Asset prices: relationships with demand factors and credit, and implications for monetary policy

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Introduction

The middle of the last decade was marked in France by financial deregulation, and the years that followed saw a sharp increase in the price of equities and property in Paris, a substantial decline in the household saving rate and an acceleration in corporate investment. This chronological account might suggest that pronounced wealth effects are at play in France, and that there may be a link between financial deregulation and rising asset prices, probably through an expansion of lending to asset buyers.

The aim of this paper is to compare these theories with the available data. The latter do not validate the hypothesis of a wealth effect. It does not appear possible to show a statistical relationship between household consumption and equity prices; the rise in residential property prices may not have appreciably affected the whole of the country but appears to have been confined to Paris; the increase in lending has been markedly greater than that in productive investment (firms' gross fixed capital formation), and this development may have contributed to the rise in commercial property prices.

Even if there is no direct relationship between asset prices and demand factors, movements in asset prices may have an effect on the transmission of monetary policy if, by changing banks' balance-sheet positions, they affect the relationships between market rates and lending rates. It is conceivable that, following a deterioration in their balance-sheet strength linked to a downturn in the value of the collateral for their loans, banks will pass on reductions in market rates less widely. Contrary to this theory, the adjustment of lending rates to market rates has become less and less sluggish in recent years.

1. Equity holdings of households[2]

Stock market capitalisation in France stood at FF 3,073 billion in December 1996 and FF 2,415 billion at the end of 1994, or 33% of GDP. Capitalisation is lower than in the United States, where it amounted to $6,049 billion at the end of 1994, or 87% of GDP. Moreover, the share of capitalisation accounted for by households is much smaller in France: whereas 64% of quoted shares were controlled by households in the United States (including pension funds' holdings of equities), the ratio was at most 30% in France (including share portfolios of UCITS held by households).[3]

Not very much is known about the equity holdings of French households. At the end of 1994, according to the Bank of France's securities survey, listed French shares (and share-based UCITS) held by households amounted to FF 443.4 billion (of which FF 128.7 billion in share-based UCITS). As the overall coverage of this survey was 61.4% of stock market capitalisation, households'

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capital in listed shares can be put at a little over FF 700 billion, or approximately 30% of stock market capitalisation.[4] Total holdings of equities by French households are therefore much lower than those of US households.

With regard to the concentration of equity holdings, in the United States the 10% of households with the largest equity portfolios accounted for 90% of total holdings of equities by households; the 12% of US households with the highest income held 58% of the total equity stock, including pension funds, in 1992 (Poterba and Samwick, 1995, Tables 9 and 10). In France, according to INSEE's financial assets survey of 1992, the wealthiest 10% of households (in terms of total financial wealth, ranging from equities to cheque accounts) accounted for 86% of total securities held by French households (Arrondel, 1996, Table 9C, p. 54). It is likely that the concentration is even greater for shares alone. Taking income and total financial wealth as equivalent criteria for classifying households for purposes of international comparison, it appears that the concentration of equity holding is greater in France than in the United States.

Taking account of the concentration of equity holdings, a wealth effect from a rise in equity prices should be reflected in a relative increase in the consumption of products purchased by the wealthiest households. Such a correlation does not appear in the United States. Poterba and Samwick (1995, p. 297) do not find any wealth effect from equity prices on household consumption and conclude that the positive correlation between equity prices and total consumption is due to the fact that price movements act as a leading indicator. The issue of the correlation between equity prices and household consumption in France is addressed in the following section.

2. Equity prices and household consumption[5]

The rise in equity prices on the Paris Stock Exchange was particularly sharp from 1985 to 1990. It can be seen from Figure 1 that stock market prices increased more rapidly in Paris than in New York, London or Frankfurt over this period. At the same time, the saving rate of French households declined considerably, which suggests that there is a statistical relationship between equity prices and household consumption.

The first run to test the relationship between the saving rate and the boom in the stock exchange is to regress the quarterly growth rate of household consumption on past real growth rates of the French equity index. From Table 1, it can be seen that the (almost) significant effect of the increase in equity prices disappears when the dummy for the last quarter of 1974 is introduced.[6]

When income is introduced to estimate the usual ECM consumption à la Hendry, the coefficient of the increase in the real stock index remains insignificant.[7]

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[4] 443.4 billion divided by 0.614 gives 722.1 billion. This information is from Chocron and Marchand (1995, pp. 161 and 165). This estimate overstates households' equity wealth as the coverage of the securities survey, conducted among banking establishments which manage securities accounts, was probably higher for households than for other agents. According to the quarterly financial operations tables, households held FF 779 billion of listed French shares (excluding share-based UCITS) at the end of 1994. Arrondel et al. (1996, p. 158) present the various estimates of the equity wealth of French households and prefer the total calculated on the basis of the replies to the Bank of France's securities survey, which is close to that calculated using the replies to the financial assets survey conducted among households by INSEE.
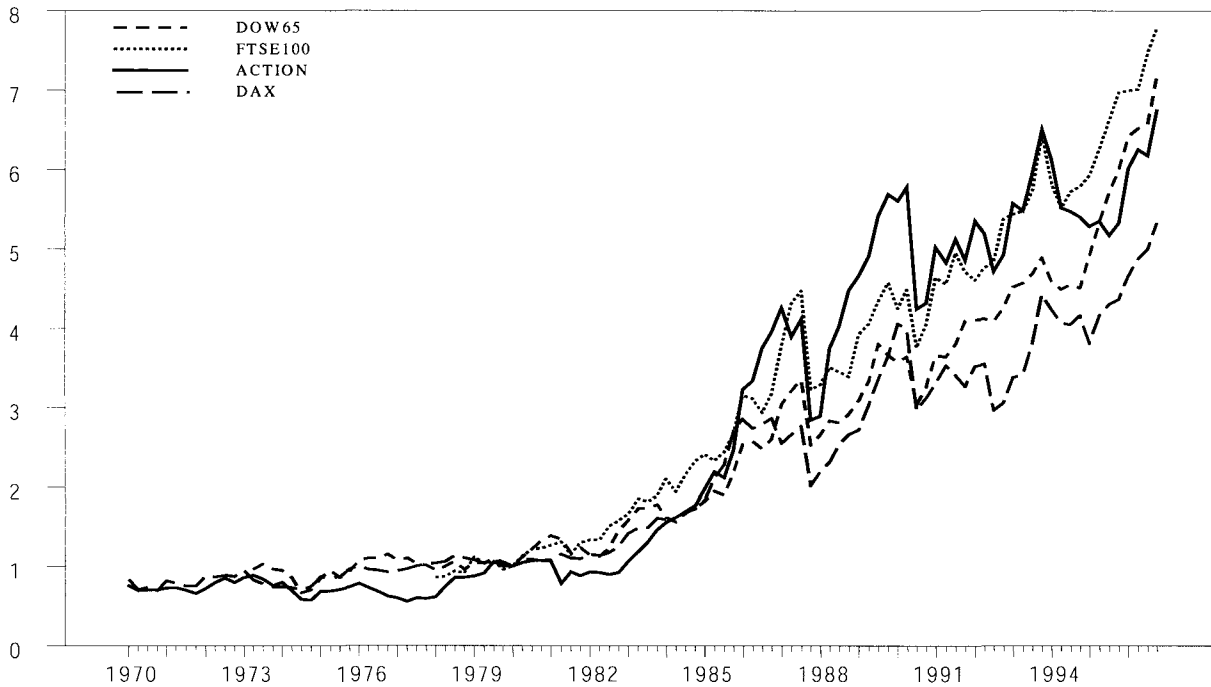
[5] The regressions in this section were carried out by Jean-Pierre Villetelle.

[6] This dummy is introduced since measured consumption is an outlier owing to strikes.

[7] This equation does not model consumption as a function of financial wealth since the stock index is not included in the correction term.

Figure 1

Nominal stock exchange indices

Note: All the indexes have been rebased to 1 in 1980:Q1. ACTION is the SBF250 index after 1990:Q4. From 1987:Q3 to 1990:Q4 it follows the growth of CAC40. Before 1987:Q3 it follows the index for French assets with variable earnings published in the *Bulletin mensuel de statistique*.

Table 1

Estimations from 1974:1 to 1995:4

	E0		E1		E2	
	Coeff.	**t-stat.**	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
a_0	0.0057	7.3	0.0056	7.2	0.0058	7.6
w_0	-0.0068	-0.9				
w_1	0.0083	1.1				
w_2	0.0150	2.0	0.0139	1.9	0.0110	1.5
w_3	-0.0048	-0.6				
w_4	-0.0083	-1.1				
k_0					-0.015	-2.1
DW	2.1		2.1		2.1	
SER (%)	0.73		0.73		0.71	
R^2	0.42		0.40		0.43	

Regression of quarterly consumption growth (Δlog C) on current and lagged values of real growth of stock index (Δlog $Icact$), given by:

(E0): $\Delta \log C = a_0 + w_0 \Delta \log Icact + w_1 \Delta \log Icact_{-1} + w_2 \Delta \log Icact_{-2} + w_3 \Delta \log Icact_{-3} + w_4 \Delta \log Icact_{-4}$

(E1): $\Delta \log C = a_0 + w_2 \Delta \log Icact_{-2}$, which is equation (E0) after suppression of the non-significant terms.

(E2): $\Delta \log C = a_0 + w_2 \Delta \log Icact_{-2} + k_0 D_{74:4}$, which is equation (E1) with a dummy variable in 1974:4.

An equation which includes a dummy variable equal to 1 from 1986 to 1990 (Ea3, in Table 2), shows that the saving rate was abnormally low in relation to income and inflation during this period. This episode is not linked to equity prices (the coefficient of the increase in the real share price index is very far from being significant) but to the expansion in consumer credit, which was one important aspect of the financial liberalisation of this period.

These regressions show that neither the crude regression of consumption growth on stock index growth, nor specifications of consumption in terms of income and variables taking account of the financial deregulation of the mid-1980s (discussed in Sicsic and Villetelle (1995)) indicate any significant influence of stock prices on households' consumption in France.

Table 2

Estimations from 1974:1 to 1995:4

	Ea		Ea with 1974:4 dummy		Eac		Ea3	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
a	-0.11	-4.7	-0.11	-5.5	-0.15	-12.3	-0.15	-16.1
b	-8.58	-2.8	-8.10	-3.1	-5.81	-4.3	-4.64	-4.7
c	-0.09	-2.8	-0.10	-3.2	-0.15	-4.6	-0.17	-5.0
d	-2.55	-3.3	-2.41	-3.5	-2.21	-5.0	-1.81	-4.7
w_2	0.0134	1.9	0.0106	1.5	0.0066	1.0	0.0041	0.6
$-w_2/c$	0.15		0.11		0.04		0.02	
e					3.55	3.7	1.46	1.7
$100\,u$							3.34	2.7
k			-0.016	-2.3			-0.017	-2.7
DW	2.26		2.27		2.40		2.48	
SER %	0.67		0.65		0.63		0.60	
R^2	0.50		0.53		0.56		0.62	

Regressions of consumption on income (R) and inflation ($\Delta\log p$), augmented by the growth rate of the stock index ($\Delta\log Icact$), such that:

(Ea): $\Delta\log C = -ac + (1-cb)\Delta\log R + c\log\dfrac{C_{-1}}{R_{-1}} - dc\Delta\log p + w_2\Delta\log Icact_{-2}$

(Eac): $\Delta\log C = -ac + (1-cb)\Delta\log R + c\log\dfrac{C_{-1}}{R_{-1}} - dc\Delta\log p + w_2\Delta\log Icact_{-2} + e(1-cb)\dfrac{\Delta CRT}{pR} + e(-1+cb-c)\left(\dfrac{\Delta CRT_{-1}}{p_{-1}R_{-1}}\right)$,

which is equation (Ea) augmented by consumer credit variation (ΔCRT).

(Ea3): $\Delta\log C = -ac + (1-cb)\Delta\log R + c\log\dfrac{C_{-1}}{R_{-1}} - dc\Delta\log p + w_2\Delta\log Icact_{-2} + e(1-cb)\dfrac{\Delta CRT}{pR} + e(-1+cb-c)\left(\dfrac{\Delta CRT_{-1}}{p_{-1}R_{-1}}\right)$

$-cuD_{86-90} - ckD_{74:4}$,

which is equation (Eac) augmented by a dummy variable for 1986:1-1990:4 and by a dummy variable in 1974:4.

3.   Lending and property prices

Property prices in Paris increased sharply at the end of the 1980s. The average price per square meter, according to the Paris Chamber of Notaries, doubled from 1985 to 1990, after account is

taken of the rise in consumer prices. However, in general, residential property prices in France followed the pattern of inflation according to the Mouillart series (1997).[8]

Commercial property prices were calculated on the basis of data supplied by the Direction Générale des Impôts on average transaction values for each Paris arrondissement and for some other cities.[9] For each locality, two types of transaction values are available: for "luxury" offices and for "standard" offices. Four series were calculated by combining the locality (Paris/provinces) and the type of office (weighted according to the number of transfers of ownership), and then a simple average of these four series (divided by the consumption deflator and rebased to 1 in 1981) represents the real value of commercial property in France. The commercial property prices in Paris tripled from 1981 to 1990 and were, in 1987 and in 1995, 40% above their 1981 level.

Figure 2

Inflation-adjusted property price indices
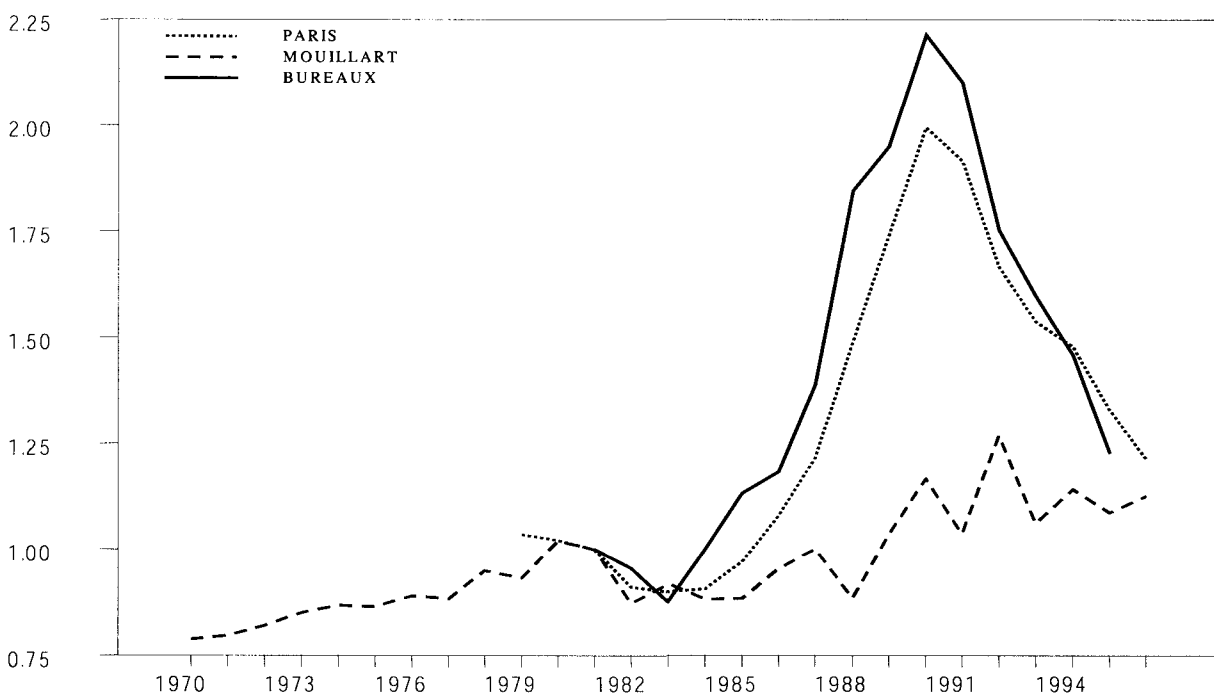
Note: PARIS is the mean price of housing transaction according to the Paris Chamber of Notaries; MOUILLART is the index of housing for France kindly provided by Mouillart (1997); BUREAUX is the computed index for office building from data provided by the DGI. All indexes have been divided by the consumption deflator, and rebased to 1 in 1981.

The moderate and steady rise in the real price index for residential property for the whole of France (13% from 1981 to 1996; see Figure 2) shows that no wealth effects can be sought there. On the other hand, the strong increase observed in commercial property prices between 1985 and 1990, precisely at the time of financial deregulation, raises the question of whether there may be a relationship between credit expansion and rising asset prices.[10]

[8] This series will be taken up in the forthcoming national wealth accounts base (Moreau (1997)).

[9] Thierry Grunspan kindly provided us with the unpublished data he obtained from the Direction Générale des Impôts, data which he has independently used in Grunspan (1997).

[10] This is the basic idea advanced in the case of France, in particular by Borio, Kennedy and Prowse (1994).

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Table 3

Average annual growth rates and contributions to the growth of total bank lending

In percentages

	1978–85		1985–91		1991–96	
	Growth rate	Contribution	Growth rate	Contribution	Growth rate	Contribution
Cash facilities for firms	10.18	1.64	10.45	1.46	-0.68	-0.09
Exports	5.15	0.26	-15.89	-0.24	-12.31	-0.05
Investment by firms	14.87	2.67	9.53	1.86	-2.90	-0.52
Investment by other agents	11.40	2.00	6.79	1.12	1.62	0.23
Consumer credits	17.59	0.54	18.37	0.94	4.63	0.29
Housing credits (home buyers)	13.71	4.94	7.02	2.50	2.06	0.66
Housing credits (developers)	-2.51	-0.01	49.58	0.52	-18.99	-0.36
Other lending	7.79	0.23	22.45	0.98	-12.39	-0.55
Doubtful debt	32.78	0.37	24.92	0.64	12.67	0.64
Total	12.61		9.75		0.22	

Figure 3

Investment credits, investment and construction indices
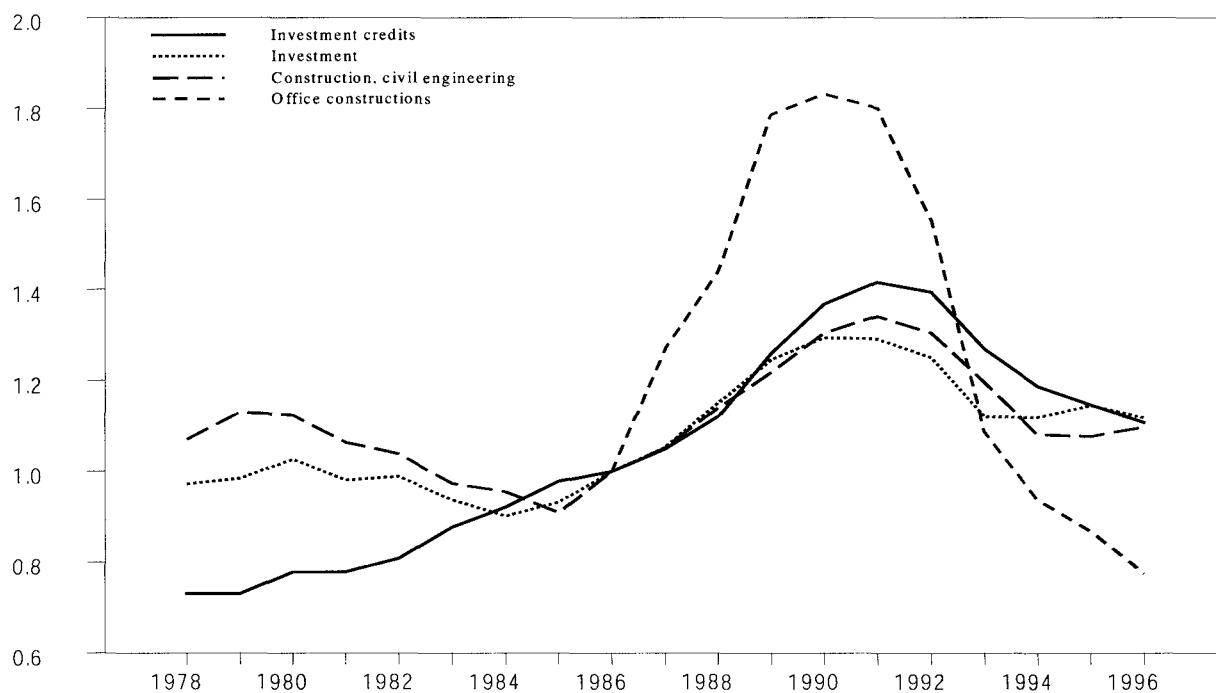
Note: Investment credits is an index of investment credits to firms; Investment is the gross capital formation of enterprises; Construction, civil engineering. is the gross capital formation of enterprises in construction and civil engineering; Office constructions is the number of new office constructions. The three first series have been divided by the consumption deflator.

Lending grew sharply between 1985 and 1991 (by 9.8%, compared with 12.6% in 1978-85; average inflation rates were 2.5% after 8.9%). Property development credit increased on average by almost 50% a year between 1985 and 1991, with the bulk of the expansion coming between 1988 and 1991. The total of such property development credit has always been limited (FF 175 billion in 1991, whereas other housing credits amounted to FF 1,996 billion). It should be emphasised that loans for financing residential or commercial property transactions carried out, for example, by property managers are classified, for the purpose of the monetary statistics, as corporate investment credits. These credits increased by 9.5% per annum from 1985 to 1991, more rapidly in real terms than from 1978 to 1985 (7%, compared with 6%).

Figure 3 shows that the increase in investment credits from the monetary statistics has been larger than the increase in the gross fixed capital formation by enterprises. With the self-financing ratio improving, the amount to be financed by external funds has actually declined since 1982. The increase in "investment" credits has obviously permitted other types of transactions than gross fixed capital formation. The number of new office constructions has, interestingly, followed the price of commercial property.

The stance of monetary policy was not accommodating in the mid-1980s, judging by the level of real interest rates. In view of the expected rates of return on asset holdings, the prices of which were rising sharply, the demand for credit is not very sensitive to interest rates, which are bound to be a good deal lower than these rates of return. The most famous historical example is that of the stock market boom in the United States between 1926 and 1929 which, according to White (1990, pp. 159 and 164), developed under a tight monetary policy and attracted funds through the reallocation of credit on the financial markets.

4.   Transmission of short-term market rates to lending rates[11]

A potentially dangerous effect of asset price inflation, and subsequent deflation, stems from the deterioration of banks' balance sheets, which would translate into a stiffening of monetary policy transmission mechanisms, i.e. greater inertia in the lending rates applied by banks to borrowers in relation to market rates.

To test this idea, we used the individual data from the surveys conducted by the Bank of France among bank branches to measure the cost of credit. Figures are available for the lending rate and loan size. An econometric equation for each type of credit, controlling for the loan size effect and the fixed effects relating to type of bank and area of activity, was estimated up to 1994 to take account of an initial period of falling market rates, and projected thereafter.

The estimated equation is:

$$r_{k,t} = c + \sum_{i=1}^{3} \alpha_i tdir_t + \mu_1 C_k^1 + \mu_2 C_k^2 + \gamma_1 (tdir_t - \overline{tdir}) C_k^1 + \gamma_2 (tdir_t - \overline{tdir}) C_k^2 + \sum \kappa_i I_{i,k} + u_{k,t}$$

where $r_{k,t}$ is the lending rate for observation k in month t (the survey is carried out in January, April, July and October), $tdir_t^i$ is the three-month PIBOR in $t - i$, C_k^1 and C_k^2 are dummy variables for loan size, and the $I_{i,k}$ are dummy variables for fixed effects of industry sector and bank sector. The simulated lending rates (not shown) are on the whole higher than the lending rates observed, which indicates that the passthrough of the fall in market rates to lending rates did not slow down.

Another way of describing this phenomenon is to show the market rate coefficients obtained in the regressions explaining the lending rates over an extended estimation period. These

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[11] Renaud Lacroix contributed to this section, producing the econometric estimations using the model proposed by Rosenwald (1998).

coefficients are $\sum_{i=1}^{3} \hat{\alpha}_i + \hat{\gamma}_1 + \hat{\gamma}_2$ for loans size 2 (see Figure 4). These coefficients might be expected to decrease when the sample incorporates periods of low market rates, as then lending rates come close to the break-even point beyond which fixed costs make it difficult for banks to cut them further. In line with intuition, the coefficients are higher for the largest amounts. The striking result, however, is that the coefficients linking lending rates to market rates have recently increased, while the (not shown) constant coefficients (the $\hat{\mu}_0 + \hat{\mu}_1 + \hat{\mu}_2$ for instance) went down. Lending rates have therefore not been particularly inert in the face of the fall in market rates in 1995-97.

Figure 4

Recursive estimators of the impact of market rates on lending rates
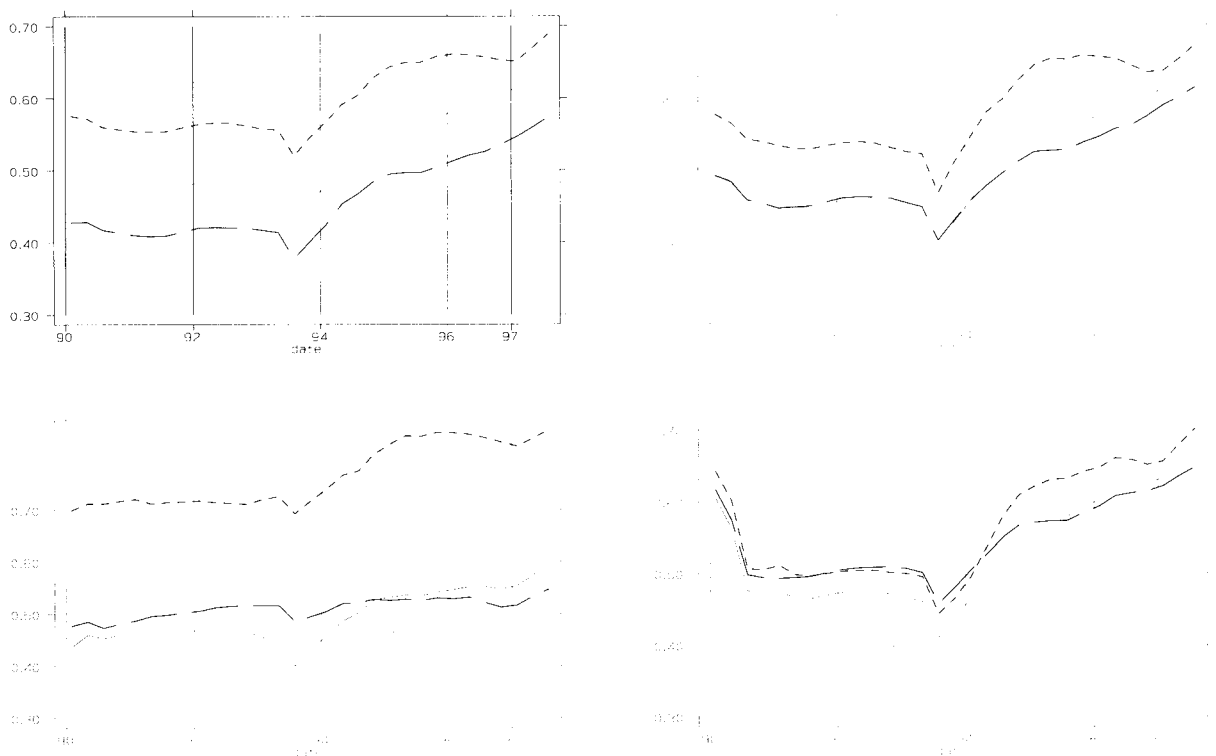
Note: Dotted line for the largest size loans, dashed lines for the smallest size loans. Upper graphs for discounts (left) and overdrafts (right), bottom graphs for long-term (left) and short-term (right) loans.

5.   Should the monetary authorities react to asset price movements?

Most central banks today set themselves a final objective of *price stability*, defined on the basis of current inflation indicators (consumer price indices or national income deflators). The decoupling observed in many countries during the second half of the 1980s between the usual price indicators and asset prices (financial or property), however marked it may have been, has, fundamentally, changed nothing in this respect, despite the fact that, in their communications with the markets and the general public, the monetary authorities today appear more attentive to developments in asset markets (cf. Mr. Greenspan's statements on the "irrational exuberance" of the stock market,

the references to the yield curve in the presentation of monetary objectives in France or in Germany, etc.).

This relative indifference of the monetary authorities to the, at times, erratic movements of asset prices can be justified in theory: assuming efficient markets, the indices of goods and services prices, provided that they are correctly weighted and reflect the whole range of goods and services prices, must embody all the information available on the future course of asset prices. Conversely, the latter must reliably foreshadow the price of the related services: a change in property prices, for example, must faithfully reflect the present values of expected rents over the whole life of the asset. From that standpoint, there are consequently no grounds for doubting the validity of the current inflation index, and hence of the nominal anchor used by central banks.

The problem is that the decoupling of indicators of goods and services prices from asset prices may temporarily assume such proportions as to lead to a rejection of the assumption of market efficiency and the homogeneity of price indicators; it must then be admitted that the formation of "speculative bubbles" on certain asset markets reflects a dynamic inherent in these markets, disruptions in which may distort the allocation of resources, amplify the real cycle via the debt channel and finally jam the transmission mechanisms of monetary policy to such an extent as to dangerously reduce its effectiveness. Confronted with such a scenario, a central bank naturally cannot maintain an attitude of benign neglect but must answer three sets of questions:

(i)   *What are the available and reliable indicators for movements in asset prices* and in what respect can they cast new light on demand, activity and the maintenance of price stability? First it may be observed that the statistical information is generally of poor quality, in particular as far as real estate is concerned. Its partial character makes it rather inappropriate for constructing composite indicators.[12] This may at least partly explain the dearth of empirical work on the topic, its rather heterogeneous character, the uncertain or inconclusive nature of its results and, perhaps even more so, the difficulty of making international comparisons. As part of their main mission of maintaining price stability, the central banks must therefore remedy the current deficiency of statistical information.

(ii)   *In what respect can monetary policy be held responsible for the temporary disruptions observed on the asset markets?* Borio et al. (1994), for example, reveal that credit contributed significantly to the sharp rise in asset prices as from the mid-1980s in a number of countries, including France. In the case of France, this is related to the introduction of a new monetary control regime (lifting credit ceilings and adoption of indirect procedures of liquidity management through the control of interest rates), without, however, it being possible to infer any causality from this: econometric tests would probably not confirm any overall relationship between lending and asset prices as the total of outstanding loans has stagnated since 1991 while equity prices have continued to rise. Statistics, nevertheless, suggest a relationship between certain categories of credit and the boom in prices on specific asset markets. These observations illustrate that, in the context of a monetary policy of indirect control via interest rates, central banks naturally lack the instruments needed to counter a disruption occurring on a specific market, such as the commercial property market. A matter of concern is that if this disruption results in a serious deterioration in the balance sheets of financial intermediaries, it makes them a priori less likely to react to monetary policy impulses. In the case of France, however, the econometric test results (see above) do not seem to validate this perception, as the setting of lending rates by credit institutions has not been significantly affected overall.

To conclude on this point, it is clear that this is where monetary and prudential policies intersect. The prudential authorities today appear more equal to the task of preventing excessive sectoral risks; in this respect, the close links that they may maintain with the central banks and

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[12] The Bank of France is developing a composite asset price index in order to test the validity of a specific monetary policy transmission channel (Grunspan (1997)).

the common view they share cannot but foster the convergence of these microeconomic concerns and the objective of long-term monetary stability.

(iii) *What lessons can the central banks draw from this when formulating their targeting policies?* There can obviously be no question of defining a target in asset price terms. Apart from the problem of the availability and selection of a relevant indicator, a central bank adopting such a strategy would be confronted with two major difficulties: on the one hand, there is no reason why the lags with which asset prices and the prices of goods and services are affected, just as the necessary mix of interest rate changes, should be identical; thus, to effectively counteract the emergence of a speculative bubble, the central bank could be driven to operate large scale (and perhaps pro-cyclical) moves of its interest rate at the risk of seriously affecting activity, or endangering its final objective of price stability. On the other hand, it would be very difficult for a central bank to explain to the markets and the public why it had to tighten its interest rate policy in response to a rise in asset prices at the very time when all the usual inflation indicators were converging towards disinflation, or even below the upper bound of its target range, if any.

Thus, failing a change in the formulation of monetary policy objectives, the priority should be given to improving our knowledge of the links between asset prices and the financial indicators monitored by the central banks with a view to further reinforcing the preventive character of monetary policies.

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