections, and this is why it often makes sense to have interfamily lending and family control of businesses in poorer countries. However, connected lending by banking institutions which have access to a government safety net leads to huge moral hazard and excessive risk-taking that is very destructive, and this is why it needs to be restricted.

sive risk taking by the merchant banks, who were making risky loans to the chaebols, most of them became insolvent, and their insolvency was a key factor in the Korean financial crisis. Preventing commercial enterprises from owning financial institutions is crucial for promoting financial stability in emerging market countries.

4 Ensure that banks have plenty of capital

Requiring that banks have sufficient equity capital is another way to change the bank's incentives to take on less risk. When a bank is forced to hold a large amount of equity capital, the bank has more to lose if it fails and is thus more likely to pursue less risky activities.[20]

Bank capital requirements can take on two forms. The simplest type, the *leverage ratio,* is based on the amount of capital divided by the bank's total assets, while more complicated type of risk-based capital requirement, codified under the Basel Accord, requires banks to hold a certain amount of capital depending on the type of assets the bank holds and an assessment of how risky they are. Although the Basel Accord does encourage banks to reduce risk by making them hold more capital when they hold higher risk assets, it was designed for advanced countries' banking systems and is not as effective for emerging market economies. For example, the Accord classifies government bonds as having the least risk of all bank assets. This may make sense in advanced countries where government bonds are extremely unlikely to ever experience a default, but this is certainly not true for government bonds issued by emerging market countries. In fact, a major factor in the banking crisis in Argentina was that the value of banks' holdings of Argentine government bonds fell sharply when these bonds went into default. In addition, emerging market economies are subjected to much larger shocks than are advanced economies, and thus the increased risk that banks in these countries face indicates that the amount of capital they hold should be even larger. Thus bank capital requirements in emerging market economies need to be even more stringent than the international standards adopted by bank supervisors in advanced countries.[21]

[20] Bank regulations that restrict banks from holding particular risky assets such as common stocks or real estate are another means of ensuring that banks to not take on too much risk. Risk can also be reduced by regulations that promote diversification and prevent banks from concentrating loans to one large borrower or to a particular class of borrowers.

[21] A counter to the view here is provided by Barth, Caprio and Levine (2005). The find little evidence that capital regulations improve bank stability, although they are cautious in interpreting this result. They, however, do take a stronger stance that regulatory restrictions have negative consequences for bank efficiency and stability in countries where property rights and political institutions are weak. Their evidence suggests that going too far in adopting regulatory restrictions in developing countries may be counterproductive.

5 Focus on risk management

The traditional approach to bank supervision has focused on the quality of the bank's balance sheet at a point in time and on whether the bank complies with capital requirements. Although the traditional focus is important in reducing excessive risk-taking by banks, it alone may no longer be adequate. Financial innovation has produced new markets and instruments that make it easy for financial institutions and their employees to quickly take on huge amounts of risk. In this new financial environment, an institution that is healthy today can be driven into insolvency extremely rapidly from trading losses. This point was forcefully demonstrated by the failure of Barings Bank in 1995 which, although initially well capitalized, was brought down in a matter of months by the losses incurred by a rogue trader. An examination that focuses only on a financial institution's balance-sheet position at a point in time may not be an effective indicator of whether a bank will be taking on excessive risk in the near future.

Bank examiners in developing countries can help promote a safer and sounder financial sector by assessing how banks manage risk by evaluating: 1) the quality of the risk measurement and monitoring systems, 2) the adequacy of policies to limit activities that present significant risks, 3) the adequacy of internal controls to prevent fraud or unauthorized activities on the part of employees, and 4) the quality of oversight of risk management procedures provided by the board of directors and senior management. Once this assessment is completed, the bank supervisory agency should make sure that this information is disclosed to the public. By giving poor rankings to banks that are not up to speed on risk management, banking supervisors can make sure that best practice for risk management would spread throughout the banking industry in their country.[22]

6 Encourage disclosure and market-based discipline

There are two problems with relying solely on supervisors to control risk-taking by financial institutions. First, financial institutions have incentives to keep information away from bank examiners so these institutions are not restricted in their activities. Even if supervisors are conscientious, they may not be able to stop financial institutions from engaging in risky activities. Second, supervisors may give into political pressure or be corrupt and not do their jobs properly.

To eliminate these problems it would be better to have the impartial market discipline financial institutions if they are taking on too much risk. Disclosure

[22] More controversial is whether bank supervisors should recommend approaches to risk management. Barth, Caprio and Levine (2005) suggest that the answer is no because giving increased discretionary powers to supervisors has not led to safer and sounder banks for the reasons discussed in the subsection on strong discretionary supervisory powers.

from financial institutions about the state of their balance sheet and the riskiness of their activities allows individual depositors or other creditors to monitor these institutions and withdraw their money if the financial institution takes on too much risk.

Disclosure requirements have one important advantage over capital requirements. If bank capital requirements are set too low, they will have little impact. If set too high, banks may try to evade them. Disclosure of a bank's true balance-sheet position can help the market discipline banks by not providing the bank with funds if it does not hold an adequate amount of capital. Similarly, disclosure of the extent of bank lending denominated in foreign currency can help limit the degree of currency mismatch. Depositors and other creditors will be more wary of putting their money in a bank if it is has lent extensively in dollars to firms that have their products denominated in the domestic currency so that a currency depreciation will result in a surge in bad loans. In addition, disclosure about the riskiness of banks' other activities allows individual depositors or other creditors to monitor these institutions and withdraw their money if the financial institution takes on too much risk.

Because financial institutions are able to take on more risk than many conventional businesses and because they are typically provided with a government safety net, disclosure requirements need to go beyond the simple public issuance of conventional balance sheet and income statements. Governments need to hold bank directors and managers responsible for timely and accurate disclosure of a wide range of information on the quality of their assets, the amount of risk they are exposed to, and the procedures they use to manage risk. Recent evidence in Barth, Caprio and Levine (2005) indicates that disclosures of this type are the most effective tool in promoting a safe and sound banking system.

Two additional steps may also help increase market discipline. One would require that financial institutions have credit ratings. Part of the supervisory system implemented in Argentina in December 1996 was the requirement that every bank have an annual rating provided by a rating agency registered with the central bank.[23] Institutions with more than $50 million in assets were required to have ratings from two rating agencies. As part of this scheme, the Argentinean central bank was responsible for performing an after-the-fact review of the credit ratings to check if the rating agencies were doing a reasonable job. In addition, after January 1998, it was required that these credit ratings be placed on billboards in the banks as well as appear on all deposit certificates and all other publications related to obtaining funds from the public. The lack of a credit rating or a poor credit rating would make depositors and other creditors reluctant to put

[23] See Banco Central de la Republica Argentina (1997) and Calomiris (1998) for detailed descriptions of the Argentine regulatory system.

their funds in a bank, thus giving the bank incentives to reduce its risk taking and boost its credit rating.[24] The Argentine regulatory system worked extremely well in promoting a healthy banking system, until Argentina's fiscal difficulties led to destruction of the banking system.[25]

7 Allow entry of foreign banks

Many developing countries have laws that prevent foreign banks from establishing branches or affiliates in their country. Instead of seeing foreign banks as a threat, their entry should be seen as an opportunity to increase the stability of the financial system in general and the efficiency of the banking system in particular.[26]

Foreign banks have more diversified portfolios and also usually have access to sources of funds from all over the world through their parent companies. This diversification means that these foreign banks are exposed to less risk and are less affected by negative shocks to the home country's economy. Because many emerging market and transition economies are more volatile than industrialized countries, having a large foreign component to the banking sector is especially valuable because it can help insulate the banking system from domestic shocks. Encouraging entry of foreign banks is thus likely to lead to a banking and financial system that is substantially less fragile and far less prone to crisis. In fact, data show that countries that allow foreign bank entry have more stable financial systems and fewer

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[24] For a favorable assessment of the Argentine bank regulatory system before the crisis, see Calomiris and Powell (2001).

[25] Another way to impose market discipline on banks is to require that they issue subordinated debt (uninsured debt that is junior to insured deposits, but senior to equity). Subordinated debt, particularly if it has a ceiling on its the spread between its interest rate and that on government securities, can be an effective disciplining device. If the bank is exposed to too much risk, it is unlikely to be able to sell its subordinated debt. Thus, compliance with the subordinated debt requirement will be a direct way for the market to force banks to limit their risk exposure. Alternatively, deposit insurance premiums could be charged according to the interest rate on the subordinated debt. Not only would the issuance of subordinated debt directly help reduce incentives for banks to engage in risky activities, but it can also provide supplemental information to bank examiners that can help them in their supervisory activities. In addition, information about whether banks are successful in issuing subordinated debt and the interest rate on this debt can help the public evaluate whether supervisors are being sufficiently tough on a particular banking institution, thus reducing the scope of the principal-agent problem. A subordinated debt requirement does require that an emerging market country have sophisticated capital markets. However, Argentina did implement a subordinated debt requirement in its BASIC program, although without an interest rate cap, which took effect on January 1998. As reported in Calomiris (1998), initially about half of the banks were able to comply with this requirement. Interestingly, as expected, it was the weakest banks that had trouble issuing subordinated debt. Furthermore, banks that complied with the requirement had lower deposit rates and larger growth in deposits. Thus, the subordinated debt requirement looks like it has had the intended effect of promoting discipline on the banks (Calomiris and Powell, 2000). Calomiris (1998).

[26] See Levine (1996) and World Bank (2001) for a general discussion of the benefits of foreign bank entry.

episodes of financial crisis (Demirguc-Kunt, Levine and Min (1999) and Barth, Caprio and Levine (2005).

Another reason to encourage entry of foreign banks is that this can encourage adoption of best management and prudential supervisory practices in the banking industry. Foreign banks come with expertise in areas like risk management and are typically more efficient than domestic banks.[27] When bank examiners in a country see better practices in risk management, for instance, they can encourage the spread these practices throughout their country's banking system by downgrading banks who do not adopt these practices. Having foreign banks demonstrate the latest risk management techniques can thus lead to improved control of risk in the home country's banking system (Ross Levine (1996) Caprio and Honohan, (1999), and Mishkin, (2003).[28]

Encouraging the entry of foreign banks makes it more likely that a failed bank's uninsured depositors and creditors will not be bailed out.[29] Governments are far less likely to bail out the banking sector when it gets into trouble if many banks are foreign-owned because such a move will be politically unpopular (Kane, 2000). Thus uninsured depositors and other creditors will have greater incentives to monitor a bank's practices and performance and will withdraw their funds if it takes on too much risk. The resulting increase in market discipline is likely to encourage more prudent behavior by banking institutions: foreign banks provide higher provisions for potential loan losses and have higher recovery rates for loans that go into default (Crystal, Dages and Goldberg, 2001).[30]

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[27] Foreign banks have lower overhead costs than domestic banks than domestic banks and are thus able to operate with lower net interest margins (net interest income relative to assets) and still earn similar returns on assets. See Figure 10.5, page 133 in Inter-American Development Bank (2004).

[28] Levine (1996) and Caprio and Honohan (1999) point out that there are also benefits from the increased competition that foreign bank entry brings to the banking industry in the home country.because it leads to improved management techniques and a more efficient banking system.

[29] In addition, because foreign banks do not have the same political connections as domestic banks, foreign bank entry seems to reduce political influence peddling in the financial sector (Kroszner (1998) and Calomiris, Klingebiel and Laeven, (2003)).

[30] There are two concerns about the entry of foreign banks that seem unfounded. The first concern is that the entry of foreign banks might hurt small customers because it may cause the demise of small domestic banks that specialize in lending to small businesses and individuals. However, although when domestic banks in Argentina were first acquired by foreign banks, they did not initially focus on consumer, mortgage, or property lending, over time they did begin to enter these businesses aggressively, thereby lowering interest rates for consumers (Clarke, Cull, D'Amato and Molinari (2000)). A second concern is that foreign banks may be more likely to cut and run during a crisis and thus could exacerbate financial crises. However, the opposite seems to be the case in emerging market countries like Argentina and Mexico, where the presence of foreign banks has stabilized credit flows during crises (Goldberg, Dages and Kinney, 2000, and Clarke, Cull and Martinez Peria, 2001).

Making prudential supervision work

We would like to think that politicians and government official (the *agents)* work on behalf of the public (the *principals),* but this doesn't take into account human nature. The principal-agent problem occurs because agents (politician or government officials) have incentives to act in their own interest rather than in the public (principal's) interest. To act in the public's interest, prudential supervisors (and regulators) have to limit currency mismatch, restrict connected lending, ensure that banks have enough capital, make sure that banks don't take on too much risk and encourage disclosure. They also must not engage in regulatory forbearance, that is, allow financial institutions that are broke to continue to operate because it creates enormous incentives for banks to take on even more risk because they have almost nothing to lose. However, because of the principal-agent problem, prudential supervisors have incentives to do the opposite. Bankers in developing countries may bribe these government officials to allow banks to skirt prudential regulations, or get politicians to lean on the supervisors to weaken regulations or look the other way when banks are not complying with them. The principal-agent problem, which has led to inadequate prudential supervision, has not only been at the source of financial instability in emerging market countries, but also has led to banking crises in most of the advanced countries, including the United States.

What reforms can limit the principal-agent problem and ensure that prudential supervision will work?

1 Implement prompt corrective action

Quick action by prudential supervisors to stop undesirable activities by financial institutions and, even more importantly, to forgo regulatory forbearance and close down institutions that do not have sufficient capital, is critical if financial instability is to be avoided. An important way to ensure that bank supervisors do not engage in regulatory forbearance is implementing prompt corrective action provisions (first implemented in the United States in the 1991 FDICIA legislation) which require supervisors to intervene earlier and more vigorously to force financial institutions to either clean up their act or close them down if they are close to insolvency. Prompt corrective action is crucial to preventing problems in the financial sector because it creates incentives for institutions to take on less risk in the first place: they know that if they take on more risk, they will be closed down quickly when they get into trouble.

One key element in making corrective action effective is that supervisors must have an accurate assessment of the condition of the bank. Such accuracy is achieved by examining banks frequently and ensuring that they recognize their bad loans so that they are subtracted from the amount of capital on hand. It is particularly impor-

tant that banks be prohibited from "evergreening", a common practice in developing countries in which banks extend new loans to troubled borrowers who then pay back the old loan plus its interest with the new loan. In this way, the bank takes the old loan, which would otherwise be classified as non-performing, off its books and so does not have to record the loss and lower the value of its capital.

Not only must weak institutions be closed down, but closure must be done in the right way: Funds must not be supplied to weak or insolvent banking institutions to keep them afloat. The way to recapitalize the banking system is to close down all insolvent and weak institutions, and sell off their assets to healthy institutions. If getting healthy institutions to buy these assets is not possible, a public corporation, like the Resolution Trust Corporation (RTC) in the United States or KAMCO in Korea, can be created which will have the responsibility to sell off the assets of these closed banks. However, in order to put these assets quickly into productive use by the private sector, and so limit the losses, they need to be sold off as promptly as possible, as occurred in both Korea and the United States.

It is also imperative that the government make clear and then make sure that stockholders, managers and large creditors will suffer large financial losses when financial institutions are closed and public funds are injected into the financial system. If managers, stockholders, and large uninsured creditors expect to be bailed out by the government (often the case in developing countries) they will have tremendous moral hazard incentives to take on risk. If their bets pay off, they win big, and if the bets fail, the government will cover (at least partially) their losses.

Punishing the managers and owners of insolvent financial institutions is necessary to generate public support for committing sufficient funds to clean up the financial sector. In the United States, for example, owners of insolvent banking institutions such as savings and loans did incur substantial financial losses when they failed and sometimes were even thrown into jail aferwards. Such actions helped provide political support for the full clean up of the savings and loan and banking industry in the late 1980s and early 1990s. This rarely happens in developing countries, and even in advanced countries like Japan. The result has been that the public is often unwilling to support the injection of public funds into the banking system to get it fully back on its feet. In Japan, the public was outraged that owners of failed banking institutions (some of whom were criminal figures) got off scot free. The lack of political support for cleaning up the banking mess has been disastrous for Japan and is an important source of Japan's economic stagnation.

2 Limit Too-Big-To-Fail

Because the failure of a very large financial institution makes it more likely that a major, systemic financial disruption will occur, banking supervisors are

naturally reluctant to allow a big financial institution to fail and cause losses to depositors. The result is that most countries either explicitly or implicitly have a *too-big-to-fail policy* in which all depositors at a big bank, both insured and uninsured are fully protected if the bank fails.[31] The problem with a too-big-to-fail policy is that it increases the moral hazard incentives for big banks to take on excessive risk. Once large depositors know that a financial institution is too big to fail, they have no incentive to monitor the bank or pull out their deposits when it takes on too much risk. No matter what the bank does, large depositors will not suffer any losses. Because bank monitoring by depositors declines, banks are more likely to take on even bigger risks, making failures more likely.[32]

This problem is even more severe in emerging market countries because their financial systems are typically smaller than those in developed countries and so tend to be dominated by fewer institutions which are even larger relative to the size of the economy, increasing the likelihood that they will be considered too big to fail. Furthermore, the government connections and political power of large financial institutions is often much greater in emerging market countries, making it more likely that they will be bailed out if they experience difficulties. Indeed, other creditors and stockholders, as well as uninsured depositors, in many emerging market countries have been protected in many emerging market countries when large institutions have been subject to failure.

Limiting moral hazard that arises when financial institutions are too-big or too-politically-connected to fail is a critical part of prudential supervision in emerging market countries. To discourage large institutions from taking on excessive risk, prudential supervisors need to scrutinize them even more rigorously than smaller ones and, at a minimum, must allow shareholders and managers to suffer losses when these institutions are insolvent.

The same incentives clearly apply to non-financial companies if they are considered to be too-big-to- or too-politically-influential-to fail) by the government. Lenders, knowing that they are unlikely to be subjected to losses if a company gets into trouble, will not monitor the company and call in its loan if it is taking on excessive risk. In many emerging market countries, governments have propped up large and politically-connected companies when they suffer financial distress and this has been a source of increased risk taking by these companies, especially when they face difficult times. Indeed, the too-big-to-fail policy for the chaebols (conglomerates) was a key factor generating the financial crisis in Korea.

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[31] For an excellent discussion of the too-big-to-fail problem, see Stern, and Feldman (2004). Mishkin (2005b) indicates, however, that although the too-big-to-fail problem is important, it is not the dominant problem for bank supervisors, as the Stern and Feldman book seems to suggest.

[32] See Boyd and Gertler (1993), for evidence, that even in advanced countries like the United States, large banks take on riskier loans than smaller banks.

To eliminate incentives for the corporate sector to take on too much risk, too-big-to-fail policies must be eliminated for this as well as the financial sector. This implies a greater separation between the corporate sector and the government, something that requires a change in the business culture of many emerging market countries.

3 Give adequate resources and statutory authority for prudential regulators/supervisors

In many emerging market countries, prudential supervisors are not given sufficient resources or statutory authority (the legal ability to issue cease and desist orders and to close down insolvent banks) to do their jobs effectively. In close to 40% of developing countries, supervisors can be held personally liable for their actions.[33] In addition, their salaries are generally very low relative to those paid in the private sector. In India, for example, bank supervisors in the late 1990s typically had a salary of $3000 (plus some additional housing benefits), while a comparable position at the assistant vice president level in a private sector bank was paying $75,000.[34] While the problem of low public sector pay relative to the private sector exists in rich countries, it is far less severe. When I was an executive at the Federal Reserve Bank of New York, I worried that its employees could often double or triple their salaries by moving to the private sector, not increase their income by a factor of twenty-five!

Without sufficient resources and incentives, supervisors will not adequately monitor the activities of banks and their managers. Indeed, absence of sufficient monitoring of banking institutions has occurred in many emerging market countries, and in industrialized countries. For example, the U.S. Congress's resistance to providing the savings and loan supervisory agencies with the resources to hire an adequate number of bank examiners was a key factor in making the S&L crisis in the 1980s much worse.

Giving supervisors sufficient resources and statutory authority to do their jobs is thus critical to promoting a safe and sound financial system that is resistant to financial crises. Ruth Krivoy (2000), who was the president of Venezuela's central bank during its banking crisis in 1994 and saw the supervisory process in Venezuela from the inside has put it nicely by saying that supervisors in emerging market countries must be given "respect". If they are paid poorly, they will be more easily

[33] Barth, Caprio and Levine (2005) indicate that in their sample supervisors in one-third of all the countries are subject to lawsuits for doing their jobs and that the percentage is higher for developing countries. In private correspondence, Gerard Caprio informed me that 50 of 105 developing countries have their supervisors subject to lawsuits (38%) while this is true for only 15 of 45 industrialized countries (33%).

[34] These figures come from Barth, Caprio and Levine (2005), Chapter 2.

bribed either directly or through promises of high paying jobs by the institutions they supervise. Making supervisors personally liable for taking supervisory actions also makes it less likely that they will take the appropriate actions. Furthermore, if they do not have sufficient resources to monitor financial institutions, particularly in information technology, then they will be unable to spot excessive risk taking.

Adequate government funds for supervisors to close down insolvent institutions is also needed to make prompt corrective action work. Politicians and regulatory authorities often engage in wishful thinking when the banking system is in trouble and hope to avoid a large injection of public funds to save the banking system. Such regulatory forbearance allows insolvent institutions to keep operating with disastrous consequences.

4 Give independence to regulatory/supervisory agencies

Because politicians often lean on prudential supervisors to not do their jobs, the bank regulatory/supervisory agency must be sufficiently independent from the political process so that it will not be encouraged to sweep problems under the rug and engage in regulatory forbearance. Providing supervisory agencies with adequate resources also will help promote their independence. If supervisory agencies have to come hat in hand to the government for the funds to close down insolvent institutions, they will be more subject to political pressure to engage in regulatory forbearance. Supervisors must have adequate financial resources at their finger tips to prevent this from occurring.

5 Make supervisors accountable

Giving independence to prudential supervisors is not an unmixed blessing. The principal-agent problem indicates that supervisors will not always act in the public's interest. They not only have incentives to do the bidding of bankers and politicians and not enforce regulations to restrain bank risk-taking, but also have incentives to engage in regulatory forbearance and hide problems of insolvent banks and hope that the situation will improve, a behavior that Edward Kane (1989) has characterized as "bureaucratic gambling".

To improve incentives for them to do their job properly, supervisors must be held accountable if they engage in regulatory forbearance.[35] Opening up

[35] For example, as pointed out in Mishkin (1997), an important but very often overlooked part of the U.S.'s FDICIA legislation which has helped make it effective is that there is a mandatory report that the supervisory agencies must produce if the bank failure imposes costs on the Federal Deposit Insurance Corporation (FDIC). The resulting report is made available to any member of Congress and to the general public upon request, and the General Accounting Office must do an annual review of these reports.

the actions of bank supervisors to public scrutiny makes regulatory forbearance less attractive to them, thereby reducing the principal-agent problem. In addition, politicians will be less likely to lean on supervisors to relax their supervision of banks when the reasons for supervisory actions are visible to the public. To get supervisors to do their jobs properly, supervisors must also be subject to criminal prosecution if they are caught taking bribes and must also be subject to censure and penalties if they take jobs with institutions that they have supervised recently. In many emerging market countries, supervisors are allowed to get too close to the institutions they supervise and go to work for the institutions they have been supervising almost immediately after leaving the supervisory agency.

6 Strong discretionary supervisory powers may backfire

The new Basel Accord for bank supervision (known as Basel II) has strengthening of official supervision as one of its three major pillars. (The other two are minimum capital requirements and strengthening market discipline.) Giving supervisors stronger discretionary powers (such as forcing a bank to change its internal organizational structure, suspend dividends, stop bonuses, decrease management fees, remove and replace managers and directors, and so on) provide supervisors with a stick to force banks to comply with regulations and to constrain them from engaging in risky behavior.

However, giving supervisors these powers is beneficial *only* if they are acting in the public interest (that is, the principal-agent problem is small). In countries with a strong rule of law, an active free press that holds supervisors accountable for their actions, and relatively high wages for supervisors, supervisory powers are far more likely to be used in the public interest. What works well in rich countries with strong institutional environments, however, may not work in the weaker institutional environment found in developing countries. Instead of acting in the public interest and being a "helping hand", supervisors may instead act in their own interest and be a "grabbing hand". An important new book by Barth, Caprio and Levine (2005) uses a unique data base on bank supervisory practices throughout the world compiled by the World Bank to see whether supervisors act as a helping hand or a grabbing hand. In rich countries, supervisors generally help; in developing countries they generally grab. The statistical evidence suggests that in developing countries, strengthening the discretionary powers of supervisors has led to lower levels of bank development, greater corruption in lending, and banks that are less safe and sound. Following the Basel II recommendation of strengthening supervisory powers, then, may do more harm than good in developing countries, unless it is accompanied by substantial progress in institutional development.

Should we just throw up our hands and give up on prudential supervision in developing countries with weak institutional environments? Clearly not. Measures to make prudential supervision effective need to be high on policymakers agenda. But since instituting effective and accountable prudential supervision takes time, giving strong statutory powers to supervisors may have to be sequenced. For countries with weak institutional development, prudential supervision may need to focus less on telling banks what to do and more on encouraging market discipline by making sure banks comply with disclosure requirements: that is, make sure that information provided by financial institutions is both accurate and sufficient. Only when the institutional environment improves so that supervisors are accountable for doing their jobs properly, should supervisors be given discretionary statutory powers.

7 Get the government out of the banking business

We have already seen that because state-owned banks do not have the incentives to allocate credit to productive uses, a banking sector dominated by state-owned banks results in less efficient investment and slower growth. State-owned banks also weaken the banking system. The absence of a profit motive means that they are less likely to manage risk properly and be efficient. State-owned banks typically have larger loan losses than private institutions, and countries with the highest share of state-owned banks, on average, are also the ones with a higher percentage of non-performing loans and higher operating costs.[36]

The inefficiency of state-owned banks and their higher loan losses strongly argue for privatization of the banking sector. However, even privatization must be managed properly or it can lead to disaster. If purchasers of banks are those who are likely to engage in excessive risk taking or even fraud, the possibility that banking problems will arise in the future are high. Also if purchasers of banks are allowed to put in very little of their own capital into the bank (as happened in Mexico), then they may also have strong incentives to engage in risky activities at the depositors' and taxpayers' expense. If corporations are allowed to purchase banking institutions (as occurred in South Korea), they are more likely to make connected loans which in turn are more likely to end in default. The potential downsides of privatization do not indicate that privatization be avoided, but rather that the chartering or licensing process be sufficiently stringent to screen out bad owners and ensure that bank ownership goes to individuals who will improve bank performance over the previous government managers.

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[36] For additional reasons why the government should get out of the banking business, see Goldstein and Turner (1996), World Bank (2001) and Barth, Caprio and Levine (2005).

Managing the overall economy

So far I have outlined reforms which focus on the details of how to develop a financial system that is less prone to crises. But there is a bigger picture of how the overall economy needs to be managed to prevent financial instability.

1 Financial liberalization should be sequenced

Although deregulation and liberalization are highly desirable objectives, if this process is not managed properly, it can be disastrous. If the proper bank regulatory/supervisory structure, accounting and disclosure requirements, restrictions on connected lending, and well-functioning legal and judicial systems are not in place when liberalization comes, the appropriate constraints on risk-taking behavior will be far too weak. The result will be that bad loans are likely, with potentially disastrous consequences for bank balance sheets at some point in the future.

In addition, before liberalization occurs, banks may not have the expertise to make loans wisely, and so opening them up to new lending opportunities may also lead to loan portfolios of poor quality. Opening up to foreign capital inflows often leads to a lending boom, because of increased resources for bank lending and because it promotes financial deepening in which more funds flow into the banking system. Although financial deepening is a positive development for an economy in the long run, in the short run the lending boom may outstrip the available information resources available in the financial system and promote a financial collapse in the future.

The dangers in financial deregulation and liberalization do not imply that countries would be better off by rejecting a liberalization strategy. To the contrary, financial liberalization and globalization are critical to the efficient functioning of financial markets so that they can channel funds to those with the most productive investment opportunities. Getting funds to those with the most productive investment opportunities is especially critical to emerging market countries because these investments can have especially high returns, thereby stimulating rapid economic growth.

To avoid financial instability, policymakers need to put in place elements of a proper institutional structure before fully liberalizing their financial systems, especially if there are no restrictions on financial institutions seeking funds abroad or issuing foreign-denominated debt.[37] Crucial to avoiding financial crises are the precepts outlined above: limits on currency mismatch, restrictions on connected lending, requirements for adequate bank capital, an appropriate focus on risk

[37] Goldstein (1998) provides a strong argument for sequencing.

management, adequate disclosure and encouragement of market-based discipline, adoption of prompt corrective action, limits on too big to fail, provision of adequate resources and statutory authority to bank supervisors, independence of bank regulators/supervisors from short-run political pressure, increased accountability of bank supervisors, elimination of stateowned banks, and encouragement of entry of foreign banks.

There is an important counterargument to the view that the above reform measures need to be fully put in place before financial liberalization takes place. Because, as we have seen, powerful elites in emerging market countries often oppose reforms to improve the working of the financial system, many countries do not pursue reforms before they undertake financial liberalization. A staged approach may provide policymakers with an excuse for prolonging bad policy (Irwin, Gilbert and Vines, 2004). Politicians who benefit from status quo are willing to agree in principle to reforms, but emphasize practical difficulties. Sequencing arguments then may be little more than a ploy for attracting assistance without implementing difficult policies. Instead it is the opening up of the financial system that provides the impetus behind reform. In a study of financial liberalizations, Kaminsky and Schmukler, (2003) find that in only 18% of countries does the rule of law improve before financial liberalization, while it improves in 64% after the liberalization. This same study also found that financial liberalization is followed by more volatility in business cycles, but leads to more stability in the long run.[38]

Because financial liberalization may still be worth pursuing even if the necessary reforms are not already in place or because they take time to install and because of the stresses that rapid expansion of the financial sector puts on both managerial and supervisory resources, restricting the growth of credit when financial liberalization is put into place makes a lot of sense. Such restrictions can take the form of putting upper limits on loan-to-value ratios, or for consumer credit, setting maximum repayment periods and minimum downpayment percentages. Banks could also be restricted in how fast certain types of loans in their portfolios are allowed to grow. In addition, at the beginning of the liberalization process, restrictions on foreign-denominated debt and prudential controls that might limit capital inflows may be necessary to reduce the vulnerability of the newly-liberalized financial system. As the appropriate infrastructure is put into place, these restrictions then can be reduced.

The bottom line is that, although eventually a full financial liberalization is a worthy goal, to avoid financial instability financial liberalization may have to be phased in over time, with some restrictions imposed along the way.

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[38] A similar result is also found in Ranciere, Tornell and Westermann, (2005).

2 Fiscal policy should be reformed to prevent excessive budget deficits

Although most of the financial crises in recent years have been triggered by deficiencies in the financial system, the Argentine crisis of 2001-2002 demonstrates that even a prudential regulatory and supervisory system that effectively restricts risk taking may not be enough to prevent devastating crises if fiscal policy spins out of control.[39] Fiscal reform to ensure that this doesn't happen is thus another key to preventing financial crises in emerging market countries. Fiscal reform takes several forms.

First, provincial or state governments must not be bailed out by the central government when they can't pay their bills. Knowing that the central government will come to the rescue, the provinces (states) then have every incentive to overspend because they can put the burden onto the taxpayers in other provinces. This is just another manifestation of moral hazard and the free-rider problem at work, but in this case it applies to governments and not the private sectors. When provinces spend far more than their revenue and then go to the central government to fund their deficits, the central government will print money to pay the bills of the provinces (leading to hyperinflation), or it can lead to a default on the government debt which triggers a financial crisis. Both outcomes have occurred in Argentina.

Having a no-bail-out rule for state and local governments is therefore a critical reform for emerging market countries in which the consequences of high government fiscal imbalances can trigger a financial crisis. Alternatively, budget rules can be set up for state and local governments, preventing them from running large deficits. Indeed, this is exactly what the members of the European Monetary Union have done with their Growth and Stability Pact which limits member states to maximum budget deficits of 3% of GDP. However, as has become clear in Europe recently with France and Germany violating this limit, enforcement of budget rules of this type may not be easy.

Another necessary reform to keep fiscal imbalances from triggering crises is budget rules that increase transparency. Fiscal policy gets out of control in emerging market countries because the government's fiscal accounts are nontransparent. If the public has no idea what the government is spending – a clear cut information asymmetry – then it is hard for them to constrain politicians who can spend money on projects that reward their family, friends or constituents who will fill the politicians campaign coffers. Such "pork barrel" spending is not restricted just

[39] E.g., see Mussa (2002), Jonas (2002), De la Torre, Eduardo Yeyati, and Schmukler, (2003) and Chapter 7 of Mishkin (2006).

to emerging market countries, but occurs in advanced countries as well. There is typically far less transparency in emerging market countries, however, and this is why their fiscal problems are generally far worse.

Increasing transparency by eliminating numerous special accounts and consolidating all fiscal activities under one bottom-line measure that summarizes the total government budget situation is one step in this direction. In addition, fiscal rules, like balanced budget amendments, can be put in place to ensure fiscal responsibility. However, rules of this type can be manipulated and thus require a high degree of budget transparency to work. Also giving more power to chief executives or finance ministers to control spending can help to constrain the tendencies of different parts of the government to push their pet spending projects,[40] which otherwise would lead to large budget deficits.[41]

3 The monetary policy framework should promote price stability

It is important to recognize that monetary policy can play an important role in promoting financial stability. Price stability which entails a low inflation rate is a worthy goal in its own right. Not only do public opinion surveys indicate that the public is very hostile to inflation, but there is also strong evidence that inflation is harmful to the economy. Inflation, particularly at high levels, is found to be negatively associated with growth, while at lower levels, inflation is found to lower the level of economic activity, although not necessarily the growth rate.[42] Empirical evidence also indicates that price stability helps promote financial deepening, with all the benefits it brings, such as a lower cost of capital, higher economic growth and a reduction of poverty (Boyd, Levine and Smith (2001) and Kamil and Izquierdo (2004).

Our understanding of the causes of financial crises provides additional reasons why price stability is so important. When countries have a past history of high inflation, debt contracts are often denominated in foreign currencies (De Nicolo, Honohan and Ize, 2003, and Inter-American Development Bank, 2005, and Honig, 2003), a factor that makes the financial system more fragile because currency depreciation can trigger a financial crisis. Achieving price stability is a necessary condition for having a sound currency, and with a sound currency, it is far easier for banks, nonfinancial firms and the government to raise capital with debt de-

[40] Evidence that giving more power to chief executives or finance ministers to control spending produces better fiscal outcomes can be found in Alesina, Hausmann, Hommes, and Stein (1996) and von Hagen and Harden (1994).

[41] For further discussion of fiscal reforms, see Poterba and von Hagen (1999).

[42] See the survey in Anderson and Gruen (1995) and Fischer (1993), one of the most cited papers in this literature.

nominated in domestic currency. Israel, for example, went from above 50% dollarization of its bank deposits in the mid 1980s to less than 10% by the mid 1990s after a decade of achieving low and stable inflation and fiscal consolidation (Galindo and Leiderman, 2003). Thus another method for reducing an economy's dependence on foreign-denominated debt and thereby reducing currency mismatches and enhancing financial stability is the successful pursuit of price stability.

What reforms can help emerging market countries achieve price stability? The fiscal reforms mentioned above are key because if fiscal imbalances get too large, governments resort to printing money to finance their deficits, and inflation will take off. Indeed, the primary reason that emerging market countries often have such a bad historical experience with inflation is because they have so often pursued irresponsible fiscal policy. Central banks also need to be insulated from the political process because politicians typically focus on the short-run creation of jobs and often push central banks to pursue expansionary policy to create them. The result is that inflation rises, which harms the economy in the long-run and thus eventually hurts workers rather than helping them. Granting the central bank independence so that it can set monetary policy instruments without political interference can help it to focus on the longer-run goal of containing inflation. In addition, giving the central bank a mandate to pursue price stability as its overriding, long-run goal can provide more political support for the central bank to control inflation. Also, as I have advocated in a large body of my research (Mishkin, 1999, 2000a, 2000b, 2001, forthcoming, Mishkin and Miguel Savastano, 2001, Schmidt-Hebbel and Mishkin, 2002, Jonas and Mishkin, 2005, and Bernanke et al., 1999), having the government and the central bank commit to achieving an explicit numerical goal for inflation (an *inflation target)* can help anchor inflation expectations and increase the probability that the central bank will pursue the price stability goal seriously. The improved control of inflation and the resulting reduction of liability dollarization promotes financial stability.

4 Pegging the exchange rate can be dangerous

Pegged exchange rate regimes, in which the domestic currency is pegged to a foreign currency like the U.S. dollar, have often been used by emerging market countries to promote price stability. Although often successful in bring inflation down, pegged exchange rate regimes have been a common element in emerging market countries that have experienced financial crises. A pegged exchange rate regime appears to encourage liability dollarization, which makes the economy highly vulnerable to harmful effects from depreciation of the domestic currency. By providing a more stable value of the currency, an exchange-rate peg can lower the perceived risk for foreign investors and thus encourage capital inflows. Al-

though these capital inflows might be channeled into productive investments and stimulate growth, the presence of a government safety net and weak bank supervision can lead instead to excessive lending. An outcome of the capital inflow is then likely to be a lending boom, an explosion of non-performing loans and an eventual financial crisis.

A pegged exchange rate regime also can also make it easier for countries to tap foreign markets for credit and so make it easier for the government to engage in irresponsible fiscal policy because it is easier for it to sell its debt. Argentina again provides a graphic example of this problem: when its fiscal policy became unsustainable, it provoked a disastrous crisis that pushed it into a great depression.

Pegged exchange-rate regimes are subject to speculative attacks and if these attacks are successful, the collapse of the domestic currency is usually much larger, more rapid and more unanticipated than when a depreciation occurs under a floating exchange-rate regime. The pegged regime makes an emerging market economy especially vulnerable to twin crises, in which the currency collapse, destroys firms' and households' balance sheets, which then provokes a financial crisis and a sharp economic contraction. Countries exiting from pegged exchange rate regimes are more prone to higher-cost financial crises and large declines in output the longer the exchange rate peg has been in place (Aizenman and Glick, 2005, Eichengreen, 1999, and Eichengreen and Masson, 1998).

The dangers of pegged exchange rate regimes are so clear that most emerging market countries would be far better off avoiding exchange rate pegs and instead adopting a flexible exchange rate regime, in which the exchange rate is allowed to fluctuate on a daily basis. As the former First Deputy Managing Director of the IMF, Stan Fischer (2003), put it: "The adoption of flexible exchange rate systems by most emerging market countries is by far the most important emerging market crisis prevention measure ..." A flexible exchange rate regime has the advantage that movements in the exchange rate are much less nonlinear than in a pegged exchange rate regime. Indeed, the daily fluctuations in the exchange rate in a flexible exchange rate regime have the advantage of making clear to private firms, banks, and governments that there is substantial risk involved in issuing liabilities denominated in foreign currencies. Furthermore, a depreciation of the exchange rate may provide an early warning signal to policymakers that their policies may have to be adjusted to limit the potential for a financial crisis.[43]

Flexible exchange rate regimes do not prevent negative consequences of exchange rate volatility, because liability dollarization does not disappear entirely and a currency depreciation can still damage balance sheets and harm the econ-

[43] For additional criticisms of pegged exchange rate regimes, see Obstfeld and Rogoff (1995), Eichengreen (1996), and Levy-Yeyati and Sturzenegger (2003).

omy. Nevertheless, lightly burned fingers are better than death from conflagrations.[44]

The conclusion is that a pegged exchange rate regime, which is only backed up by a government announcement of the peg and not by a firmer institutional commitment is likely to increase financial instability in emerging market countries. This is why I have advocated in my academic writings the adoption of a flexible exchange rate regime for most emerging market countries, but with a strong commitment to controlling inflation with an inflation target.[45]

Pegged exchange rates are not always inappropriate, however, and advocacy of flexible exchange rate regimes can be taken too far. As Paul Volcker (1998), a former Chairman of the Federal Reserve has put it, "We still hear the siren song that somehow floating exchange rates will solve the problem. That seems to me a strange and sad refrain."

In emerging market countries whose political and monetary institutions are particularly weak and who therefore have a history of continual bouts of very high inflation, fixing the exchange rate relative to a sound currency may be the only way to break inflationary psychology and stabilize the economy. This consideration has driven some economists to suggests that there might be times when a strong commitment to a fixed exchange rate (either through a currency board or through full dollarization in which the country abandons its currency and adopts a foreign currency like the dollar as its money) might be necessary (Calvo and Reinhart, 2000, Mishkin and Savastano (2003) and McKinnon and Schnabl, 2004).

However, as I have argued above and in Mishkin and Calvo (2003), the choice of exchange rate regime, whether a fixed or flexible one, is likely to be of secondary importance to the development of good financial, fiscal, and monetary institutions in producing economic success in emerging market countries.[46] When countries have placed their hopes for institutional development on adoption of a particular exchange rate regime, as the Argentineans did when they adopted the Convertibility Plan, they have been sorely disappointed. Placing too much emphasis on a particular choice of exchange rate regime can actually be harmful because it may reduce the focus on pursuit of institutional reforms that are so critical to successful financial globalization, reforms such as improved bank and financial sector regulation, fiscal restraint, building consensus for a sustainable and predictable monetary policy, and increasing openness to trade.

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[44] This phrase was suggested to me by David Archer.

[45] See for example, Mishkin (1998, 2000a). I lean to the position taken by Goldstein (2002) who advocates flexible exchange rates, inflation targeting and prudential measures to limit currency mismatch.

[46] For a similar view that more focus needs to be on improving fundamental institutions rather than on exchange rate regimes, see de la Torre, Levy-Yeyati and Schmukler (2002).

5 Open up to international trade

Opening up to foreign trade is another measure that can not only make financial crises less likely, but also less severe. When a country experiences a sudden stop of capital inflows, it can no longer finance its net purchase of foreign goods and services and so must increase its net exports (the difference between its exports and imports). The value of the currency must then fall to increase the demand for exports by making them cheaper and decrease the domestic demand for imports by making them more expensive. In this way, net exports increase. When a country is more open to trade, exports and imports are a larger percentage of GDP, and net exports can more easily adjust for a given change in the exchange rate. When there is a sudden stop of capital flows, a country that is more open to international trade will have less downward pressure on its currency and will be more likely to avoid a currency crisis. In addition, an economy open to trade has more firms exporting goods and services that are priced in foreign currency. When a depreciation occurs, even if firms have debt denominated in foreign currency, the prices of the goods and services they produce rises in terms of domestic currency. When the domestic currency depreciates, the resulting rise in the domestic-currency value of firms' assets then offsets the increase in the foreign-currency denominated value of their debt so a depreciation has less impact on the balance sheets of domestic firms.

Trade openness, therefore, not only reduces the likelihood of a currency crisis, but also makes it less likely that a currency crisis will trigger a severe financial crisis. Empirical research bears this out. Countries that are more open to trade are less likely to experience currency crises and when they experience sudden stops of capital flows, the size of the output contraction is smaller (Calvo, Izquierdo and Talvi, 2003, Frankel and Cavallo, 2004, Frankel, 2005, Edwards, 2004a, 2005, and Desai, Foley and Hines, 2005). Trade openness has the desirable feature that it promotes financial development, which is so necessary for economic growth.[47] The fact that trade openness also makes financial crises less likely and less severe should make trade openness a top priority for developing countries.

How can the international community encourage emerging market countries to adopt necessary reforms

To harness the power of financial globalization, emerging market countries have a difficult task. We have seen that they have to adopt a number of reforms to get their financial systems to work properly. First steps involve developing strong prop-

[47] This is discussed more extensively in Chapter 3 of Mishkin (2006).

erty rights by strengthening the legal system and rule of law, reducing corruption, and improving the quality of financial information and corporate governance. But this is not enough. They further need to develop a prudential regulatory and supervisory system for their financial institutions that prevents financial instability. The list of reforms to accomplish this is long: limit currency mismatch; restrict connected lending, ensure that banks have plenty of capital and have good risk management; encourage disclosure and market discipline of financial institutions; implement prompt corrective action; limit too big to fail; give adequate resources and statutory authority for prudential regulators/supervisors, but make them accountable; get the government out of directing credit and the banking business; allow entry of foreign banks, reform fiscal policy to prevent excessive budget deficits; and adopt a monetary policy framework that promotes price stability.

Implementing these reforms in emerging market countries is a long hard path and there are powerful forces that work to block reform. Business elites in emerging market countries benefit from such practices as connected lending, which provides their businesses with cheap sources of finance. They also want weak prudential regulation and supervision of banks they own. Again, globalization can help. As pointed out by Rajan and Zingales (2003), globalization increases competition, which weakens domestic elites who often block reforms and regulations that make the financial system safer and work better. Globalization also promotes domestic industries that require more capital, who have an interest in reforming the financial sector so that financial crises become less likely. Globalization thus needs to be seen in emerging market countries as an important driver of needed institutional reforms.

But how can the international community help? This is a complex topic that I discuss extensively in Mishkin (2006),[48] but I will touch on it briefly here. The key is to provide the right incentives to encourage institutional development in emerging market countries.

Currently, the IMF and the World Bank typically find it hard to deny loans to governments in the less-developed world that misallocate the funds or refuse to develop the institutions that are needed to make the nation's economy successful. The inability to "just say no" creates exactly the wrong kind of incentives for ill-run nations. Money should be used as a carrot to help poorer countries develop good institutions. If a government in one of these countries is unwilling to do this, it must be cut off. The IMF and the World Bank must learn to just say "no". This sounds harsh, but it is better to engage in "tough love" rather than to encourage countries to go down the wrong path.

The international financial institutions such as the IMF and World Bank and other governmental organizations in the rich countries (like the G7) have also

[48] Especially in chapters 11 and 12.

had a tendency to impose institutions on less-developed countries patterned after those that have worked well in advanced countries. Furthermore, the international financial institutions and governments in the advanced countries have often pushed standard "one size fits all" prescriptions for lessdeveloped countries such as complete abolition of capital controls. The IMF is greatly resented in the less-developed world, because the standard prescriptions often do not work and also have a strong element of hypocrisy because many of the prescriptions imposed on the less-developed countries are not followed by the rich countries.

The international financial institutions can help in several ways. Although less-developed countries need to develop their own institutional frameworks to make globalization work, there is a lot of expertise in institutions like the IMF and the World Bank that these countries could draw on. Technical assistance from these organizations can thus be of great value and indeed has been, as occurred in South Korea after their financial crisis. The right incentives from the international financial institutions can also help encourage elements in the less-developed countries overcome special interest who may block good institutional development.

But what can advanced countries do to help promote institutional development? The answer is opening up our markets to goods and services from emerging market countries. By so doing, rich countries can provide exactly the right incentives to promote institutional reforms that will improve the functioning of financial markets. If firms in emerging market countries have access to foreign markets, their increased need for capital means that they will demand that the legal system be better at enforcing property rights and financial contracts that will enable them to borrow. Similarly these growing, exporting firms will want to see improvements in the availability and quality of information because fewer asymmetric information problems will make it easier for them to get loans. They will also be more supportive of improvements in prudential supervision since a more efficient banking system can be a source of credit. Thus opening up the markets in the advanced countries to emerging market countries is the single most valuable thing the developed world can do to promote the financial reforms. In turn, financial reforms can increase financial deepening and help allocate capital to its most productive uses.

More open trade with emerging market firms can also help promote financial stability and reduce the likelihood and severity of financial crises in emerging market countries by increasing the size of the export sector in these countries (Calvo, Izquierdo and Mejia, 2004, Calvo, Izquierdo and Talvi, 2003, Calvo and Talvi (2005), Edwards, 2004a,b, Frankel and Cavallo, 2004). Having debt denominated in foreign currency makes firms more vulnerable to currency depreciations when the goods they produce are sold primarily in domestic markets and so are priced in the local currency. Under these circumstances, a domestic currency depreciation increases the value of their foreign-currency denominated debt in terms of

the local currency, while the domestic currency value of their output remains unchanged. The discrepancy between the increase in what they have to pay on their debt (liabilities) and what their product sales will bring in (assets) is what destroys their balance sheets. However, if the firm is selling its goods abroad, when there is a depreciation, the demand for the goods they produce rises in terms of local currency, so that the value of their production goes up, thus compensating for the increased value of the debt. When an emerging market country's export sector is larger, it is less vulnerable to a financial crisis because a currency depreciation will do less damage to the balance sheets of firms. Indeed, one of the reasons why Argentina was so hard hit by the collapse of its currency in 2001 was that it had such a small export sector.

Concluding remarks

Is making financial globalization work for emerging market countries without causing financial instability easy to accomplish? Far from it. It is extremely difficult because it requires development of institutions that took advanced countries a long time to develop. Furthermore it requires getting the political process in poor countries to support institutional reform.

This paper does not come up with easy answers to getting globalization right and promoting financial stability. Globalization and promoting financial stability requires hard work on the part of emerging market countries. All that we can do in the advanced countries is to provide incentives to encourage businesses, policy makers, politicians and ordinary citizens to support the kind of institutional development that will promote economic growth in poor countries. Opening up our markets to emerging market countries is the single most valuable way that the international community can help emerging market economies become successful. Although providing more aid to poor countries seems like a good way to stimulate growth an eradicate poverty, it rarely works. It usually does not create the right incentives to promote economic growth (Easterly, 2001). International financial institutions like the IMF and the World Bank can also help by providing technical assistance and incentives to pursue financial reforms by providing funds to countries that are serious about developing and supervising their financial systems, while denying funds to those countries that are not.

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Commentary on "Financial stability and globalization: getting it right"

Erkki Liikanen
Suomen Pankki

On the paper

Mishkin provides a very insightful and comprehensive paper on potential pitfalls in financial liberalization and globalization, and discusses policy responses to well-manage such a transition – both macro (monetary, fiscal and trade policies) and microeconomic (legal system, corporate governance, information disclosure, financial supervision). On these policies, there is both a balanced account of the literature and some recommendations in the paper (and one can agree with most of them). The paper mostly deals with developing countries.

While liberalization and globalization are needed for supporting financial deepening (ending repression due to intrusive regulations and capital controls), an almost immediate consequence in several countries was a period of severe financial instability or a full-blown financial crisis. The high cost of these crises makes their prevention and effective resolution a policy priority.

Such a development from liberalization to a crisis is in the backdrop of the paper – obviously – but the paper does not really describe the events so far. (Such a systematic description could make the paper more complete and pointed).

"Anatomy" of crises since early 1980s

There is striking amount similarity in the past crises, even though details of the crises may differ. Most of the financial crises experienced since the early 1980s followed a fairly standard (while not necessarily predictable) pattern of *deregulation, lending boom, asset price booms* (foremost real estate or share prices), *business cycle and asset price shocks, and large-scale bank failures (due to credit risk – i.e. bad debts) and – eventually – a financial crisis.* Crisis was usually triggered by

an *external shock* (e.g. unforeseen recession or exchange rate collapse). Crisis resolution was often similar as well. Insolvent banks were either temporarily nationalized or forcibly merged, after separating "bad loans" in a state agency. In some cases, a blanket government guarantee was also given that all financial institutions would meet their obligations.

Examples of similar crises include the crises in Latin America (Argentina, Mexico in early 1980s), the US Savings and loans institutions' crisis (early 1980s), and the three Scandinavian banking crises (Norway, Finland, Sweden in early 1990s). The crises in emerging market economies in late 1990s (Korea, Philippines etc.) also reflected the same pattern, by and large.

The *Finnish crisis* fits well with the major source of instability highlighted in the paper: the danger of accumulating indebtedness in foreign currencies and the resulting currency mismatches in the closed sectors of the economy (while not necessarily on banks' books). Once the Finnish currency depreciated heavily after its flotation, many firms could no longer repay their debt and banks' accrued vast amount of credit losses.

Four viewpoints for discussion

The points below are suggested as complements to the paper – not necessarily as points of disagreement (even though these elements are missing or hidden in the paper):

1 *Financial globalization raises difficult issues related to supervision and crisis management of cross-border and cross-sector financial institutions;*
2 *Focus also on the quality of supervision by developing risk-based approaches (not only on the institutional framework);*
3 *Avoid rigid policy solutions (one-size-fits-all) for all countries with different circumstances;*
4 *The next crisis could result from different risks and require different preventive or resolution measures.* We should be prepared to prevent and handle future crises not the past ones.

1 Financial globalization raises difficult issues related to supervision and crisis management of cross-border and cross-sector financial institutions

The paper argues, rightly, that opening up the domestic markets to foreign financial institutions may promote higher-quality domestic regulation and supervision by, inter alia, putting pressure on the domestic government to make reforms

that will make the financial system work more efficiently. However, as is well-known, big market shares of foreign-owned banks in many small countries create potential problems for both prudential financial supervision and the maintenance of financial stability in those countries.

One of the key issues in the international regulatory debate is how to divide the tasks, powers, and responsibility between different countries in supervising cross-border financial institutions and dealing with these institutions in financial distress. In the EU, the division of tasks, powers, and responsibilities is currently based on home-country control. The home country is responsible for supervising financial institutions that are headquartered in that country and its foreign branches. Foreign subsidiaries, on the other hand, are supervised by the host country supervisor. The home country supervisor, in addition, is responsible for the consolidated supervision of the financial group.

It seems likely that when the home-country responsibility principle applied in EU for supervising cross-border activity was drawn up, the expectation was that financial institutions´ cross-border and cross-sector activity would be small and that multi-country institutions would operate in other markets through subsidiaries. In that kind of world, the current regulatory design was sufficient.

Today, the reality is very different. Financial institutions cross-border and cross-sector activities are increasing at fast speed. Currently, for example, there are at least over 40 banks and banking groups that are active in more than three EU countries. In addition, financial institutions increasingly work along global business lines and less along national borders. For financial groups which are expanding cross-border a part of synergies is derived from centralizing functions along business lines, not necessarily along country borders. Concerning the legal form of banks´ foreign operations, the relative importance of banks´ foreign branches (as opposed to that of foreign subsidiaries) is likely to increase substantially as banks start to take advantage of the European Company Statute and operate as a single entity. As illustrated by these changes, the current and future European banking market is very different from that in which role of banks´ cross-border and cross-sector operations and banks´ foreign branches was negligible.

The problem of the current set-up is the gap, on the other hand, between the legal powers and mandates and, on the other hand, the abilities and responsibilities of the home and host supervisors. This gap becomes a problem once there is a financial institution that is systemically relevant in a host country. There are many kinds of potential conflicts of interest and coordination problems between home and host countries in dealing with the supervision, crisis management and crisis resolution of such institutions. The problems are starkest in the event of a crisis in the banking group, as all national authorities have a clear mandate to protect only their depositors and systems. In particular, if the institution´s presence in the host country is a branch, it is the home country supervisor who is

responsible for managing a crisis. Although the branch can systemically important in the host country, all its authorities can, to put it bluntly, do is to hope that the home country authorities take the interests of host country into account when dealing with the crisis.

It is clear that because of integration, the EU´s current regulatory set-up will be under increasing pressure in the future. Therefore, it is not a surprise that various alternative models to the current home-host set-up have been presented. The alternatives range from considerably strengthening the role of the home supervisor (lead supervisor model) to creating a European Financial Supervisor with full supervisory powers over branches and subsidiaries of cross-border banks. However, despite the pressures, the EU is likely for the time being to stick to the current European supervisory principles and structures and try to improve the functioning of the current regime by, inter alia, increasing supervisory cooperation and convergence of supervisory methods. Time will tell whether the current set-up will be sufficient.

A thorough discussion of the European supervisory arrangements would require a separate presentation. In this context, it might be sufficient to say that the financial globalization raises very challenging issues related to the supervision of cross-border and cross-sector financial institutions. These issues, in addition to those presented in Mishkin´s paper, should be addressed in any regulatory reform agendas.

2 Focus also on the quality of supervision by developing risk-based approaches

An appropriate institutional framework (deposit insurance, disclosure regime, property rights, independence and accountability of supervisors etc.) is clearly a prerequisite for well-managing liberalization and preventing crises. However, *one of the biggest lessons from the crises (also from the Finnish one) is that banks' risk management and supervisory practices were not yet developed enough to address the risks in the new environment.* This resulted in uncontrolled risk taking by banks as such risk taking was made possible by the liberalization. Mishkin discusses as a central issue the need to put in place proper institutional setting (foremost supervision) *before* liberalization, but does not spend space on the issue of the *quality of supervision.*

Before the crises, supervision was (and can still sometimes be) mostly legalistic checking of compliance with current regulations, rather than focused on risks. But *risk-based* supervision is at the core of having preventive (i.e. forward-looking) supervision rather than responding to problems when it is already too late. This is an issue of both *supervisory culture and resources* (a large enough number of qualified risk analysts working as supervisors).

What is needed is *a systematic plan to develop risk-based supervision,* which – one should acknowledge – takes many years to institute in a supervisory authority. Even developed countries have further efforts to make in this area.

A key element of such a plan is to put emphasis on *institutions' own risk management,* as risks are getting so complex and fast moving that they cannot be observed real-time by supervisors, or prevented through simple supervisory limits. However, this needs to be coupled by *adequate capacity of supervisors* to form their own judgment of the supervised entity's internal risk controls and major risk positions. Independent supervisory assessment is needed to prevent moral hazard and to avoid problem institutions from shifting risk to the government. Basel II reform supports this development by instituting a regular supervisory risk review (which is the second Pillar of the Basel package).

3 Avoid rigid solutions (one-size-fits-all) for all countries

Policy measures need to be adjusted to individual countries' circumstances (economic structures and development stage, financial system structure, political systems etc). While lessons on policy mistakes from the crises can be (reasonably) clear, this does not mean that a simple recipe can prevent future crises, or represent otherwise suitable policy options in all circumstances.

The paper does not advocate uniform solutions very strongly; in general it is quite balanced. It only has this flavor at instances. Some examples are below. (International institutions (IMF, World Bank) can have a stronger tendency for one-size-fits- all recommendations).

— *Floating exchange rates* (recommended with caveats in the paper) can be more stabilizing than fixed and allow using monetary policy to cool down fast credit growth. However, a currency board (such as in Estonia for example) could be a good option for "importing" monetary policy and bringing down inflation.

— *Deposit insurance* is often recommended (by World Bank, IMF and in the paper) to be avoided, at least by less institutionally developed countries because of moral hazard and increased risk taking by banks. However, deposit insurance can be a commitment device for governments to rescue only depositors and not other creditors of banks, and thus to support market discipline[1]. Without deposit insurance the true policy adopted in a crisis can be a blanket guarantee for all bank creditors. Market discipline is only possible when some creditors have their money at stake (with some positive ex ante probability) in a crisis. Disclosure of information is needed, but it does not generate market discipline unless the previous condition is met. Hence, explicit and limited deposit insurance – ex-

[1] See Gropp, R. and J. Vesala (2005) "Deposit Insurance, Moral Hazard and Market Monitoring", European Review of Finance.

plicitly protecting depositors only and leaving out other creditors – could be a step forward especially in a country (like Scandinavian countries in late 1980s/early 90s) with a history of blanked guarantees and weak market discipline. Explicit deposit insurance also needs to be coupled with effective supervision to cub any moral hazard effects.

— *Stringent (and simple?) regulatory capital requirements* are recommended (in the paper) for banks in less developed countries. However, a large and simple requirement (such as a leverage ratio) would not support the development of banks' own risk management – and ability to function in a liberalized environment – as it is not risk-based. On the other hand, advanced aspects of the highly risk-based Basel II may not be feasible due to lack of expertise and data in banks, but nothing prevents from *gradually moving towards a more flexible and risk-based approach* in less developed countries (where Basel II is not obligatory and its timing is not pre-specified like in Europe). One could implement e.g. the standard Basel II model for sovereign and bank counterparties based on external ratings and thus avoid the present low risk weight on government bonds under Basel I. Advanced methods for calculating capital charges for firms and households could and should be adopted only over time with more experience in banks and the supervisory authority.

— *Limiting currency mismatches* (recommended in the paper) in closed sectors of the economy would only be feasible by limiting foreign currency-denominated borrowing. This would be canceling liberalization, actually, so other indirect measures should probably be considered. What those measures could be will depend on the local tax system (possibility to use taxes to curb lending growth), monetary policy etc. This is an actual issue for many New Members States of the EU with high credit growth, often in foreign currencies.

4 The next crisis could result from different risks and require different preventive or resolution measures

The past crises were mainly due to credit risk and were national in scope. While credit risk often still is the most important risk for banks, the structure of the financial system has been changing in a profound way and the next crisis could come from a different source.

First, a rapid increase in banks' and other financial institutions' (e.g. insurance companies and pension funds) financial market-related activities has heightened their exposure to financial markets (and counterparty risks to other market players) and earnings sensitivity, suggesting that financial instability may increasingly result from *market instability.* This refers to equity, bond and derivative markets as

distinguished from more traditional exposures of banks to real estate price and exchange rate movements. Market activities also often entail a greater degree of operational risk (Barings' case for instance).

Second, the past separation between financial institutions and markets has been replaced by an increasing integration of markets and banks, as well as between banks and other financial institutions. Hence, *systemic risks could result from non-bank financial institutions* (such as hedge funds, private equity funds etc.), at least to the extent that major financial institutions are exposed to them.

Third, *liquidity conditions and contagion risks* play an increasingly important role due to the rapid increase in financial markets' activities and banks' increased reliance on market sources of funds.

Fourth, *internationalization of the financial system* has spread rapidly. Capital controls and restrictions on cross-border bank operations have largely been eliminated. National markets can no longer be viewed as isolated entities, but tend to be embedded in a complex system of interlinks. This holds true especially for EU countries due to the Single Market and spreading of cross-border banking, but also globally and for many developing countries as well, because in their financial systems international banking groups can play an important role. In New EU Members States the ownership of foreign banks in the local banking system is 70-100%.

Policies and measures taken to foster financial stability must take into account these developments in case of both developed and developing economies. Failure to upgrade policies to mach financial system developments can be very costly as the previous lessons show.

Rightly so, *many relevant new issues* are increasingly debated internationally. Listing a few of them (without analyzing them here) shows that the list of relevant issues goes much beyond those that can be easily handled in a single paper:

- Is there too much concentration risk in international financial markets (e.g. in may derivatives) causing clusters of counterparty risks? How should these risks be addressed by regulators?
- Should currently unregulated non-bank financial firms, such as hedge funds, be regulated, or is it enough to focus on banks' counterparty risks?
- How to analyze and reduce contagion risks effectively?
- Is the role of central banks heightened in financial crises resolution due to the increased importance of liquidity?
- How to manage crises in cross-border financial institutions?
- How to supervise effectively cross-border institutions, of financial conglomerates that span many financial activities?

Commentary on "Financial stability and globalization: getting it right"

Malcolm D. Knight
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The first years of the twenty-first century resemble closely those of the twentieth. We are living through the second wave of economic globalisation, and we have been enjoying an era of remarkable growth in productivity and income levels in many countries. But despite the promise of eternal prosperity that seemed to be offered by the previous era of globalisation, it did eventually end, first interrupted by World War I and later in the throes of the global Great Depression that followed the "roaring twenties".

That long ago experience should continue to keep us alert and humble. Alert, so that we do not take this current period of prosperity for granted, but instead work actively to safeguard it. Humble, so that we do not fall into the trap of thinking that we have finally found the answers to the fundamental economic questions with which the world confronts us. Globalisation is a market-driven process boosted by technological advances and the "animal instincts" of entrepreneurs. But, unlike technological change, globalisation is not unidirectional or inevitable; ultimately it hinges also on political decisions. And those decisions in turn are shaped, to a considerable degree, by the extent to which we can use them to harness the forces of globalisation so as to increase their benefits and reduce their costs.

In fact, the present wave of globalisation exhibits all the dynamism, but also some of the excesses, that were found in the process of capitalist transformation at the turn of the twentieth century and in the 1920s. Seen in this light, Frederick Mishkin's paper is a very useful compendium of all the things an emerging market country needs to do to embrace globalisation – to catch this wave, if you like, without being drowned by it.

In my remarks, taking my cue from Mishkin's paper, I would first like to stress some of the dilemmas that countries face when seeking to embrace globalisation. Then I will provide some reflections on the challenges ahead for central banks, focusing on the relationship between monetary stability and financial stability.

And – I have to say in the spirit of humility – I will be raising more questions than providing answers.

1 Globalisation and institutional reform: lessons learned

Let me first highlight, without much elaboration, three crucial points on which I agree entirely with Mishkin.

1 Embracing globalisation is a highly desirable goal. The enormous benefits it brings in terms of resource allocation and long-term growth potential are well known. I also agree with Mishkin that a key under appreciated benefit is the fact that globalisation is a vital catalyst for implementing domestic structural reforms that are desirable in their own right. In a nutshell, being able to sustain the challenges of globalisation is an unmistakable "signal" of institutional maturity.
2 Being able to enjoy the benefits of open financial borders does require the presence of broad-ranging institutional underpinnings: putting them in place is a major challenge that cannot be achieved overnight. Mishkin's paper lists them in detail. They range from property rights and legal systems, through adequate prudential regulation and supervision, to sound macroeconomic policies, monetary and fiscal.
3 Institutions that work well in particular countries at a particular stage in their development need not always be well suited to other countries or other times. This reflects, in part, different legal, cultural and historical traditions, and, in part, sequencing issues. The proper sequencing of the move to globalisation is idiosyncratic; it is country specific. Mishkin again provides several examples. I would highlight, for instance, that the Basel Committee on Banking Supervision has for some time emphasised, in its Core Principles for Effective Banking Supervision, the legal and institutional preconditions that need to be in place in order for regulation and supervision, and hence instruments such as commercial bank capital adequacy standards, to be effective.

From these three points, however, several dilemmas follow, which I think could have been highlighted more in Rick Mishkin's paper. They result in challenging trade-offs.

1 There is a "Catch 22" regarding the link between institutional reform and globalisation – and I am thinking particularly of financial globalisation

here, but not necessarily only of emerging market economies, as the experience in some industrialised countries has shown in the past. Waiting for all the preconditions to be in place obviously slows the pace of their adoption, given that openness is a catalyst for change. But not waiting until all preconditions are in place is quite likely to lead to costly episodes of financial stress.

The implication is that, particularly for emerging market economies, the process of embracing globalisation is bound to be either very long or quite painful. Since the early 1990s, we have been fortunate – so far – that the financial crises that have occurred have been used by a large number of countries to strengthen their institutional and policy frameworks rather than to retreat into isolationism. Just think of the macroeconomic and structural reforms that emerging market economies in East Asia undertook following the Asian financial crisis, as reflected in the widespread improvements in their credit ratings since the crisis broke out in 1997. Indeed, history seems to show that it took a crisis at the core of the global economy – in the United States and in the other industrial countries – rather than just at the periphery, to throttle and then reverse the previous globalisation wave of the early twentieth century.

This consideration puts a premium on efforts by the international community to enhance the process of structural change to embrace globalisation. Ultimately, progress can only be based on enlightened self interest and a sense of ownership of the reforms.

2 There is a clear tension between the call for uniformity demanded by the global capital marketplace and country-specific circumstances: this is a hard call to make. Think, for instance, of the nuances between principles-based accounting and rules-based accounting, or of the delicate balancing act in developing generally applicable best practices for corporate governance. Or recall the obvious difficulties major banks face in many countries in adopting the more advanced variants of Basel II.

To my mind, all this puts a premium on soundness over uniformity per se, and on patience over haste. I therefore fully endorse the view taken by the Basel Committee and the international financial institutions, for instance, that countries should adopt Basel II only when ready, even though this naturally complicates cross-border issues.

3 Judging the state of readiness of a country to liberalise and open up its markets has proved extremely difficult. How many times have countries thought they were ready to liberalise and open up, only to be proved wrong? Crises have often appeared inevitable only ex post. If memory serves me right, Mexico had been upgraded by the rating agencies just before its 1994 financial crisis broke out. And in Asia by the mid-1990s

fiscal probity, high investment levels and low inflation had been thought to insulate the region from difficulties. We should not, therefore, be lulled into a false sense of security; rather we should redouble efforts to strengthen institutional underpinnings.

2 Central banks: some certainties and one open question

I have not yet said anything about central banks. However, they clearly have a key role to play in strengthening the institutional set up. They are guardians of payment and settlement systems, repositories of financial know-how, responsible for monetary policy and, where relevant, in charge of financial supervision. Here, let me just highlight two certainties and one open question.

First certainty

Financial stability is a very complex task: central banks are an important, but by no means the only, player. Moreover, in a number of countries certain key financial stability responsibilities have been transferred to other agencies, notably in the prudential area. This makes it all the more important for central banks to retain influence, based on their know-how and competence, and to intensify their cooperation with other authorities nationally and internationally. This would help strengthen to further the macro-prudential, as opposed to micro-prudential, orientation of current efforts to secure financial stability. The establishment of international fora like the Financial Stability Forum, in which central banks play a prominent role alongside prudential regulators and ministries of finance, has been a step in the right direction. At the BIS we have been working hard to support such analytical and operational cooperation. The fact that the Basel Committee now reports to a joint group of central bank Governors and Heads of Supervision is one concrete such example.

Second certainty

Even more important, over the longer term and from a macroeconomic perspective, securing sustainable price stability is the best contribution that central banks can make to financial stability and to successfully embracing a globalised world. Countries have learned the hard way the enormous economic and social costs of inflation during the historically anomalous 'Great Inflation' era of the 1970s and early 1980s. Conversely, looking further back, the Great Depression was marked by a very painful, if historically equally anomalous, precipitous price *deflation.*

The open question

However, is whether we have indeed fully learned the lessons from the past. To be intentionally provocative, a stylised lesson that I draw from the past is that focusing exclusively on *short-term* inflation control, over a one-to-two year horizon, and paying only limited or no attention to monetary and credit aggregates, is not sufficient to ensure monetary and financial stability over the *longer term.* The political economy of a number of inflation targeting regimes, in which short horizons help to strengthen accountability, has favoured such a shift. Rick's paper discusses this issue in the context of financial liberalisation in individual emerging market economies, but not the risks in the dynamics of globalisation as a whole.

Why do I say this?

First, history indicates that short-term inflation control is not sufficient to prevent the emergence of macroeconomic instability. Inflation, for instance, did not rise to any significant degree during the run-up to the Great Depression in the 1920s or of Japan's 'lost decade' of the 1990s. Nor was it a problem in the run-up to the Asian crisis of 1997–98. And, indeed, looking back to the late nineteenth century Gold Standard period, financial crises were typically not preceded by rising inflation.

Second, some of the most serious mistakes in the history of monetary policy implementation were the result of not paying sufficient attention to money and credit expansion. The episodes I have just highlighted were indeed preceded by unusually strong cumulative expansions in "liquidity", broadly defined, typically alongside equally unusual increases in asset prices, not least those of real estate. The same is true for the Great Inflation. And on the downside, failure to focus sufficiently on the contraction in such aggregates certainly contributed to the depth of the Great Depression in 1931-33.

Third, recent formal empirical evidence, including research carried out at the BIS,[1] has confirmed this observation. In particular, it has found that unusually strong cumulative expansions in credit aggregates alongside similar increases of asset prices herald serious financial stress, economic weakness, and disinflation beyond the one-to-two year horizons common in monetary policymaking.

My final observation is that all of this acquires greater significance at the current juncture. The world economy has been experiencing, and may now be emerging from, an unusually long period of historically low inflation-adjusted policy interest rates, unusually strong expansion in global liquidity, exceptionally buoyant asset prices, and strong global growth. And this has occurred at a time

[1] See "Asset prices, financial and monetary stability: exploring the nexus", BIS Working Paper 114 by Claudio Borio and Philip Lowe and "Securing sustainable price stability: should credit come back from the wilderness?", BIS Working Paper 157 by Claudio Borio and Philip Lowe.

when globalisation should, if anything, have raised the world's natural interest rate, by boosting global growth potential while helping to keep a lid on inflation. But just because inflation has remained remarkably quiescent so far, should we assume that all is fine?

I say this in that spirit of humility which should underpin all policies. We must always remain alert and avoid complacency. The major policy mistakes in history that I highlighted earlier were made precisely when policymakers felt they had finally come to master the secrets of the economy. Preserving macroeconomic and with it, financial stability, is essential. We should not forget that it was financial stress at the core of the global economy, and its international ramifications, that proved fatal to the first wave of globalisation. I certainly do not have the answers. But these questions are worth asking.

Commentary on "Financial stability and globalization: getting it right"

Guillermo Ortiz
Banco de México

Introduction

I would like to make comments along two lines. First, I will briefly describe the financial and economic reforms that have taken place during the last decade in Mexico, and which have succeeded in delivering macroeconomic stability.

Second, I would like to make some remarks on the challenges that financial globalization poses to host-country authorities. Almost everyone agrees on the gains derived from globalization and the benefits that foreign investment brings to recipient countries. The benefits are well described in Mishkin's paper, along with a series of recommendations for success in the process of financial globalization. What not everyone recognizes, however, including Frederick in his paper, are some of the challenges that come along with the globalization of financial markets and institutions. Hence, I would like to briefly describe the challenges on five counts:

1 Competition in host-country financial markets
2 The soundness of local banks
3 Market discipline
4 The impacts of foreign regulations on domestic financial markets
5 The resolution of troubled global banks

Mexico's reform effort

The depth of the Mexican 1995 banking crisis made it clear that the incentives faced by financial-system participants were not correctly aligned. The combination of financial deregulation, the unprecedented availability of resources for lending to

the private sector, the absence of a risk management culture combined with a lack of experienced bankers after years of government-run banks and a weak supervisory framework, resulted in severe problems in the banking system. The current account imbalances, fixed-exchange rate regime, and the instability that characterized the Mexican political scenario during 1994 became unsustainable at the end of that year. A sharp depreciation of the peso, high interest rates, and the fall in real disposable income sharply deteriorated borrowers' capacity to service their bank debts. Banks suffered on both sides of their balance sheets: Many debtors defaulted on their obligations, and depositors demanded higher interest rates to compensate for inflation risk. The consequence was the bankruptcy of many banks and a severe economic crisis.

As a result, in the last ten years, Mexico has undertaken a series of reforms along the lines suggested by Mishkin's paper. Strict fiscal and monetary discipline, the adoption of a freely floating exchange rate, and an inflation targeting framework have gradually brought a degree of macroeconomic stability not seen in Mexico in the last 30 years.

The public-sector deficit dropped to 0.3% of GDP in 2005. The strategies used to reduce inflation have succeeded in anchoring expectations towards the central bank target and in reducing annual inflation from 52% in 1995 to 3.2% in April 2006. Strict fiscal policies and the development of domestic capital and derivative markets has allowed the government the substitution of domestic for foreign debt which has reduced its foreign indebtedness from 19.3% of GDP in 1998 to 9.4% in 2005. Private banks are now offering fixed-rate mortgages with 10 and 20 years maturities, and the market for mortgage securitization is growing rapidly; all of this was unheard of in our financial system a little over a decade ago. These strong macroeconomic fundamentals have facilitated the Mexican economy´s ability to absorb foreign shocks and the current de-leveraging process taking place in emerging markets.

The importance of undertaking reforms aimed at improving legal and institutional infrastructure and aligning the incentives of the various participants is well described in Mishkin's paper. In this respect, we have improved lender property rights by enacting a new bankruptcy law and initiating legal reforms that help to expedite foreclosure on credit guarantees.

The institutional framework has been further enhanced by the enactment of new regulation on credit bureaus that helps reduce information asymmetries. The blanket guarantee of deposits, which helped to prevent a large run on deposits during the banking crisis but increased the costs of its resolution, has been gradually rolled back. Stricter rules on connected lending were established, and accounting and auditing standards have been aligned to international guidelines. Banks´ balance sheets were gradually improved, and the entry of foreign banks – which started with the signing of a trade agreement with the United States and Canada – fully materialized, contributing greatly to the recapitalization of the banking system.

We have also moved gradually to a more risk-based kind of regulation, in which the central bank has played an important role by requiring banks wishing to operate in derivatives markets to comply with modern risk measurement and management techniques. Supervisory practices have improved radically, and legislation on prompt corrective actions and bank resolution procedures has been introduced recently.

In 2002, the Mexican Congress enacted a payment system law in line with the BIS "Core Principles for Systemically Important Payment Systems." This law ensures finality in all systemically important payment systems and gives legal certainty to the guarantees submitted. The law also grants power to Banco de México to regulate and supervise financial entities managing systemically important payment systems. In addition, Banco de México developed and now manages a large-value payment system which allows a bank's customers to transfer resources, in almost real time, between bank accounts established at different banks.

Early this year, we asked the IMF and World Bank to conduct an update of the FSAP carried out in 2001. The FSAP has helped to identify some pending issues, such as a special bankruptcy chapter for banks in our general law, and the need to provide financial authorities with a sufficient level of autonomy and legal protection. In emerging market countries, where powerful elites can have undue influence in shaping policy and the regulatory agenda to their own benefit, strong and politically independent public agencies are much needed.

Let me now turn to the challenges that host-country authorities have to face with the globalization of financial markets and institutions, which I consider a necessary complement to Frederick's agenda.

Competition

In order to acquire local depositors' bases and gain access to profitable household sectors abroad, the main vehicle of expansion of cross-border global banks is through the acquisition of existing financial entities in target countries. This strategy allows global banks to offer credit cards, mortgage loans, and insurance products where profits are high. However, the acquisition of existing entities rather than the establishment of new ones leaves market structures largely unchanged. While improvements are tangible in the derivatives and money markets, efficiency gains in other sectors often result in higher profits to the exclusion of consumer benefits.

Banks´ efficiency improved notably in Mexico after the entry of foreign banks. Just to mention a figure, bank efficiency, measured as the ratio of operational costs to total income, decreased from 70% in 2000 to 53% in 2005. We are also witnessing lower prices and better conditions for mortgages. However, in other segments, such as credit cards and basic banking services, where banks face less competition, efficiency gains have translated only into higher profits. Interest

margins on a consumer loan are three times higher than on a corporate loan. Interest rates on credit cards are as high as 70% when annual inflation is close to 3%. Banks´ interest margins are much higher in Mexico than in the countries of origin the Mexican banks' shareholders, despite the fact that Mexican inflation, market volatility, and taxes are at levels very similar to those of the home-countries.

Benefits from globalization are not automatic, and in order to access them, measures should be taken to improve competition at the local market level. As in other areas, central banks can play the role of catalyst in improving competition in many emerging market economies.

The soundness of local banks

Subsidiaries are entities that are legally independent from parent banks and subject to different laws, regulations, and courts. However, global banks manage their subsidiaries as branches but keep their responsibilities limited to the invested capital.

The way in which global banks are managed could lead to many decisions that are good for the global bank but not necessarily positive for the subsidiary or host country.

1 There is a growing tendency to register transactions where funding and regulatory costs are lower. Although this makes sense from the global banks´ perspective, it shifts revenues away from the local bank where the business is originated.
2 Global banks also establish individual limits to credit exposure in each foreign country, according to the sensitivity of the overall portfolio. Thus, subsidiaries sometimes have to reduce their local exposures, even though these exposures are also financed locally.
3 Likewise, subsidiary banks invest in host-country sovereign debt according to capital risk weights which, having been set by parent banks and home-country authorities, are usually higher than those of the host country.
4 Global banks are also inclined to adopt matrix reporting arrangements by which local treasurers, comptrollers, and risk managers report directly to their parent bank's counterparts rather than to the local CEOs. Bank directors and managers usually are long-career employees of the parent bank. Holding them more responsible is not going to be enough.

These asymmetries between decision-making powers and economic rewards versus legal responsibilities are a matter of concern for host-country authorities when large local retail banks are involved.

One potential way to get local managers to look first to the subsidiaries' best interest could be to widen the ownership structure of large subsidiaries. Requiring minority shareholders to sit on subsidiaries' boards would encourage decision tak-

ing in the subsidiaries' best interest. It would benefit corporate governance and give meaning to the role of independent board members.

Why are widely held ownership structures considered to be highly important for global banks and not for systemically important local subsidiaries? The idea that subsidiaries automatically reap the benefits of belonging to a widely held parent bank ignores the legal separation between them.

Market discipline

The need to encourage market discipline to supplement the work of supervisors is widely recognized at the international level. Mishkin acknowledges that banks' disclosure requirements need to go beyond the simple publication of balance sheets and income statements. As he correctly states, this is because:

> "... financial institutions are able to take on more risk than many conventional businesses and because they are typically provided with a government safety net, ..."

Mishkin also proposes to hold bank directors and managers responsible for timely and accurate disclosure of a wide range of information. He also suggests requiring financial institutions to be rated and even mentions the possibility of requiring the issuance of subordinated debt. These suggestions are very positive.

For market discipline to work, market participants need signals – in the form of prices – which reflect market perceptions, as well as instruments to enforce discipline and research carried out by independent analysts. The latter play an important role in markets, since financial information is not always easy for the common investor to come by or understand.

The presence of minority shareholders would facilitate the listing on local stock exchanges of systemically important subsidiaries. A public listing would provide market participants with price signals and instruments to exercise discipline. It would also provide independent bank analysts with a customer base and give meaning to the third pillar of the Basel II regulations. As it stands, the third pillar is simply one of disclosure, not of market discipline.

Impacts of foreign regulations on domestic financial markets

Regulatory differences among home countries could have adverse impacts on host-country markets. All banks incorporated in a jurisdiction have to comply

with its laws and regulations. However, when a local bank is a subsidiary of a foreign bank, it also has to observe the guidelines put forth by its controlling shareholder and the regulations of the jurisdiction where its parent bank is incorporated.

In general, we would expect the stricter regulation to prevail. Nevertheless, subsidiaries have to consolidate their books with those of their parent banks. In fact, parent bank shareholders follow the consolidated balances, not the local ones. This means that the subsidiaries' business and trading decisions are taken with close regard toward their impacts on the parent banks' balance sheets. This situation can have important adverse effects on host-country markets.

For example, capital adequacy rules usually establish a zero risk weight on local sovereign claims denominated and funded in domestic currency. Nevertheless, the New Capital Accord establishes risk weights on sovereign claims based on ratings provided by external credit assessment institutions or by internal rating methodologies. Although the Accord gives national supervisors discretion to apply lower risk weights to their domestic banks, it is very likely that subsidiaries of foreign banks will apply the capital weights established by their parent banks and by their home countries. Should this happen, it will increase the financing cost of host countries' sovereign debt denominated and funded in domestic currency.

The resolution of a troubled global bank

Finally, I would like to talk about the conflicts of interest that may arise when a global bank runs into trouble. Global banks are comprised of a constellation of entities incorporated in different jurisdictions. The failure of a global bank could easily lead to conflicts among the various parties involved, as their interests will diverge considerably.

The conflicts between home and host-country authorities could be particularly significant if the relative sizes of the parent bank and its subsidiaries are substantially different. Home-country authorities will not be very keen on supporting subsidiaries overseas, even if they are relatively important for a host country. On the other hand, host-country authorities could find it politically impossible to use public resources to support a foreign-owned bank.

There is no common understanding on how to deal with or resolve the failure of global banks. The absence of a common jurisdiction and supranational legal courts complicates the potential attainment of reasonable and fair solutions. Therefore, it is very important to devote more efforts to devising ways to improve existing frameworks so that cooperation among supervisors and central banks is encouraged.

These frameworks should include full and equal access to relevant and timely information on both a subsidiary's and a parent bank's global position as well as each one's risks. Home-country authorities should not have informational advan-

tages over host regulators unless they are willing to accept more responsibilities in terms of the resolution processes.

We welcome the recent changes introduced to the Basel Core Principles with regard to information-sharing arrangements between home and host-country supervisors. A major step forward is the recognition of the need of host-country authorities to have prompt access to all relevant information about their subsidiaries' parent banks. However, home-country supervisors still retain some discretion as to which information is to be shared with host-country authorities, and also can decide when it is appropriate to inform their counterparts. Further progress should be made in this area in order to ensure that during a crisis, host-country supervisors´ access to all relevant information will not be limited by home-country supervisors´ criteria.

Final remarks

The relevant question is not whether globalization is good or bad, but how to benefit from it. In this respect, we cannot ignore the challenges that host-country authorities have to face, especially in places where systemically important banks are owned by foreign global banks. There are no simple solutions to these challenges. I firmly believe the best way to accommodate the conflicting interests that may arise when banks operate across different jurisdictions is to have in place the right incentives to get economic agents to look after the soundness of all financial institutions involved.

Conclusions

Concluding remarks

Jaime Caruana
Banco de España

Mr. Vice-President of the Government and Minister of Economy and Finance, ladies and gentlemen,

It is my pleasure to participate in this concluding session of the conference and to be accompanied at this table by Pedro Solbes. I hope you found the presentations and discussions inspiring and motivating. I certainly did. We are now witnessing some profound changes in the way our societies organise their economic relationships, and these naturally pose new challenges to central banks, regarding both their role of monetary policymakers and their responsibility to preserve and foster safer and more efficient financial systems.

Over the last two days we have discussed some of the underlying forces of change and their implications for the design of sound monetary policy and financial architecture, including the question of how best to arrange payment and security settlement systems. Let me briefly elaborate on some of the issues raised at the conference which I found particularly interesting. I will first reflect on the difficult question of how monetary and financial stability relate to each other and then move to some particular issues of special interest for a currency area, such as EMU.

Monetary and financial stability

The global financial system has developed at an unprecedented pace in the last two or three decades. During this time, many countries have undergone significant processes of financial liberalisation that have contributed to deeper and wider markets, in terms of both the number of participants and the assets traded on them. In the international sphere, financial liberalisation has led to a growing number of countries gaining access to global capital markets and to a stepping up of the economic and financial links among different regions. Technological progress has also played an important role. The ability of market participants

to obtain and process vast amounts of information almost instantaneously and to conduct complex transactions at low cost has grown enormously.

In short, all these changes have significantly increased the possibilities for risk-sharing among economic agents. And, as such, there is ample consensus that this process of financial deepening brings tangible benefits for businesses, households and governments alike. There is little doubt either that this phenomenon will continue its course over the foreseeable future.

In parallel to the changes on the financial landscape, we have also witnessed a remarkable performance by our monetary policy frameworks in terms of attaining and maintaining low and stable inflation, with noticeable effects on economic welfare. I believe that those achievements are largely permanent. I further consider that, as stressed by Alan Blinder in the introduction to his insightful paper, the debate over some of the core principles for sound monetary policy practice seems to be resolved for now. For example, there is currently substantial agreement, both among academics and monetary authorities, on the need to provide central banks with sufficient formal and effective institutional independence, the superiority of interest-rate operational targets over quantitative instruments, and the pursuit of low inflation as the main objective for monetary policy.

Both trends – towards deeper and more integrated financial markets, at one end, and towards monetary policies clearly determined to deliver price stability, at the other – are important factors behind the sound macroeconomic performance recorded practically worldwide over the last decade.

Notwithstanding this positive view on the recent past, central banks must deploy their best efforts – improving their monetary policy and regulatory and supervisory arrangements – to preserve and consolidate the attainments I mentioned, since various significant risks and challenges lie ahead. As stressed by Frederic Mishkin, the final success of the processes of financial liberalisation and globalisation in developing economies hinges crucially on the ability of both policymakers and the private sector to properly respond to a rapidly changing environment. No doubt, the spirit of this proposition applies likewise to developed countries.

An increasingly liberalised and globalised financial system necessitates a reconsideration of some key inputs in our current monetary strategies. The greater relevance of markets and their evolving nature requires an ongoing assessment of the different monetary policy transmission mechanisms. This area, while critical to successful monetary policy decision-making, still remains shrouded in considerable uncertainty. Undoubtedly, the emergence of new financial assets and financial intermediaries poses fresh questions here.

Furthermore, the magnitude of the financial funds flowing across different countries at the present time and the uncertainty surrounding the sustainability and the possible effects of an eventual correction of the so-called global imbalances means that central banks worldwide must take a much broader and complex set

of indicators into consideration when formulating their policies. Moreover, we are probably at a juncture that can be best described as one of "Knightian uncertainty", in that some of the risks we are facing, and the hypothetical consequences following their realisation, are essentially immeasurable. Consequently, good monetary policymaking requires not only a continuous reassessment of market conditions and expectations, but also forecasts and projections flexible enough to encompass a wide set of scenarios.

I share the view set out yesterday by Jean-Claude Trichet that a sound communication strategy takes on special importance in the current environment, as well. Anchoring expectations about future inflation is a valuable asset, and especially at times of financial and real turbulence. Fluent communication with market participants and the general public is also of great help in preserving credibility, especially when circumstances lead to relatively persistent temporary departures from what is sometimes called a "neutral" monetary policy stance, as some of our central banks have faced in recent times, or when specific factors push inflation rates above what the monetary authorities normally consider as satisfactory.

Moreover, alignment of market expectations with the central bank's own targets, through fluent and transparent communication, allows monetary policy to exert a stronger influence along the entire yield curve. Yet notice that this latter channel becomes most relevant if central bankers approach markets from the sort of leadership position emphasised by Professor Blinder. I agree with him on this important point: central bankers should continuously monitor markets and should extract from them as much information as possible. But they must not put themselves under the thumb of what is sometimes erratic market sentiment.

In any event, one of the most robust lessons we can extract from the recent period of global monetary and output growth stability is that low inflation may well be consistent with episodes of high financial volatility. Cases of financial stress have been recorded both in industrialised and in emerging market economies over the last few years without noticeable inflationary pressure. Even in countries whose financial system has proved more resilient, financial cycles have become wider and more volatile.

Indeed, a long period of monetary stability coupled with low interest rates, as has been the case for some years now, may arguably be conducive to certain types of imbalances in asset markets. In such an environment the poor returns on low-risk investments and the softening of lending standards may lead investors to take on increasingly riskier projects. As economic agents underestimate the total risks of their positions, the volume of investment in financial – and, in some cases, also real estate – markets rises at a strong pace, and with it, asset prices and the overall level of credit, perhaps, with both being further fuelled through the feedback mechanism operating between collateral value and credit capacity. In that situation, there is a risk that a sharp asset price reversal might have a size-

able impact on the stability of the whole system. Therefore, an otherwise beneficial context of price stability and low financing costs might sometimes sow the seeds for the emergence of financial imbalances.

This latter, somewhat ironic conclusion has spurred a recent debate on the role to be assigned to monetary policy as an instrument of use in correcting financial and real estate market excesses. Should central banks react to asset prices over and above their direct effects on purely monetary goals, such as inflation? The answers vary depending mainly on the confidence that one places in the ability of central banks to detect price misalignments early and to undo them without causing major damage to the economy.

I tend to think that while in normal conditions monetary policy should react only to changes in economic variables insofar as they bear some influence on inflation dynamics, there are exceptional circumstances in which policymakers have enough signals to conclude that the economy, as a whole, is facing significant risks, thus warranting a more pre-emptive policy approach. This pragmatic view is consistent with the idea that monetary policy decisions should be based not only on the most likely scenarios but also on other, less probable ones which, however, may have far-reaching implications for the entire system should they materialise. Certainly, an abrupt asset price correction pertains to this class of low-probability event that may ultimately entail significant costs for a country's welfare.

More importantly, to place this approach to monetary policy in its right place, it is critical to recognise that some of the risks inherent in the financial sphere should first be the subject of an appropriate prudential framework. It is no exaggeration to say that any concern about unbalanced market developments is, at core, a concern about a problem of inappropriate risk management. This statement applies to the case in which, due to over-optimism or short-sighted behaviour, market participants fail to appreciate the true risk of their investment or lending strategies. Yet even if their behaviour can be thought as being fully rational from an individual perspective, nothing ensures that the final outcome will not convey important risks at a systemic level that are not properly internalised by single agents. As a result, a portion of the marked volatility and procyclicality of some key financial variables, like asset prices and credit, may be understood as a reflection of individual and collective risk misjudgement.

Hence, there is much to be gained in terms of greater resilience and efficiency of the financial system through the design of regulatory and supervisory frameworks aimed at combating the factors that underlie a poor assessment of risks at their root. In this sense, a sound prudential framework should provide financial institutions with the right incentives to properly assess and monitor the risks of their investment and lending policies, incorporating them accordingly into their pricing decisions. Increased awareness of risks, and how these evolve along the business

cycle, favours earlier reactions to changing conditions and smoother adjustments in the flow of credit, thus reducing the likelihood of episodes of abrupt liquidity and credit contraction.

The New Capital Accord, known as Basel II, is an example of a prudential framework that makes the foregoing principles I have outlined its centrepiece, since it seeks to strengthen the stability of the international banking system by promoting the implementation of more robust and comprehensive risk management practices. It does so mainly by establishing a more precise and sensitive system to link banks' real risks and the minimum regulatory capital requirements, and by imposing higher levels of transparency in banks' financial reporting, hence fostering closer scrutiny by market participants.

A more risk-sensitive capital framework tends to make banks more watchful of the actual risks of lending policies focused on short-run targets, such as market share or portfolio size, which presumably are important ingredients in periods of credit booms sustaining speculative activities. Furthermore, greater transparency in the information provided by banks on their balance-sheet and risk position must help alleviate the informational asymmetries among shareholders, lenders and borrowers that arguably lie behind most episodes of financial distress.

Yet despite the recent advances in the design of a banking supranational prudential framework, much remains to be done, especially with regard to other financial institutions and markets. From my personal experience as governor of a central bank with supervisory and regulatory responsibilities, member of the Governing Council of the ECB and member of the Basel Committee on Banking Supervision, I strongly believe that there is much merit in central banks playing an active role in the pursuit of prudential policies that rightly respond to the challenges posed by the current process of intense financial deepening. I would agree that one specific institutional model is unlikely to fit all. Moreover, the operational separation between prudential and monetary policies should in any event be preserved. However, it is in the general interest of societies to take advantage of the institutional strength and the valuable information and analytical expertise held by most central banks in order to safeguard the soundness of financial systems.

Reflections on challenges in EMU

The challenges faced by a central bank are certainly not smaller if it has to conduct a single monetary policy for a multinational currency area.

We have seen that in the new economic and financial landscape, central banks should explore ways to fully internalise the close links between financial and macroeconomic stability. The Eurosystem is well suited to take into account the ex-

isting synergies. The Treaty itself establishes price stability as a primary objective while at the same time calling on the ESCB to contribute to the smooth conduct of prudential policies and the proper operation of payment systems.

Nonetheless, central bank policies must deal with a heterogeneous economic scenario where national economies retain distinctive features both in terms of exposure to specific shocks and as a consequence of the different functioning of domestic policies and allocation mechanisms. Moreover, while markets are increasingly integrated there are still frictions impeding sufficiently flexible flows of products, capital and labour. Even in the financial services area, and although progress in developing the single market is already evident, some transactions involving agents in several euro zone countries are still penalised in comparison with purely domestic operations.

Against this background, the Eurosystem has had to face the challenges posed by economic heterogeneity and imperfect integration in two ways. Firstly, by complementing the monitoring of euro-wide aggregate variables with the analysis of relevant national developments in order to identify the policy that best helps ensure price stability in the euro area as a whole. Secondly, by promoting a better integration of markets, particularly financial markets, in the euro area.

Regarding this latter issue, the role of payment systems is crucial. As we have heard this morning, the Eurosystem is making a significant contribution by developing a wholesale payment system, known as TARGET2, which will provide for safer and more efficient large-value payment flows within the euro area. I would agree that more has to be done by the competent authorities to achieve higher integration for retail payments and securities transactions. However, the Eurosystem, together with the European Commission, is actively supporting the Single Euro Payments Area initiative and has devoted much effort to promoting more efficient and safer securities settlement systems and to facilitating the cross-border use of collateral.

In any event, I have the impression that in years to come the Eurosystem will have to strengthen further both aspects of its policy approach. As EMU is not likely to become a much more homogenous area in the foreseeable future, the need might be felt to pay more attention to key national economic developments on the basis of the contribution by NCBs, therefore making more intensive use of the federal organisation of the European monetary authority. My feeling is that country-specific analysis is proving increasingly informative for fully understanding the situation, prospects and policy needs of the euro area as a whole.

Similarly, I would not be surprised if the ECB were to find it appropriate in the future to raise its profile somewhat in defending a more integrated and liberalised market for financial services in Europe.

Conclusions

In sum, our economies are now experiencing some important changes, both with regard to how goods and services are produced and traded, and the possibilities that agents face to organise their economic decisions over time. Most of the underlying forces causing these changes must be judged as largely beneficial *per se*. Yet as occurs with any new situation, we face much uncertainty that requires a comprehensive learning effort. As central bankers, we have learnt that price stability should be deemed as a highly valuable but insufficient achievement to promote financial stability. We have also gained some understanding as to why this is so, and, hence, on the need to take some steps towards making the goals of monetary and financial stability compatible and sustainable. Admittedly, our knowledge is still scarce in some important areas. However, as the interaction between the two objectives is becoming more pronounced, the role of central banks is probably more complex but also more relevant.

Concluding remarks

Pedro Solbes, *Second Vice-President of the Spanish Government and Minister for Economy and Finance*

Good afternoon, governor, members of the Governing council, ladies and gentlemen,

Let me first of all thank the Bank of Spain for its kind invitation to be here with you today. It is always a pleasure for our country to host the meeting of the European Central Bank Governing Council. It is a particular pleasure if it is coupled with a symposium with such qualified attendance.

You have been discussing very interesting topics throughout the day. My comments today in closing this conference will deal with some of them, specifically those of the last two sessions: financial stability and macroprudential issues, and global imbalances. In both cases, I will discuss them briefly while trying to convey how these issues are viewed from outside the realm of central banking.

I will purposefully leave out the session on settlement systems, which as you know is a, shall we say, difficult topic for non-central bankers.

Macroprudential concerns have been high on the agenda of central banks and other supervising entities in the last few years. The interest of supervisors has gradually shifted from what intrinsic features make a bank vulnerable, to which macroeconomic traits might portend a general economic correction that could render some apparently sound banks vulnerable. This represents a remarkable change of emphasis from a decade or so ago. Let me offer two reasons which might partly explain this trend:

First, the supervision of banks at the micro level is now on a very sound footing. This is due to several factors: the microeconomic literature on bank solvency and bank runs has come a long way in the past decade and a half, while supervisors have displayed a high degree of competence in the execution of their tasks; in our country, we have the outstanding example of this in the Bank of Spain. Supervision as such has improved markedly, but equally important in disciplining bank behaviour have been the strict enforcement of rules governing the ad-

equacy of bank management teams and the prudent but vigorous exercise of moral suasion by supervisors. The progress in constraining individual bank behaviour to forestall future problems has been remarkable, even if some important challenges remain.

Second, behavioural finance has shown us the importance of the herd instinct in all financial issues. There are reasons to believe this instinct to be somewhat less prevalent in banking than in financial markets, for a variety of reasons; but of course banks are more fragile than investment vehicles, for reasons well known, so that inadequate behaviour among banks is much more worrying to all of us, not least to Governments who guarantee deposits. Therefore, inasmuch as excessively expansive macro developments could be due to herd-like imprudent lending by banks, macroprudential concerns and responses would be warranted.

In any case, we have to exercise care so as not to apply these concerns indiscriminately. A rapid buildup of debt may sometimes be a sign of rational adaptation to a new economic environment; increases in asset prices could be reflecting improved economic circumstances and not collectively irrational behaviour on the part of investors.

The creation of the euro area is certainly a case in point. For countries such as Spain, membership of the Monetary Union has entailed a dramatic break with our past of macroeconomic instability and high interest rates. This accounts for higher asset prices, since the existing capital stock becomes more productive, and hence more valuable, by virtue of this new macroeconomic environment; and lower interest rates lead to those higher future returns having more present value. The increase in investment and debt is also to be expected, with the inevitable lags, due among other factors to adjustment costs associated with changes in the physical capital stock.

We can debate the timing and size of these effects, and both issues are very much part of the economic discussion in our country, but the effects undoubtedly exist and are significant. We should therefore be wary of simplistic analyses which deem increases in asset prices and debt accumulation to be imbalances by definition, therefore requiring automatic corrections from the economic policy side.

If the creation of a monetary union seems too unique to be a general qualification to the macroprudential baseline case, there are other examples: in fact, any positive exogenous shock to the supply side of the economy would lead to an increase in the prices of assets and probably induce a faster rate of debt accumulation, as economic agents adjust their intertemporal consumption desires. This would be fully rational and would not require any economic policy response. Of course, one could qualify the applicability of this argument by pointing out that a main source of such shocks is structural reform, and that the euro area is not seeing much of it.

The rationality of the asset price escalation-buildup of debt is a very important part of the macroprudential discussion, and has justifiably been one of its main focal points. But another key element is often lost in this debate: the role of am-

plifying factors. I am thinking in particular of two: budgetary behaviour on the Government side, and labour market issues.

The fiscal response on the Government side is important, inasmuch as it can temper the expansive impulses that private demand is experiencing. If fiscal restraint from the public side compensates the higher propensity to spend on the private side, aggregate saving can remain stable, offering an important anchor for the economy; among other things, this would normally ensure that private investment accounts for most demand growth, so that we would have *prima facie* reason to believe that the new capital stock will generate enough returns to service the incurred debt.

Meanwhile, developments in the labour market also matter. Depending on labour market institutions, the expansion of demand attendant upon higher asset prices might lead to excessive wage growth and therefore create greater inflationary tensions. This would mean that the push from the demand side would end up dissipating in inflation, while investment would be deterred by adverse wage developments. As a result, the society's productive capacity, and hence its ability to service debt, would not increase at the same rate as its debt and problems would ensue, first of a macroeconomic nature and then, possibly, bank solvency problems. Conversely, smoothly-functioning labour markets would properly process labour demand pressures, turning them mainly into employment gains.

Of course, the budgetary behaviour on the Government side and the evolution of the labour market are factors that would only be adding to pressures arising elsewhere, in the credit market; they might thus be thought of as secondary. But their role may actually be key in two ways: they may precipitate the correction of asset prices and the ensuing weakening of the economy, giving policymakers less time to react; and, more importantly, they may generate macroeconomic problems even if the initial asset price increase was perfectly rational. Indeed, the economic difficulties of some eurozone countries since 1999 may be attributable to the inadequate response to the financial effervescence induced by monetary union, rather than to the inadequacy of such financial developments in themselves.

Global imbalances have also been touched upon in these meetings, and they are certainly a worrying part of our economic landscape. In thinking about them, we should focus on three questions: to which extent might they have a rational economic explanation? What risks do they pose? And, what is the optimal economic policy response from an aggregate point of view?

I will deal with these questions, leaving out the political economy part of the issue, which may well be the most important one: how to convince the main incumbent countries to participate in this optimal policy response by ensuring them a reasonable participation in the benefits.

In dealing with current account surpluses, it is helpful to differentiate between those incurred by oil exporters and surpluses run by developing countries which are not relevant exporters of crude.

Current account surpluses by oil-exporting countries, and the corresponding deficits in oil-importing countries, may be rational to a large extent, in an intertemporal sense. After all, the price of oil might not remain as high as it is now in the long term, and, if it does, oil-consuming countries will end up adapting by importing less of this raw material. One way or another, oil-exporting countries are unlikely to obtain as much real oil revenue in the long term as they are enjoying now. Hence, the imbalances due to high oil prices may be considered a rational intertemporal response by oil-purchasing countries, in the form of consumption-smoothing: borrowing from nations which benefit from high crude oil prices to tide them over while the adjustment to more expensive oil takes place.

In the case of developing countries with current account surpluses, the situation is different. First, these nations are exporting capital while they still have pressing investment needs of various kinds, not least in the environmental area. One might deem this a secondary concern, given the high rates of investment that many of them are nonetheless sustaining, but there is also the issue of consumption: at present, poor developing country families are foregoing consumption on a large scale to finance much richer consumers in developed countries (as well as government deficits in some of them). Whether this makes any sense is at least debatable. There is reason to believe, furthermore, that some of these imbalances may be caused by exchange rate policy.

But, as we know, one country's surplus is another country's deficit. And it is also apparent that fiscal indiscipline in some developed countries, particularly the US, is unduly eroding its national saving rate and therefore contributing to its current account deficit.

We all know the risks that excessive current account imbalances entail. Mainly, the risk of a disorderly correction in exchange rates, with currency disruptions and damage to the world trade system. The fact that part of the imbalances can be considered logical from an economic standpoint offers some consolation, but only some; after all, oil-exporting countries are also accumulating assets vis-à-vis deficit countries. If a currency crisis arose, there is no obvious reason to believe that these assets would not be part of the selling trend just as other assets that surplus countries have accumulated in recent years.

It is therefore heartening to see that incumbent countries have finally started to take action in dealing with these imbalances, from a cooperative standpoint. More important than the specific actions that have been adopted up to now is the fact that these countries recognize that imbalances pose problems and that joint action can be beneficial to the world as a whole. After all, currency stability is a world public good, the preservation of which is in the interest of all countries.

What specific recipes should be applied to deal with our present imbalances? Classic demand-shifting policies are undoubtedly part of the answer, and constitute the backbone of the coordination efforts that are now underway. But let me also offer some qualifications.

First of all, there is always the temptation to focus all the debate on exchange rates, and that is not desirable, for several reasons. Estimating equilibrium exchange rates is a subjective task, and exchange rate policy is perceived, rightly or wrongly, as a zero-sum game by all the main agents in this discussion; therefore, it is a variable that lends itself to shallow political discussions rather than to sober economic debates. The excessive public discussion of this topic could thus encourage protectionism and serve as a distraction from serious efforts on other economic policy fronts.

Second, it is also important to realize that there are limits to what macroeconomic policy, even if perfectly coordinated, can do or should do to address global imbalances. One reason is that some of the imbalances are due to structural factors: for example, in some countries with "insufficient consumption" from a world economy point of view, population aging, an underdeveloped financial system, or the scant availability of consumer goods may be more important causes than interest rates or disposable income. A lack of investment safeguards or a limited regard for the rule of law in a country could also inhibit investment flows to it and lead to capital outflows from this country to richer ones, contrary to what standard economic theory would predict. These structural variables cannot easily be influenced by macroeconomic policy.

We should also bear in mind that adjustment policies are not symmetric in their effects. Restrictive policies are almost always successful, while expansive policies, for reasons well known, are ineffective relatively often. Therefore, recommendations to maintain contractive economic policies in some countries and expansive policies in others might, if applied, end up reducing world demand and hence world GDP. One need not fully accept the "savings glut" theory in order to have some reservations about restraining demand in the countries that are now pushing the world economy forward.

These are some of the reflections I wanted to share with you today, by way of closing this symposium. Let me add one last comment, at the risk of stating the obvious: these are very important issues. There is often the tendency to dismiss them as topics of interest only to central bankers and G-8 ministers, but they have a substantial impact on the long-term welfare of our societies. We all benefit from an economic growth which is balanced among the different regions and hence less vulnerable to corrections. Equally beneficial, as we know very well in Spain, is having a robust, high-quality banking system, resistant to shocks and efficient at channelling savings towards investment.

I hope this conference has served to advance the state of knowledge in all these questions.

Thank you all for your attendance,

Contributors

In alphabetical order

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Mr. Blinder is the Gordon S. Rentschler Memorial Professor of Economics at Princeton University, where he also serves as Co-Director of the Center for Economic Policy Studies. In addition, he is a partner in Promontory Financial Group, Vice Chairman of the Promontory Interfinancial Network, and Vice Chairman of the G7 Group. From 1994 to 1996, Mr. Blinder served as Vice Chairman of the Board of Governors of the Federal Reserve System. He was also a member of the Council of Economic Advisers under President Clinton from 1993 to 1994. Mr. Blinder earned his Ph.D. in Economics at Massachusetts Institute of Technology (MIT) in 1971, and has taught at Princeton since that year, where he chaired the Department of Economics from 1988 to 1990.

Jaime Caruana

Mr. Caruana was the Governor of the Banco de España and Member of the Governing Council of the European Central Bank (ECB) from July 2000 to July 2006. He joined the International Monetary Fund (IMF) in August 2006 as Counsellor and Director of the Monetary and Capital Markets Department. From May 2003 to July 2006, he was the Chairman of the Basel Committee on Banking Supervision. Prior to joining the Banco de España, where he also served as Director General of Banking Supervision from 1999 to 2000, he was the Director of the Spanish Treasury and headed several investment services and fund management companies. Mr. Caruana has a degree in telecommunications engineering from the Universidad Complutense, in Madrid.

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Mr. Constâncio was appointed Governor of the Banco de Portugal (Central Bank of Portugal) in 2000, and is now in his second term after reappointment in May 2006. He also served in this same post from 1985 to 1986, after several

mandates as Vice-Governor (1977-1979 and 1981-1984). In addition, he was executive Director of the Banco Português de Investimento (1995), non-executive Director of Electricidade de Portugal, the Portuguese national power utility (1998-2000), member of the Conselho de Estado, an advisory body to the President of the Republic (1996-2006), Secretary of State for Budget and Planning (1974-1975 and 1976), and Member of Parliament (1976, 1980-1981, and 1987-1988). He graduated in Economics from the Universidade Técnica de Lisboa.

Vittorio Corbo

Mr. Corbo has been serving as Governor of the Banco Central de Chile (Central Bank of Chile) since May 2003. Prior to this he was Head of the Macroeconomic Development and Growth Division of the World Bank (1984-1991), professor at Concordia University in Canada (1972-1981), professorial lecturer at Georgetown University (1986-1991) and Vice-President of the International Economic Association (1998-2002). Since 1981 he has also held the position of professor of the Economics School of the Catholic University of Chile. In recent years he has been an adviser to the World Bank, the Inter-American Development Bank and the IMF. Mr. Corbo received a Ph.D. in Economics from the MIT in 1971.

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Mr. González-Páramo has been a Member of the Executive Board of the ECB since June 2004. Previously he held several posts at the Banco de España, where he was a member of the Executive Board (1998-2004), of the Governing Council (1994-2004), and senior economic adviser (1989-1994). He has also acted regularly as adviser to many public policy institutions, including the World Bank, the International Development Bank, the European Commission and several Spanish government agencies. Mr. González Páramo obtained a Ph.D. from Columbia University in 1986, and, since 1998, has been a professor of economics at Universidad Complutense.

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Mr. Knight has been General Manager of the Bank for International Settlements since April 2003. From 1999 to 2003, he served as the Senior Deputy Governor at the Bank of Canada, where he was also the Chief Operating Officer and a member of the Board of Directors. Prior to this, from 1975 to 1999, Mr. Knight was with the IMF, where he held senior positions in research and operations. While at the IMF, he taught at the Johns Hopkins University School of Advanced International Studies and the Virginia Polytechnic Institute and State University. From 1971 to 1975, he taught at the University of Toronto and the London School of Economics, from where he holds a Ph.D. in Economics.

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Mr. Liikanen is the Chairman of the Board of the Suomen Pankki (Bank of Finland), and has been a Member of the Governing Council of the ECB since July 2004. Also, he is currently the Governor of the IMF for Finland. He earlier held several posts at the European Commission, including Commissioner for Enterprise and Information Society (1999-2004), and Commissioner for Budget, Personnel and Administration (1995-1999). Prior to this, he was elected as a Member of the Finnish Parliament (1972-1990), and served as Minister of Finance (1987-1990). From 1981 to 1987, he was Secretary-General of the Finnish Social Democratic Party. Mr. Liikanen holds a Masters degree in Political Science (Economics) from the University of Helsinki.

Frederic S. Mishkin

Mr. Mishkin is the Alfred Lerner Professor of Banking and Financial Institutions at the Graduate School of Business of Columbia University. He is also a research associate at the National Bureau of Economic Research, a senior fellow at the Federal Deposit Insurance Corporation Center for Banking Research, and is currently the President of the Eastern Economic Association. Since receiving his Ph.D. from the MIT in 1976, he has taught at the University of Chicago, Northwestern University, Princeton University and Columbia University. From 1994 to 1997 he was Executive Vice President

and Director of Research at the Federal Reserve Bank of New York. In September 2006 he was appointed Governor of the Federal Reserve Board.

Christian Noyer

Mr. Noyer is the Governor of the Banque de France and has been a Member of the Governing Council of the ECB since November 2003. Prior to this, from October 2002, he was Special Advisor to the French Ministry of Economy, Finance and Industry. In June 1998 he was appointed Vice-President of the ECB and occupied this position until June 2002. Among other senior posts, he has been Director of the French Treasury, member of the European Monetary Committee, alternate Governor in the IMF and the World Bank, and Chairman of the Paris Club of Creditor Countries. Mr. Noyer graduated in Law at the universities of Rennes and Paris, and holds a diploma from the Paris Institute of Political Sciences.

Guillermo Ortíz

Mr. Ortíz was appointed for his current position as Governor of the Banco de México in 1998. Previously, he served as Secretary of Communications and Transportation in Mexico for a brief period, just before the economic crisis of 1994, when he was appointed as Secretary of Finance and Public Credit, where he served for three years. During that time he was also President of the Banking Privatization Committee of the Ministry of Finance. From 1984 to 1988, Mr. Ortíz was Executive Director at the IMF. Prior to his long career in public service, he taught at several universities in Mexico and the United States. Mr. Ortíz gained his Ph.D. in Economics from Stanford University.

Lucas D. Papademos

Mr. Papademos has been the Vice-President of the ECB since 2002, where he also sits on the Executive Board and the Governing Council. Before joining the ECB, he held a number of senior posts at the Bank of Greece, including Economic Counsellor (1985-1993), Deputy Governor (1993-1994), and Governor (1994-2002). Mr. Papademos obtained his Ph.D. in Economics from the MIT (1977), and has taught at Columbia University (1975-1984) and Athens University, where he has held a professorship since 1988.

Raghuram G. Rajan

Mr. Rajan is the Economic Counsellor and Director of Research at the IMF. Prior to this position, he taught at the Graduate School of Business at the University of Chicago where he is the Joseph L. Gidwitz Professor of Finance. In 2003, Mr. Rajan was awarded the inaugural Fischer Black Prize by the American Finance Association for contributions to finance by an economist under 40. His research is broadly on the role of institutions, especially financial institutions, in fostering

economic development. He earned his M.B.A. from the Indian Institute of Management, Ahmedabad, and his Ph.D. in Economics at MIT.

Vincent R. Reinhart

Mr. Reinhart assumed his current position as Director of the Division of Monetary Affairs at the Board of Governors of the Federal Reserve System in 2001. Prior to this, he was Deputy Director of the Division of International Finance at the Board, with responsibility for the sections of international banking, financial markets, international financial transactions and trade, and quantitative studies. Mr. Reinhart has published extensively on policy issues in international finance and trade, macroeconomics and monetary policy. He earned a MPhil in Economics at Columbia University in 1982.

Anthony M. Santomero

Mr. Santomero was the President of the Federal Reserve Bank of Philadelphia from July 2000 to April 2006. In that role, he was a voting member of the Federal Open Market Committee. During his career at the Federal Reserve, Mr. Santomero served as chair of the System's Committee on Credit and Risk Management, and as a member of the Financial Services Policy Committee, and the Payments System Policy Advisory Committee. He was also Vice Chairman of the Conference of Reserve Bank Presidents. Mr. Santomero gained a Ph.D. in Economics from Brown University in 1971, and was the Richard K. Mellon Professor of Finance at the University of Pennsylvania's Wharton School.

Pedro Solbes

Mr. Solbes has been Second Vice-President of the Spanish Government and Minister for Economy and Finance since 2004. From 1999 to 2004, he was the Commissioner for Economic and Monetary Affairs at the European Commission and, prior to this, he served as Secretary of State for Relations with the European Community (1985-1991), Minister of Agriculture, Food and Fisheries (1991-1993), and Deputy Prime Minister and Minister for Economy and Finance (1993-1996). Mr. Solbes graduated in European Economics from the Université Libre de Bruxelles and in Law from the Universidad Complutense, where he also gained his Doctorate in Political Science.

Jean-Claude Trichet

Mr. Trichet has been the President of the ECB since October 2003. A few months before that appointment, he was elected as Chairman of the G-10 Governors. Prior to this, he served two terms (1993, 1999) as Governor of the Banque de France. Mr. Trichet has also served in a variety of public policy roles, including a position as adviser to the President of the Republic, head of International Af-

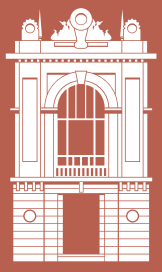
fairs of the French Treasury and Chairman of the Paris Club from 1985 to 1993. In addition, he was Chairman of the European Monetary Committee and a member of the Council of the European Monetary Institute and the Board of the Bank for International Settlements.

Gertrude Tumpel-Gugerell

Ms. Tumpel-Gugerell has been a member of the Executive Board of the ECB since 2003. Prior to joining the ECB, she held a number of key positions at the Oesterreichische Nationalbank (Austrian National Bank), including Director of Area Corporate Planning and Management (1992-1997), Executive Director of the Economics and Financial Markets Department (1997-2003), and Vice Governor (1998-2003). She also served as member of the Economic and Finance Committee of the European Union (1997-2003) and Chair of the Banking Advisory Committee of the European Union (2002-2003), and as a member of the International Relations and Banking Supervision Committees of the ECB (1999-2003). Ms. Tumpel-Gugerell also sits on the University Council of the University of Vienna, where she gained a Ph.D. in Economics in 1981.

Axel A. Weber

Mr. Weber has been President of the Deutsche Bundesbank and Member of the Governing Council of the ECB since April 2004. Before starting his career in central banking, he taught and conducted research, mainly in the field of monetary economics, at the University of Cologne (2001-2004), the Johann Wolfgang Goethe University in Frankfurt am Main (1998-2001) and the Rheinische Friedrich Wilhelms University in Bonn (1994-1998). From 1998 to 2002, he was the Director of the Center for Financial Studies in Frankfurt am Main. Mr. Weber obtained his Doctorate in Economics from the University of Siegen.



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