

## The relationship between monetary developments and the real estate market

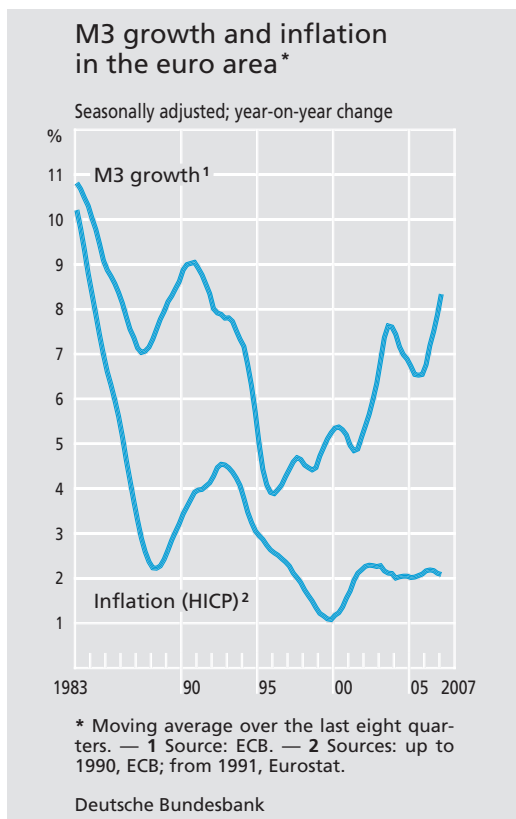
M3 growth in the euro area has been exceptionally strong in recent years. Given that prices were simultaneously comparatively stable, some observers are therefore now calling into question the long-term relationship between monetary and price developments, on which the monetary pillar of the Eurosystem's monetary policy strategy is based.

However, a subdued consumer price inflation may be quite consistent with strong monetary growth if the developments in the asset markets are taken into account. There are various theoretical reasons which argue for a close relationship between monetary growth and developments in the real estate market. This can also be demonstrated empirically by estimates that take due account not only of the usual explanatory variables of a money demand function but also developments in the real estate market. Moreover, the analysis shows that house price increases in some parts of the euro area have contributed to the strong money market growth of recent years. Conversely, the economy's abundant supply of liquidity has also influenced developments in the real estate market.

### Monetary developments in the euro area

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The monetary analysis forms one of the two pillars of the Eurosystem's monetary policy



*Current debate on the significance of money for price developments*

strategy. The special consideration of monetary variables is based on the generally accepted view that, in the long term, “inflation is a monetary phenomenon”, meaning that monetary growth in the medium to long term is associated with a rise in the general price level. Owing to the strong monetary dynamics in the euro area since 2001 and against the background of subdued inflation, more and more commentators are questioning the continuing validity of the close money-price relationship in the euro area that was observed in the past. They maintain that the rapid pace of monetary growth in the euro area shows less inflationary pressure than might be expected in the light of earlier experience. At the same time, however, it is precisely recent analyses which have also shown that monetary indicators still have good pre-

dictive properties for the inflation rate in the euro area.<sup>1</sup> Thus, monetary aggregates continue to provide essential information regarding future price developments – although the predictive quality of some monetary indicators would seem to fluctuate over time.

Generally, strong monetary growth does not lead to a rise in consumer prices if it is accompanied by a matching rise in real income. In this case, monetary growth serves the purpose of offsetting the higher demand for liquid funds that goes with the higher real income. One possibility of taking this correlation into account when interpreting monetary developments is offered by the analysis of the circulation velocity of money, ie the relationship between gross domestic product (GDP) and the money stock.

*Velocity of circulation of money*

A forward-looking monetary policy that is based, among other things, on monetary growth as an indicator of future inflation developments, is made easier if the velocity of circulation develops in a predictable way, at least in the longer term. The velocity of circulation in the euro area has been showing a falling trend for many years. This means that the economic agents’ money holdings have risen disproportionately in comparison with GDP.<sup>2</sup> One of the reasons for this is that part of the aggregate M3 is held not only for

*Accelerated decline in the velocity of circulation ...*

<sup>1</sup> See M Scharnagl and C Schumacher, Reconsidering the role of monetary indicators for euro area inflation from a Bayesian perspective using group inclusion probabilities, Deutsche Bundesbank Research Centre, Discussion paper, Series 1, No 09/2007, and B Hofmann, Do monetary indicators (still) predict euro area inflation?, Deutsche Bundesbank Research Centre, Discussion paper, Series 1, No 18/2006.

<sup>2</sup> This corresponds to an income elasticity of money demand that is greater than one.

“financing” GDP but also for wealth motives. Until 2001, the decline in the velocity of circulation was largely unproblematic from a monetary policy perspective, since it followed an easily predictable trend. Since 2001, however, it seems very much that this trend decline in the velocity of circulation has accelerated. Compared with nominal GDP, a distinctly stronger monetary growth is now observable.

*... raises the question of price risks of excess liquidity*

With regard to potential inflation risks, this raises the question as to whether there are demand or supply-side reasons for the accelerated monetary growth that has been observed since 2001. If the former is the case, say, owing to a sustained greater preference for liquidity on the part of the economic agents, it is likely that the stronger monetary growth does not constitute a risk to price stability. However, if the decline in the velocity of circulation has supply-side causes, such as persistently low financing costs or expansionary lending, it must be assumed that the high monetary growth rates will be accompanied by a corresponding risk of inflation in the medium to long term.

*Changes in the liquidity preference of the economic agents*

For a time, the heightened economic and geopolitical uncertainties in the wake of the terrorist attacks of 11 September 2001 and the dramatic decline in stock prices between 2000 and 2003 argued for a demand-side-driven acceleration of monetary growth in the euro area. At that time, the response of households and enterprises was to make extensive portfolio shifts in favour of secure and liquid bank deposits which are part of M3.<sup>3</sup> Since around mid-2004, however, such special effects have no longer been fostering

monetary growth. Instead, the monetary expansion has been driven by a marked increase in lending. Since borrowing is linked closely to planned expenditure, the accompanying build-up of liquid funds points, in principle, to price stability risks – probably to a greater degree than the accumulation of liquidity undertaken for precautionary reasons in the years of extremely large portfolio shifts.

These recent – mainly credit-driven – monetary dynamics cannot be explained entirely by interest rate movements either. Traditional money demand models that model the real M3 stock not only as a function of real GDP but also as a function of an interest rate variable (for example, the difference between the three-month money market rate and the return on M3 assets) likewise leave a major part of monetary growth since 2001 unexplained. This also seems to be the case when considering the possibility that the longstanding historically low interest rate level may have heightened the demand for liquidity on a disproportionately large scale.<sup>4</sup>

*Signs of instability in traditional money demand models*

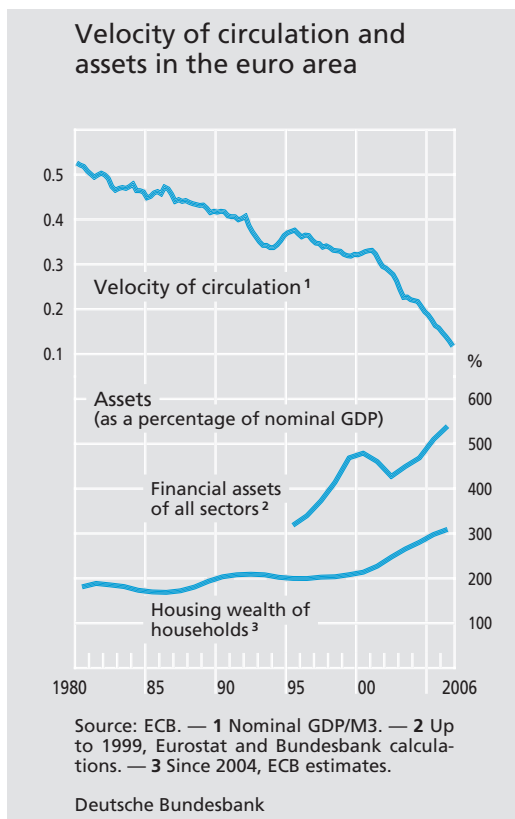
## The relationship between money and wealth

An alternative approach to explaining the sharp monetary growth incorporates developments in the asset markets. Money is a store of value and, as such, it serves as an al-

*Asset markets with influence on liquidity conditions*

<sup>3</sup> See C Greiber and W Lemke, Money demand and macroeconomic uncertainty, Deutsche Bundesbank Research Centre, Discussion paper, Series 1, No 26/2005.

<sup>4</sup> When specifying a money demand, this phenomenon can be taken into account by formulating a non-linear relationship between the money stock variables and the interest rate variables or opportunity cost variables.



alternative to holding other assets such as housing or financial wealth. As a result, higher wealth will prompt households and enterprises to hold higher money stocks, since these are ultimately part of their respective total assets.<sup>5</sup> No explicit consideration of this is needed in the monetary analysis, as long as there is a close interrelationship between income and wealth developments, since the impact of wealth is, so to speak, simultaneously captured by income. However, things become more difficult if income and wealth developments diverge, for example, in periods of fairly large price fluctuations between assets and non-durable goods. A simple analysis of the money-price relationship, which does not take explicit account of such a development in the asset markets, then harbours the risk of misinterpretations.

## Price developments in the asset markets

In actual fact, the macroeconomic development of the past few years in many countries, including the euro area, has been characterised by a very sharp increase in the price of assets, such as real estate or shares, which significantly outpaced the inflation of consumer goods. It cannot be ruled out that this development also has some connection with the abundant liquidity that exists worldwide. Many observers even see the increase in asset prices as the result of liquidity spilling over to certain asset markets.<sup>6</sup>

*Relative price shift between consumer goods and assets ...*

The fact that consumer goods prices have risen on a much smaller scale than asset prices in the past few years is also said to be attributable to possible price-dampening effects of globalisation. The increasing integration of many emerging market economies into the global economy has increased the supply of trade products, intensified competition in the product markets and, thus, put pressure on the consumer goods prices. At the same time, the looming migration of production plants to countries with more favourable labour market and production conditions has restricted the scope for inflationary wage increases.<sup>7</sup> The outcome of this may have been that the ample liquidity has tended to

*... may be due to globalisation*

5 See D Gerdesmeier, The role of wealth in money demand, Economic Research Group of the Deutsche Bundesbank, Discussion paper, No 5/1996.

6 See R Adalid and C Detken (2007), Liquidity shocks and asset price boom/bust cycles, ECB Working Paper, No 732.

7 See K Rogoff (2004), Globalization and Global Disinflation, in Federal Reserve Bank of Kansas City, Monetary Policy and Uncertainty: Adapting to a Changing Economy, Conference volume for the Jackson Hole Symposium 2003, pp 77-112.

lead to price increases in the case of goods that display a lower elasticity of supply. In view of the rigid supply, the price of land is especially susceptible to fluctuations in demand. In the case of shares and bonds, the price increase is also often said to be due to the high demand of Asian and/or oil-exporting countries for investment that promises a return.<sup>8</sup>

*Relationship  
between  
money and  
real estate ...*

From a monetary policy perspective, it is of particular interest whether and to what extent the rising asset prices have driven monetary developments and vice versa. In particular, the increase in house prices and, thus, housing wealth may have been reflected in higher monetary growth, since real estate transactions, lending and money creation are closely related. For example, if there is increased activity in the real estate market, the associated financing of these transactions typically leads to increased lending. As long as the central bank does not take countermeasures, this involves money creation.

*... more  
clear-cut than  
for other assets*

By contrast, the relationship between monetary developments and other assets, such as shares or fixed-income securities, is less pronounced or of a more short-term nature. One of the reasons for this is that the relationship between the developments in the securities markets and money holdings is not clear-cut. On the one hand, stock price rises tend to increase households' assets, and a part of the associated asset growth may be held in the form of money. On the other hand, high (expected) securities returns make the holding of securities more attractive than holding money. This may trigger substitution effects,

ie shifts from money to securities, which *per se* reduce money holdings.

### **Relationship between real estate market and monetary developments**

On the basis of these considerations, it should be advantageous to concentrate first on the specific relationship between money and housing wealth when analysing the general relationship between money and wealth developments. This does not mean that other assets can be neglected in the monetary analysis.<sup>9</sup> However, it may be assumed that, owing to the more clear-cut relationship between housing wealth and money, the relationships become more apparent there than for financial assets. The question of whether the real estate market developments can be used to explain the sharp decline in the velocity of circulation in the euro area in the past few years, ie the sharp monetary growth, is therefore to be examined below.

The special importance of real estate for monetary developments stems mainly from its role as important collateral when issuing bank loans ("collateralisation relationship"). Since banks are informed only incompletely about the quality and behaviour of their debtors, ie about their creditworthiness and pay-

*Real estate as  
loan collateral*

<sup>8</sup> See B S Bernanke, The Global Saving Glut and the U.S. Current Account Deficit, Speech at the Homer Jones Lecture, St. Louis, Missouri, 14 April 2005.

<sup>9</sup> In the past, it was possible to observe periods with a distinct relationship between share prices and money holding. As already mentioned, the monetary dynamics between 2001 and mid-2003, for example, were largely shaped by households' asset shifts from shares to more secure, liquid forms of investment. This is also an example of the substitution relationship between shares and money.

ment behaviour,<sup>10</sup> it is crucial from their point of view whether a debtor has sufficient collateral to cover the default risk. In this case, real estate is of particular importance because it is relatively stable in value and comparatively objective in terms of evaluation.<sup>11</sup> An increase in housing wealth increases the creditworthiness of a borrower and thus tends to lead to an improved availability of credit. This may produce accelerator effects if the improved availability of credit gives an added stimulus to the real estate market and the resulting house price increases make the availability of credit even easier. In the economic literature, this relationship is known as the “financial accelerator”, since it gives a further boost, for example, to the stimulating effect of an interest rate cut owing to an expansionary monetary policy or a cyclically induced rise in house prices. Since lending and money creation are closely linked through the banking system, such credit channel effects also imply a close relationship between monetary and real estate developments.

*Further transmission channels between money and real estate*

In addition to this collateralisation relationship, there exist further transmission mechanisms between money variables and real estate market variables, which can be divided into two categories. The first comprises money demand motives (“money demand relationship”), according to which monetary growth is causally dependent on real estate market developments. The second covers the role of liquidity in the financing of real estate transactions and, thus, the causal role of money in the development of house prices and other asset prices (“asset inflation relationship”). If existing money holdings are used for acquiring

real estate, housing wealth is influenced through house prices.

The complex transmission mechanisms between developments in the real estate market and money demand can be attributed mainly to three relationships: asset, substitution and transaction effects.<sup>12</sup> A rise in house prices increases the wealth of the economic agents. Because of this, there is a rise in demand for the individual components of the investment portfolio, which also includes liquid funds in the form of money. A substitution effect may occur if risen yield expectations in the real estate sector cause the economic agents to invest more in real estate at the expense of their money holdings. However, this negative relationship between house price developments and money holdings is likely to be only of secondary importance. Owing to the high transaction costs associated with acquiring real estate, real estate would probably show a significantly lower degree of substitution for money than do bonds or shares, for example.

*Money demand relationship*

By contrast, the pure transaction aspect plays a greater role. Rising house prices are usually associated with increased activity in the real estate market. The greater turnover is accompanied by a higher demand for transaction balances. Thus, owing to the positive asset and transaction effects and the likely second-

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<sup>10</sup> See N Kiyotaki and J Moore (1997), *Credit Cycles*, *Journal of Political Economy*, Vol 105, No 2, pp 211-248, and Deutsche Bundesbank, *Bank balance sheets, bank competition and monetary policy transmission*, *Monthly Report*, September 2001, pp 51-70.

<sup>11</sup> See M Iacoviello (2005), *House Prices, Borrowing Constraints, and Monetary Policy in the Business Cycle*, *American Economic Review*, Vol 95, No 3, pp 739-764.

<sup>12</sup> See M Friedman (1988), *Money and the Stock Market*, *Journal of Political Economy*, Vol 96, No 2, pp 221-245.

ary importance of the substitution relationship, the expected result is that the demand for money is positively influenced by the development of house prices and housing wealth: rising house prices and rising housing wealth tend to increase the demand for money.

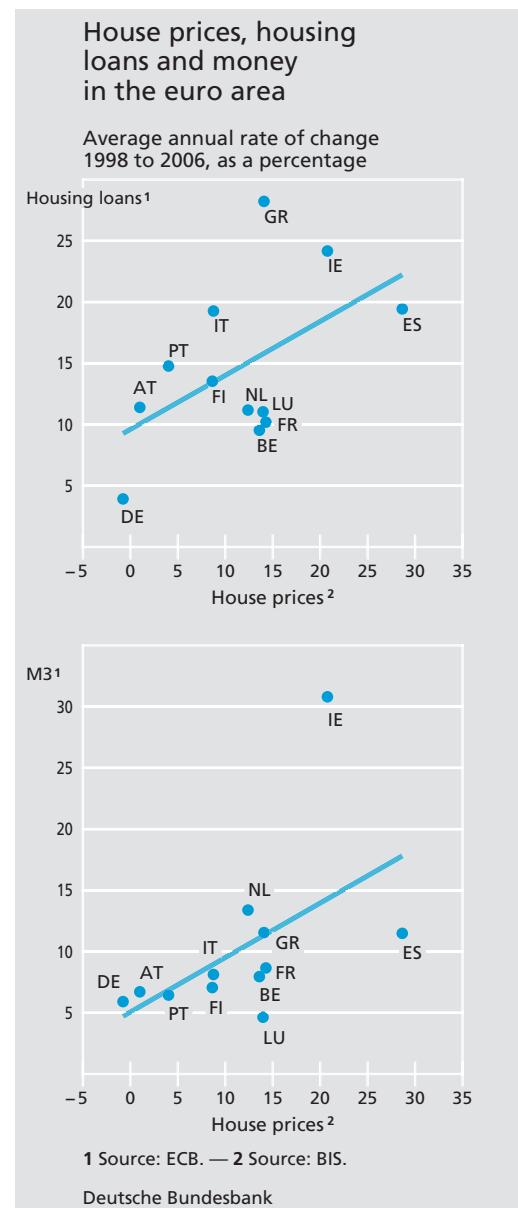
*Asset inflation relationship*

In the thoughts set out above, what happens in the real estate market was causal for monetary developments. In principle, however, monetary factors may, conversely, also impact on house prices and housing wealth. For example, an expansionary monetary policy can lead to an increased demand for assets, such as real estate. A generous supply of liquidity would thus tend to increase house prices and, therefore, also housing wealth. In a period in which the supply of consumer goods is very flexible owing, for example, to an increasing international division of labour or major technical progress, there is also likely to be a price shift between non-financial assets and consumer goods. Especially in times of improving economic activity, in which sufficient financial resources are available, house prices should rise in relation to the general consumer price index.<sup>13</sup>

*Positive theoretical relationship between money and real estate*

In sum, there exist complex transmission mechanisms between monetary developments and the real estate market, with the preceding theoretical considerations, overall, suggesting a positive relationship. Only the already weak substitution effect appears, by itself, to have a negative relationship.

In actual fact, the presumed positive relationship is confirmed by an initial look at the data



(see chart on this page). Countries with high growth rates for house prices, such as Spain, Ireland or Greece, also show high growth rates for real estate loans and the national contributions to M3.<sup>14</sup> Conversely, especially

<sup>13</sup> See J Poterba (1984), Tax Subsidies to Owner-Occupied Housing: An Asset Market Approach, Quarterly Journal of Economics, No 99, pp 729-752.

<sup>14</sup> The national contributions to M3 do not cover bank-notes in circulation. However, this accounts for no more than 7% of M3.

in Germany, stagnating house prices as well as a decidedly weak demand for real estate loans were recorded. Moreover, Germany contributed only to a relatively small extent to monetary growth in the euro area. Furthermore, the national contributions to the monetary growth show a greater correlation with house prices than the national developments in lending for house purchase. This might suggest that not only the collateralisation relationship related to lending, but generally also the broader money demand relationship and/or the asset inflation relationship could be relevant.

### Econometric analysis of the relationship between money and the real estate market

*Empirical relationship between money and real estate variables*

Against the backdrop of the discussion above, two aspects, in particular, are of interest concerning the empirical relationship between monetary developments and the real estate market. First, it has to be examined whether there is any significant correlation at all between money and house prices or housing wealth. Second, the theoretical considerations have made clear that such a correlation may reflect differing economic relationships. From a monetary policy perspective, the key issues are whether monetary developments react solely to the real estate markets, whether monetary developments drive house prices and housing wealth, and whether the reinforcing effects of the collateralisation relationship are present. Fundamentally, it is also possible that all of these causal relationships exist simultaneously.

These questions can be analysed using econometric procedures. The empirical findings clearly reveal a positive long-term relationship between M3 and house prices and/or housing wealth. The results show that money demand relationships play a major role: monetary developments depend in a significantly positive way on the real estate market variables. By contrast, the empirical results are less clear for the asset-inflation relationship. Accordingly, no significant transmission mechanism from money to house prices can be demonstrated for the euro area. However, with reference to housing wealth, evidence for such a relationship is found. Therefore, it cannot fundamentally be ruled out that the monetary dynamics in the euro area are also a causal factor for developments in the real estate market.

*Identification of several causal relationships*

While this analysis is geared mainly to the longer-term relationship between the real money stock and the real housing variables or to the identification of the causal relationships, the dynamic adjustment of the individual variables following a shock is also of interest. The results of such a simulation based on the econometric estimates may be represented in the form of "impulse response" functions. These functions help to provide information on the path of the respective variable in response to changes of another variable (see adjacent chart).<sup>15</sup> The simulations are based on estimated VAR systems, which, in addition to the variables used for the purposes of the above cointegration analysis (real M3, real GDP, yield of government

*Adjustment dynamics*

<sup>15</sup> The confidence intervals were calculated using bootstrap methods.



## The relationship between money and the housing market in the euro area

The long-term relationship between monetary and housing market dynamics in the euro area is captured using the following equation, which forms part of a vector error correction model (VEC).<sup>1</sup>

$$(1) M3r_t = \alpha_0 + \alpha_1 \cdot GDP_t + \alpha_2 \cdot INT_t + \alpha_3 \cdot I\_Var_t + \varepsilon_t.$$

$M3r$  stands for real  $M3$ , calculated using the GDP deflator, while  $GDP_t$  represents real gross domestic product and  $INT_t$  is the interest return on a ten-year government bond. Two alternative variables were used for the housing market variable  $I\_Var_t$ : the real house prices  $I\_Price_t$  and households' real housing wealth  $I\_Wealth_t$ . The residual  $\varepsilon_t$  captures that part of the real money holdings that cannot be explained by the cited determinants. With the exception of the interest rate variable, all the variables were transformed into logarithms. The sample comprises quarterly data from the first quarter of 1981 to the fourth quarter of 2006.<sup>2</sup> The housing market variables are based on the house price index of the macroeconomic database of the Bank for International Settlements (BIS) and ECB estimates of households' housing wealth.<sup>3</sup> Both of the time series which are available only on an annual basis were converted into quarterly figures. Finally, the long-term relationship (1) is embedded in an equation system which captures the short-term adjustment processes of the observed variables. The resulting error correction mechanisms, that is the reaction to deviations  $\varepsilon_t$  from the long-term equilibrium, provide valuable information on the directional impact among the observed variables.

Cointegration tests show that there is a long-term relationship between these variables. The table shows the estimated coefficients of the long-term relationship as well as the adjustment coefficients  $ec_{t-1}$  of the error correction mechanisms, both when using house prices (middle column) and, alternatively, using housing wealth (right-hand column). The estimated parameters of the long-term relationship are all significant and show the expected signs: an increase in GDP boosts money holdings and a higher interest rate lowers real M3 owing to the higher opportunity costs of holding money. With regard to the relationship between money and housing, two results are of particular interest. First, the estimation parameters of the housing variables are, as expected, unambiguous and significantly positive. Secondly, the estimated adjustment coefficients of the error correction terms provide indications of the causal direction of this relationship.

<sup>1</sup> See C Greiber and R Setzer (2007), Money and housing – evidence for the euro area and the US, Deutsche Bundesbank Research Centre, Discussion Paper, Series 1, No 12/2007, forthcoming. — <sup>2</sup> These data are based on An Area-Wide Model (AWM) for the Euro Area, ECB working paper

### Cointegration analysis, euro area

Long-term relationship:

$$M3r_t = \alpha_0 + \alpha_1 \cdot GDP_t + \alpha_2 \cdot INT_t + \alpha_3 \cdot I\_Var_t + \varepsilon_t$$

Term	House prices	Housing wealth
Long-term coefficients		
$GDP_t$	0.32* (0.12)	0.59* (0.08)
$INT_t$	-2.55* (0.39)	-0.48* (0.17)
$I\_Price_t$	0.84* (0.08)	
$I\_Wealth_t$		0.48* (0.03)
Constant	-2.18	-10.21
Short-term adjustment coefficients		
$ec_{t-1}^{M3r}$	-0.06* (0.02)	-0.07* (0.03)
$ec_{t-1}^{BIP}$	-0.06 (0.03)	0.16* (0.03)
$ec_{t-1}^{INT}$	-0.07* (0.02)	-0.01 (0.02)
$ec_{t-1}^{I\_Price}$	-0.01 (0.03)	
$ec_{t-1}^{I\_Wealth}$		0.05* (0.02)

Standard errors (in parentheses); \* significant, 5% level;  $ec_{t-1}^X$  – error correction term in the differential equation for the variable X.

In line with the money demand interpretation, the adjustment coefficients of the money equations are significantly negative for both specifications. This means that deviations of the money stock from its long-term equilibrium value trigger a correction process which leads back to the equilibrium value determined by the fundamentals. Moreover, the estimates of the adjustment coefficients for house prices  $ec_{t-1}^{I\_Price}$  and for housing wealth  $ec_{t-1}^{I\_Wealth}$  indicate that the relationship between wealth and inflation is also relevant. The corresponding parameter is significant only for specification (2) based on housing wealth. However, the positive sign in this case suggests that the excess liquidity – in the sense of money holdings which are too high in comparison with the explanatory variables – increases housing wealth. The differing results for the two specifications in this estimate could be due to the fact that this effect was not observable in all the euro-area countries and, therefore, exists only in an attenuated form when viewed in the aggregate analysis.

no 42, by Gabriel Fagan, Jérôme Henry und Ricardo Mestre (2001) and on the official ECB statistics. — <sup>3</sup> See European Central Bank (2006), "ECB estimates of Euro Area Capital Stock and Households' Housing Wealth", mimeo.



bonds as well as real house prices or, alternatively, real housing wealth) also consider the real loans to the private sector as well as the three-month money market rate. This is designed to verify whether the real estate-money relationship merely reflects the influence of loans – as assumed in the collateralisation relationship – or whether there are also independent relationships between money and real estate, as are expressed in the money demand relationship and in the asset inflation relationship.

The first impulse response function shows that, after an increase of real M3, real house prices rise steadily for about 14 quarters and then remain at the higher level. The confidence bands, which model the statistical uncertainty of this simulation, indicate that this positive response of the house prices will be statistically significant after about eight quarters. The effects of monetary expansion on house prices in the euro area thus do not occur immediately, but they can be demonstrated over longer horizons. By comparison, higher real house prices lead, without a time lag, to a significant increase in real money holdings. The analogous simulations for housing wealth confirm these results. All in all, this means that the results of the error correction analysis are largely confirmed within the context of this extended model. This suggests that there are also direct significant interactions between money and real estate market variables, which are independent of developments in loans.

## Real estate markets and monetary policy

*Money demand and velocity of circulation still stable*

The results of the empirical analysis have two implications for the monetary analysis. First, it may be assumed that the money demand relationship in the euro area and, therefore, the velocity of circulation remain stable if real estate market developments are taken into account. In an extended approach, monetary developments can still be explained satisfactorily using real income, interest rates and real estate market variables. Thus, the analytical tools of a quantifiable money demand function and a stable velocity of circulation, which are important in the context of the monetary analysis, are still usable – albeit in a modified form.

*Relationship between house prices and consumer prices*

Moreover, the results indicate that real estate market developments are significantly influenced by monetary developments. In this context, the question arises as to how and how far house prices should be taken into consideration by monetary policymakers. The answer to this question depends on the precise relationship between house prices and consumer price inflation, which is the target variable of the Eurosystem's monetary policy.

There are two aspects to this. One is that there are direct statistical relationships created by the impact that house prices have on the cost of living. For example, if house prices are fairly high, the cost of living also tends to be higher – either in the form of rising hous-

### An empirical analysis of the relationship between money and the real estate market in the USA

Firstly, the analysis of US data can be used to examine the robustness of the links between money and housing market variables found in the euro area. Secondly, the example of the USA could provide some clues as to the direction the relationship between money and housing might take if financial instruments such as are commonly used in the US were to become more widespread in the euro area. Finally, the results for the USA are of interest, given the significance of global liquidity developments and their impact on the real estate markets.

The long-term relationship between monetary and real estate market developments in the USA is specified in much the same way as for the euro area.<sup>1</sup> The results of the estimation are even clearer than the findings for the euro area. Thus, a long-term relationship between the money stock and housing market variables exists for the USA as well. Moreover, it is possible to identify clearly not only a money demand relationship but also an asset inflation relationship. Real estate prices and housing wealth are both influenced significantly by monetary developments, ie excess liquidity drives the real estate markets.

Overall, it may be concluded that the relationship between money and the real estate market is not a phenomenon that is confined to the euro area.

<sup>1</sup> For a more detailed account of the specifications and results, see Claus Greiber and Ralph Setzer, Money and housing – evidence for the euro area and the US, Deutsche Bundesbank Research Centre, Discussion Paper, Series 1, No 12/2007, forthcoming.

ing rents or in the form of rising acquisition costs of owner-occupied housing.<sup>16</sup>

Second, there are indirect relationships. For example, increased housing wealth may increase demand for consumption and investment and thus influence consumer prices.<sup>17</sup> As described above, this can be accounted for by the collateralisation relationship, where rising house prices facilitate access to loans that can be used for consumption and investment spending. Moreover, an increase in housing wealth may also have the effect that economic agents consider themselves richer overall and therefore increase their consumption spending.

These relationships have implications for monetary policy. First, they influence the monetary policy transmission process – monetary policy measures may exert their effects on price developments through house prices and through housing wealth as well.<sup>18</sup> Furthermore, an excessive increase in house prices may weaken financial stability, which ultimately would also be associated with negative implications for aggregate demand

and the stability of consumer prices in the euro area. The ongoing analysis of growth in lending and monetary aggregates combined with asset price developments can provide important clues as to whether such financial imbalances are building up.

Both implications make it advisable for central banks to increase rather than scale back their research in the area of monetary analysis. It is only in this way that they will be able to take better account of the complex reciprocal medium to long-term transmission relationships between real economic activity, on the one hand, and money market and financial market dynamics, on the other.

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<sup>16</sup> This makes it advisable to take house prices into account when calculating the consumer price index. However, owner-occupied housing has so far not been included in the HICP. Only housing rents are recorded. This is for technical data reasons, although it is problematic from a monetary policy perspective, since this means that the prices for the durable “owner-occupied housing” are not considered when measuring inflation in the euro-area HICP.

<sup>17</sup> See C Goodhart and B Hofmann (2007), *House Prices and the Macroeconomy: Implications for Banking and Price Stability*, Oxford University Press.

<sup>18</sup> See A Filardo (2004), *Monetary Policy and Asset Price Bubbles: Calibrating the Monetary Policy Trade-Offs*, Bank for International Settlements, Working Paper No 155.