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**Asset Price Bubbles and their Implications for
Monetary Policy and Financial Stability**

Ladies and Gentlemen,

It is a great honour and pleasure for me to talk today in Chicago at the invitation of the World Bank and the Federal Reserve Bank of Chicago in front of such a distinguished audience on the theme of asset price bubbles. As a central banker, my main focus will be on the implications of asset price developments and bubbles for both monetary policy and financial stability.

The far-reaching changes observed over the last decade on financial markets, the growing role of these markets for the financing of the economy, and the evidence gathered over the recent period on the key role that financial factors may play in shaping and amplifying the business cycle, have drawn attention to the relative importance of asset prices and wealth effects on the real economy.

There are at least **two reasons why asset prices and wealth effects may have grown** over the last decade:

- **first, changes in asset valuations**, mainly driven by the rise in the new economy stock prices from the mid-1990s and their subsequent collapse in 2000, **have been dramatic**. This is well documented for the United States. But, even in Europe, where the influence of the so-called “new economy” is more modest, the rise in stock prices has also been significant ;

- second, **these changes have probably influenced private spending more than past asset prices movements did** because of the more widespread share ownership observed in a number of industrialised countries. As far as France is concerned, market capitalisation as a percentage of GDP increased approximately fourfold between 1990 and 2000 (28% to 110.5%) and we have some evidence that the share of Households' equity holdings in financial assets has also risen.

All of these developments have recently raised the issue of whether monetary policy should react to financial asset prices, and more generally to asset prices. The motivation is two-fold: **not only could the large swings**, misalignments or even bubbles, **on asset prices endanger price stability**, which is the main objective of most central banks, **but also they could impinge upon financial stability**, which is an other important goal of central banks. Let me now develop these two points.

1 – Implications for monetary policy

Transmission channels of monetary policy

The role asset prices may play in the transmission mechanism of monetary policy is well known theoretically, although quite difficult to characterise empirically. Monetary policy mainly controls the interbank overnight rate, which is not directly relevant for any material economic decision. The way to which monetary policy affects the real economy is when it impacts on relevant financial prices, i.e. when it moves the whole yield curve, or when it affects the exchange rate and other assets prices.

There might be there **several channels through which the policy rate can affect asset prices** or asset valuations:

- first, changes in interest rate modify people's expectations about future economic growth, and thus their **profit expectations**;
- second, monetary policy decisions may **change the set of discount factors economic agents apply to their profit expectations** or to the future stream of services or revenues from the asset they hold (housing for instance);
- finally, interest rate changes may **induce portfolios' shifts amongst assets** that may in turn affect their relative prices.

Besides this, and for the sake of simplicity, I will call it the "interest rate channel", **changes in asset prices also generate wealth effects** that may have a significant impact on several components of aggregate demand, namely consumption and investment. These wealth effects feed through to the economy via various channels, such as a direct increase in net wealth, which may lead to a rise in consumption because of households' inter-temporal smoothing behaviour; via Tobin's Q, which activates firms' investment; or via an increase in the value of collaterals, which may reduce agents external financing constraints and enhance final spending, in accordance with the "broad credit channel". Although the evidence is mixed about the effectiveness of the wealth channel, even in the United States¹, it is likely to have increased over recent years. Moreover, asset prices fluctuations or changes might also activate some confidence or expectations channels that may in turn influence households' or firms' spending decisions. For all of these reasons, asset prices have a particular role in the conduct of monetary policy.

How should central banks react?

Does this mean that monetary policy should react directly to asset prices? Or, more precisely, should asset prices be directly taken into account by the central bank's reaction function? This issue is still debated amongst researchers and academics; my feeling is that **we should remain extremely cautious about it**, perhaps because it would be like opening Pandora's Box if we started setting our key policy rates according to asset price changes. Another reason for being extremely cautious is that assessing asset prices' valuations is a very challenging exercise. And **what matters is not only the asset price level per se**, or the pace of its change, **but also its deviation from a highly hypothetical fundamental value**, which basically is hard to measure or determine.

Although, from time to time, it may seem that asset price dynamics are not really correlated to overall economic development, it is generally hard to assess whether these dynamics are rooted in some deep fundamental changes or whether asset prices evolve according to some "pathological path". The recent "tech-stock bubble" provides us with an illustration of such a difficulty: while one was witnessing the "irrational exuberance" in 1996, the surge in capital spending associated with the development of new technologies resulted in a faster productivity growth, which in turn boosted equity prices. At that time, uncertainties about fundamentals (was there an American miracle?) made difficult a proper assessment of asset valuations, although the large movements in asset prices were a concern for central banks.

¹ Cf. Martin LETTAU and Sydney LUDVIGSON (2001): "Understanding Trend and cycle in asset values: bulls, bears and the wealth effect on consumption", CEPR discussion paper, n° 3104, December.

However, **when expectations reverse**, for example due to the reassessment of expected profitability in the economy, **and consequently asset prices decrease**, **the point is to determine whether the attitude of the central bank ought to be different in order to preserve monetary and financial stability**. That is, some could argue that the central bank's response should be asymmetric. In the booming phase, as long as price stability is not endangered, central banks do not react to the rise in asset prices. Conversely, in the recession phase or when a bubble bursts, central banks could consider reacting if they deem that monetary and financial stability is endangered. **What could then restrain them from doing it?** Such an asymmetric reaction, all the more if it seems to be systematic, **has actually a cost**, pointed out in the literature, since it may generate some **moral hazard problems**: as long as economic agents believe the central bank will ultimately make use of its "safety net", there is an incentive to invest on riskier projects in order to magnify expected returns, keeping in mind that potential losses are likely to be limited.

Would then, a systematically symmetric reaction by a central bank to asset price changes **solve this problem? I would not share that view**, because central banks cannot accurately assess the deviation of asset prices from their highly hypothetical fundamental value. To illustrate my point, let us consider a situation in which the central bank fails to diagnose the presence of a bubble, and therefore does not react appropriately to the surge in asset prices, then agents may become involved in riskier projects without having consciously taken the decision to accept greater risk, but on the ground of what they have interpreted as a sound financial and economic environment. As a result, we have shift to another problem, which is close to the idea of "disaster myopia".²

² J. M GUTTENTAG and R. J HERRING (1986), "Disaster myopia in International Banking", *Essays in International Finance*, 164, Princeton University.

The issue of measuring price stability

However, this raises another issue, especially in the current context of muted inflationary pressures but ample fluctuations in asset prices: **are we measuring inflation accurately?** Is price stability being ensured, in the context of large movements in asset prices? **Shouldn't asset prices be taken into account when defining price stability?** Up to now, this debate has focused on the **role asset prices may play as leading indicators of inflation:** one rationale behind this thinking may be that asset valuation is computed in a forward looking manner, and therefore asset prices embed expectations about future economic growth and future inflationary pressures. Empirical evidence gathered on such an issue tend to support the idea that some asset prices, **housing prices** in particular, may actually play such a role. However, this theory has to be qualified by the fact that, as I mentioned earlier, **wealth effects are difficult to establish** in a definitive manner. This is probably less true for the US, although this is debatable and could be discussed in this conference, but this is more likely to be true for the euro area. **Moreover, there might be a danger that asset prices diverge from the CPI,** as this was observed over the last few years. There might be an internal conflict here if the objective of price stability is defined by aggregating the changes in the CPI and the changes in asset prices, and this is a crucial issue since the nature of both types of prices is fairly different.

So, do asset prices have a key role to play in the conduct of monetary policy? To answer this question, I will briefly **describe the way we deal with asset prices in the conduct of the European single monetary policy.** As you already know, the ECB's monetary policy strategy is based on a two-pillar approach. This concept of monetary policy was designed to promote the conduct of a sound monetary policy whilst coping with the complexity of the set of major determinants of

inflation –fully recognized by the Governing Council of the ECB–. That is the reason why we rely upon a binocular vision of the factors of inflation, i.e. as a monetary phenomenon according to pillar 1 and as the result of short-term to medium-term developments of inflation according to pillar 2. This framework is also well suited to addressing the asset price bubble issue.

In this context, the **first pillar** is very helpful for analysing how ample liquidity is within the euro area, that is to say how much the broad monetary aggregate (M3) deviates from its reference value, and how economic agents make use of this liquidity: credit and loan developments are carefully monitored, in line with economical and financial developments. Portfolio shifts are also an important part of the monetary analysis. Too rapid a credit expansion to the private sectors associated with large portfolios shifts towards equities and a strong rise in stock or asset prices would, under normal economic conditions, signal the risk of a bubble formation.

The **second pillar** consists of a wide range of economic and financial indicators: stock and bond prices, housing prices, exchange rates are also analysed in depth. Obviously, their assessment is made in the context of maintaining price stability over the medium term, and the ECB does not react to their signals unless price stability is endangered. To recap, if monetary policy does not react directly to asset price developments or to an asset price bubble, it has clearly to take under consideration all the consequences of these developments on aggregate demand and aggregate supply, on economic agents' confidence and expectations, since they may at some point affect price developments.

Let me now turn to my second point, that is the implications of asset prices bubbles for financial stability.

2- Implications for financial stability

Over the last decade, we have experienced several financial crises and contagion episodes: just to name a few episodes, the Mexican crisis in 1994-1995, the Russian-LTCM in 1998, the “Tech-Bubble” that ended in 2000, or more recently the financial crises in Argentina and Turkey. However, recent research³ has shown that, if the frequency of financial crisis is not significantly different from what was observed in previous periods over the long run (1883-1998), recent episodes were certainly shorter, but perhaps more severe.

Although financial globalisation has brought about improved macro-economic efficiency, via a more efficient allocation of resources and capital, liberalised capital flows, increased competition on financial markets, increased transparency (apart from the recent ENRON episode!), **changes in asset prices have also become more pronounced** and have experienced clear misalignments or deviations from their “equilibrium” levels. **Moreover, credit seems to have played a greater role in asset prices fluctuations.** Initially observed during the “speculative bubbles” of the 1980s and early 1990s, this trend has persisted, if not amplified.

Several factors may explain these recent and abnormal patterns in asset prices. I shall give a few examples.

- First, **"short-termism"**: some market participants may have become more inclined to be mostly preoccupied with their short-term results. This trend might result, in particular, from growing pressure to yield good results immediately. However, these results are not necessarily sustainable. Marking-to-market financial products may also have contributed to this widespread focus on

immediate financial performances. This emphasis on short-term performance may result in increased volatility in the price formation process: the shorter the investment horizon of markets participants, the bigger the impact of any new information on prices.

- Second, **herding or mimetic behaviour**: mimetic behaviour is of course by no means a new phenomenon on financial markets. Technological developments on markets may however have gradually reinforced this type of behaviour, as participants are under increasing pressure to follow their peers through matching the performance of a benchmark. There is no doubt that the spread of benchmarking allows fund managers and clients to better assess their performance against that of other funds. But, in a context of growing competition within the sector, it may well have increased mimetic behaviour. Some market participants operators (whose own compensation is closely linked to the relative, rather than absolute, profit and losses they generate) may indeed have come to the conclusion that it would be better to be wrong along with everybody else, rather than running the risk of being right alone. A striking example of rational mimetic behaviour is the influence that hedge funds enjoyed as "opinion leaders" and trend makers. By its nature, trend-following amplifies the imbalance that may at some point affect a market, potentially leading to vicious circles of price adjustments and liquidation of positions. Moreover, more and more participants are able to access directly to financial markets, while the expertise to deal with a larger set of technical information is not evenly distributed. This may also reinforce the role of "gurus".

³ M. BORDO, B. EICHENGREEN, D. KLINGEBIEL and M. S. MARTINEZ-PERIA: "Is the Crisis Problem Growing More Severe?", CEPR, September 2000.

- Third, index management: as a fund management technique, it has proven very popular on equity markets and may have contributed to exacerbating movements in financial asset prices. Because their goal is to mimic the performance of indices, “passive managers” try constantly to match the composition of their benchmark. They thus help to amplify market trends, buying more as the market rises and liquidating more as the market drops. It can be argued that index funds distort the price of the targeted indices and that, as a result, the indices end up creating rather than measuring performance.
- Last but not least, the impact of risk management techniques on market dynamics is particularly enlightening with regard to the **question of asset price overshooting**. Value-at-risk calculations have become a crucial element of the standard approach used by market participants to evaluate the risk inherent in their market activities and to set up exposure limits. Of course, central banks and financial institutions should continue to encourage the use of these instruments. But, in times of financial turmoil, the growing use of sophisticated risk management techniques by financial intermediaries might have had the paradoxical effect of amplifying the initial shock, exhausting liquidity and contributing to contagion phenomena. Regardless of the intrinsic qualities of these risk management tools, we see that their growing use in the same fashion by all market participants may have produced pernicious effects. When market players rely on converging risk evaluations, they tend to take the same decisions at the same time, thus amplifying the initial shock to prices and trading volumes.

All those factors have one consequence in common: they encourage homogenous behaviour and reactions to the detriment of the diversity that is indispensable to the smooth functioning of financial markets.

So, what are the possible policy implications of these recent patterns or trends on financial markets? My opinion is that **financial authorities might reflect on some ways to foster behavioral diversity in financial markets**. As we have just seen before, some specific factors, such as short-termism, mimetic behaviour etc... have tended to make “contrarians” less pro-active on financial markets. As a consequence, in order to safeguard the smooth functioning of the markets, the diversity of participants’ behaviours must be protected or even reinforced. This necessary diversity should logically reflect natural differences in time horizons, strategies and reaction functions of market players. On this point, **I would like to explore amongst many others three possible avenues for future action for both monetary or financial authorities and the financial industry**.

First avenue: Strengthening the continuing efforts aiming at market transparency

Experience shows that **uncertainty and incomplete information are determining factors in mimetic behaviour**. These shortfalls in market transparency make mimetic behaviour seem rational to agents, who prefer to follow bigger participants, who are thought to be better informed, rather than develop their own analysis. Therefore, **strengthening transparency continues to be the priority**. In the same vein, attention should be paid to expand the skills and competencies required by the analysis of a more detailed and complex information. Transparency is useless if only a limited number of experts are able to deal with it.

One of the objectives of transparency is to enable better differentiation of borrower creditworthiness. A key feature of mimetic behaviour is that all borrowers are "tarred with the same brush". So when one emerging economy encounters difficulties, all neighbouring countries are treated in the same way – regardless of

their actual economic and financial situation. The same applies to businesses operating in the same economic sector. Transparency may have improved since the Asian crisis, which may explain why contagion effects are nowadays rather subdued (sees Argentina...). Let us continue and reinforce these efforts.

Second possible avenue: Taking into accounts the medium and long-term perspective of some market participants

Some investors, such as **pension funds and insurance companies**, have to invest funds in order to enable their customers to build up wealth over the medium and long-term, notably in preparation for retirement. Consequently, these types of investors are supposed to behave differently from traders and short-term investors, who are working on a very different time horizon. But at times it seems that they are all pushed to behave in much the same way, on the basis of a very short-term horizon.

To preserve, and even restore, their specific investment approach, these investors might be more shielded from excessive short-term pressures. This objective raises considerable difficulties, because it touches on the way in which the performances of medium and long-term funds and life insurance companies are assessed. **In other words, this objective concerns the accounting standards and practices they use.** It might imply that some rules and standards would be adapted to the medium and long-term horizon used by these entities.

Third possible avenue: Diversify the risk management tools of financial institutions

As I mentioned earlier, **even the best techniques can have adverse effects when used on a standard basis and by all participants.** To some degree, this is

perhaps **what has happened to value-at-risk based techniques**, which have been, for very good reasons, massively adopted by the financial industry. Because they use more or less similar parameters and suffer from the same weaknesses – for example, they did not take market liquidity into account adequately at the time of the 1998 crisis –, such tools might tend to give converging signals to those that use them. They thus encourage the mimetic behaviour that I discussed previously.

Of course, the fact that some market participants are more sophisticated than the average is a guarantee that standardisation will remain limited, since they will develop techniques that are little used by others.

However, supervisors might help, and obviously are already helping to spread the idea that **financial institutions should round out their current range of risk management tools to include extensive use of stress testing**. This technique offers a better reflection of the varying situations of institutions and of the diverse perceptions that institutions have of exceptional events. The application of stress testing techniques and their results are thus inherently more diversified than those resulting from methods based on the value-at-risk approach.

3- Conclusion

Asset price developments are a serious cause of concern for central banks since they may impinge upon both price and financial stability. And I would like to stress what I feel is the highly complementary nature of price stability and financial stability objectives: price stability is the bedrock on which financial stability is built.

However, in my opinion, **it is clearly not opportune to introduce asset prices into a monetary policy rule** the central bank should commit to **or in the central bank's reaction function**. Besides the reasons I already mentioned, another issue

is: which asset price should we take into account? Should we limit to stock prices, or extend the rule to housing prices, exchange rate, the cost of capital and so on? **I would also not support the idea of introducing asset prices into the measurement of inflation or the definition of price stability.** My first reason is that the nature of goods and services on the one hand, and assets on the other hand, is quite different, and so is the information contained in their prices. Another reason is that asset prices are highly volatile, much more volatile than other prices, especially in the current context of low inflation. Consequently, it might be difficult to implement a sound monetary policy by focusing on highly volatile indicators. Finally, it is highly questionable that one could determine scientifically what an asset price equilibrium value is. Some participants will probably address some of these issues during the conference, which are of great interest for central bankers.

I also provided you with some examples of possible options monetary and financial authorities may take to help improve the functioning of the financial cycles. **There is a lot of merit in embarking upon an overall review of regulatory, accounting and tax rules and regulations, as well as of codes of good conduct and good practices, and finally of structural developments of markets themselves.** I am convinced that this review, triggered not only by macro-financial considerations but also by dramatic micro observations, like ENRON, is likely to help identifying possible amendments and improvements that could, protect and enhance not only the integrity but also the behavioural and conceptual diversity which should make an essential characteristic of modern financial markets.

I thank you for your attention.